

**156 TILLARY STREET
BROOKLYN, NEW YORK**

**Remedial Action Work Plan &
STIP LIST (10/23/2014)**

**NYC VCP Number: 15CVCP030K
NYC OER Project Number 14EH-N486K**

Prepared for:

Brooklyn LW Associates, L.P.
8100 E 22nd Street #500
Wichita, KS 67226

Prepared by:

URS Corporation
1 Penn Plaza
New York, New York 10119
212-736-4444

OCTOBER 2014



October 23, 2014

New York City Office of Environmental Remediation
City Voluntary Cleanup Program
c/o Shaminder Chawla
100 Gold Street, 2nd Floor
New York, NY 10038

Re: VCP # 15CVCP030K
E-Designation # 14EH-N486K
156 Tillary Street, Brooklyn, NY 11201
Remedial Action Work Plan (RAWP) Stipulation List

Dear Mr. Chawla:

URS Corporation (URS) hereby submits a Remedial Action Work Plan (RAWP) Stipulation List for the Site to the New York City Office of Environmental Remediation (OER) on behalf of Brooklyn LW Hotel Associates, L.P. This letter serves as an addendum to the RAWP to stipulate additional content, requirements, and procedures that will be followed during the site remediation. The contents of this list are added to the RAWP and will supersede the content in the RAWP where there is a conflict in purpose or intent. The additional requirements/procedures include the following Stipulation List below:

1. The criterion attached in **Appendix 1** will be utilized if additional petroleum containing tank or vessel is identified during the remedial action or subsequent redevelopment excavation activities. All petroleum spills will be reported to the NYSDEC hotline as required by applicable laws and regulations. This contingency plan is designed for heating oil tanks and other small or moderately sized storage vessels. If larger tanks, such as gasoline storage tanks are identified, OER will be notified before this criterion is utilized.
2. A pre-construction meeting is required prior to start of remedial excavation work at the site. A pre-construction meeting will be held at the site and will be attended by OER, the developer or developer representative, the consultant, excavation/general contractor, and if applicable, the soil broker.
3. A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. Documentation specified in the RAWP - Appendix 3 - Section 1.6 "Materials Disposal Off-Site" will be provided to OER. If a different disposal facility for the soil/fill material is selected, OER will be notified immediately.
4. Signage for the project will include a sturdy placard mounted in a publically accessible right of way to building and other permits signage will consist of the NYC VCP

Information Sheet (attached **Appendix 2**) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.

5. In the event that hazardous waste is identified during the remedial action or subsequent redevelopment excavation activities at this NYC VCP project, and removal and transportation of hazardous waste becomes necessary, the project may be subject to the New York State Department of Environmental Conservation's Special Assessment Tax (ECL 27-0923) and Hazardous Waste Regulatory Fees (ECL 72-00402). See DEC's website for more information: <http://www.dec.ny.gov/chemical/9099.html>.
6. OER requires parties seeking City Brownfield Incentive Grants to carry insurance. For a cleanup grant, both the excavator and the trucking firm(s) that handle removal of soil must carry or be covered under a commercial general liability (CGL) policy that provides \$1 million per claim in coverage. OER recommends that excavators and truckers also carry contractors pollution liability (CPL) coverage, also providing \$1 million per claim in coverage. The CGL policy, and the CPL policy if obtained, must name the City of New York, the NYC Economic Development Corporation, and Brownfield Redevelopment Solutions as additional insured. For an investigation grant, an environmental consultant must be a qualified vendor in the BIG program and carry \$1 million of professional liability (PL) coverage. A fact sheet regarding insurance is attached as **Appendix 3**.
7. Daily reports will be provided during active excavation work. If no work is performed for extended time period, daily report frequency will be reduced to weekly basis. Daily report template is attached in **Appendix 4**.
8. An engineered composite site cover will be placed over the entire footprint of the Site. The composite cover system will be comprised of concrete foundation/slabs. Drawings of the composite site cover are provided as **Appendix 5**.
9. Installation of 3 permanent wells, 1 up-gradient and 2 down-gradient (down to at least 34 feet below grade) after excavation is complete to monitor groundwater quality. Locations of the wells are presented in **Appendix 6**.

Sincerely,



Robert Wolff
Principal Environmental Scientist

Cc: Sarah Pong, NYCOER

Appendix 1

Generic Procedures for Management of Underground Storage Tanks Identified under the NYC VCP

Prior to Tank removal, the following procedures should be followed:

- Remove all fluid to its lowest draw-off point.
- Drain and flush piping into the tank.
- Vacuum out the “tank bottom” consisting of water product and sludge.
- Dig down to the top of the tank and expose the upper half.
- Remove the fill tube and disconnect the fill, gauge, product, vent lines and pumps. Cap and plug open ends of lines.
- Temporarily plug all tank openings, complete the excavation, remove the tank and place it in a secure location.
- Render the tank safe and check the tank atmosphere to ensure that petroleum vapors have been satisfactorily purged from the tank.
- Clean tank or remove to storage yard for cleaning.
- If the tank is to be moved, it must be transported by licensed waste transporter. Plug and cap all holes prior to transport leaving a 1/8 inch vent hole located at the top of the tank during transport.
- After cleaning, the tank must be made acceptable for disposal at a scrap yard, cleaning the tanks interior with a high pressure rinse and cutting the tank in several pieces.

During the tank and pipe line removal, the following field observations should be made and recorded:

- A description and photographic documentation of the tank and pipe line condition (pitting, holes, staining, leak points, evidence of repairs, etc.).
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with a calibrated photoionization detector (PID).

Impacted Soil Excavation Methods

The excavation of the impacted soil will be performed following the removal of the existing tanks. Soil excavation will be performed in accordance with the procedures described under Section 5.5 of Draft DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with calibrated photoionization detector (PID).

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as indentified through physical examination (PID response, odor, staining, etc.). Collection of verification samples will be performed to evaluate the success of the removal action as specified in this document.

The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan.

- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated.
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile, or dispose of, separate from the impacted soil.
- If additional UST's are discovered, the NYSDEC will be notified and the best course of action to remove the structure should be determined in the field. This may involve the continued trenching around the perimeter to minimize its disturbance.
- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc.) an attempt will be made to remove it, to the extent not limited by the site boundaries or the bedrock surface. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separated dedicated plastic sheeting or live loaded into trucks from the disposal facility. Removal of the impacted soils will continue until visibly clean material is encountered and monitoring instruments indicate that no contaminants are present.
- Excavated soils which are temporarily stockpiled on-site will be covered with tarp material while disposal options are determined. Tarp will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property.

Once the site representative and regulatory personnel are satisfied with the removal effort, verification of confirmatory samples will be collected from the excavation in accordance with DER-10.

Appendix 2
NYC VCP Signage



NYC Voluntary Cleanup Program

**156 Tillary Street
Site #: 15CVCP030K**

This property is enrolled in the New York City Voluntary Cleanup Program for environmental remediation. This is a voluntary program administered by the NYC Office of Environmental Remediation.

Or scan with smart phone:

For more information,
log on to: www.nyc.gov/oer



If you have questions or would like more information,
please contact:

Shaminder Chawla at (212) 442-3007
or email us at brownfields@cityhall.nyc.gov

Appendix 3
BIG Program Insurance Fact Sheet

FACT SHEET – BIG PROGRAM INSURANCE REQUIREMENTS

Investigation Grants – for a developer or site owner to be eligible for a BIG investigation grant, its environmental consultant(s) must be:

- a Qualified Vendor in the BIG Program; and
- maintain Professional Liability (PL) insurance of \$1M per claim and annual aggregate.

Cleanup Grants – for a developer or site owner to be eligible for a BIG cleanup grant:

- Its general contractor or excavation/foundation contractor hired to perform remedial work must maintain Commercial General Liability (CGL) insurance of at least \$1M per occurrence and \$2M in the general aggregate. It is recommended that the general contractor or excavation/foundation contractor also maintain a Contractors Pollution Liability policy (CPL) of at least \$1M per occurrence.
- Its subcontractors who are hired by the general contractor etc. to perform remedial work at a site, including soil brokers and truckers, must also maintain a CGL policy in the amount and with the terms set forth above. It is recommended that subcontractors also maintain a CPL policy in the amount and with the terms set forth above.

The CGL policy, and the CPL policy if in force, must list the city, EDC and BRS as additional insureds, include completed operations coverage and be primary and non-contributory to any other insurance the additional insureds may have.

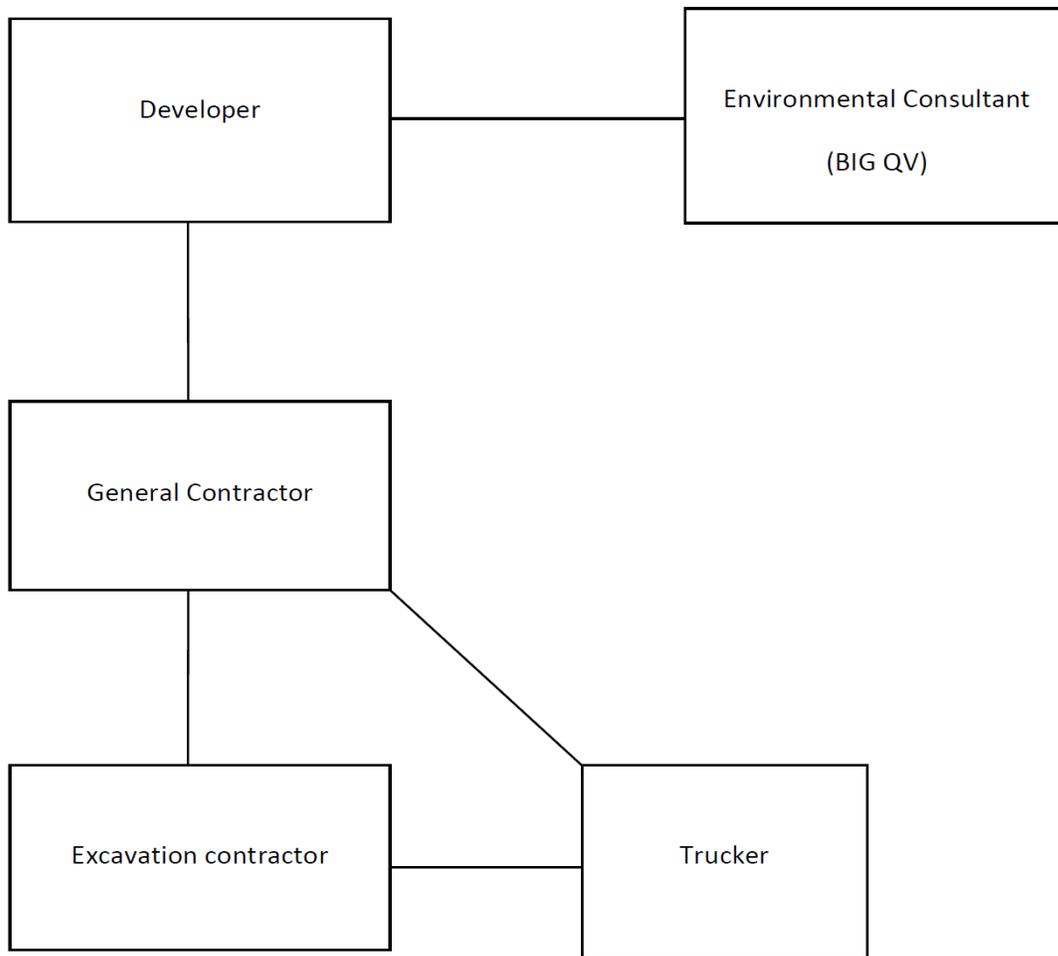
- Its environmental consultant(s) hired to oversee the cleanup must be:
 - a. a BIG Qualified Vendor; and
 - b. maintain Professional Liability (PL) insurance of \$1M per claim and annual aggregate.

If, in the alternative, the developer hires its environmental consultant to perform the cleanup, the environmental consultant must maintain CGL insurance in the amount and with the terms set forth above. It is recommended that the environmental consultant also maintain CPL coverage in the amount and with the terms set forth in the first two bulleted items listed above.

A schematic presenting the contractual relationships described above appears on page 2. Parties who must be named as Additional Insureds on Cleanup Grant insurance policies (CGL and CPL) are presented on page 3.

Example of Contractual Relationships for Cleanup Work

The Office of Environmental Remediation’s Voluntary Cleanup Plan program requires applicants to identify the parties who are engaged in active remediation of their sites including: the General Contractor hired to remediate and/or the excavation contractor hired to excavate soil from the site and the trucking firm(s) that remove soil from the site for disposal at approved facilit(ies).



The chart above shows contractual relationships that typically exist for projects that are enrolled in the Voluntary Cleanup Program.

BIG Program Additional Insureds

The full names and addresses of the additional insureds required under the Required CGL Policy and recommended CPL Policy are as follows:

“City and its officials and employees”

New York City Mayor’s Office of Environmental Remediation
253 Broadway, 14th Floor
New York, NY 10007

“NYC EDC and its officials and employees”

New York City Economic Development Corporation
110 William Street
New York, NY 10038

“BIG Grant Administrator and its officials and employees”

Brownfield Redevelopment Solutions, Inc.
739 Stokes Road, Units A & B
Medford, NJ 08055

Appendix 4
Daily Report Template

Generic Template for Daily Status Report

Instructions

The Daily Status Report submitted to OER should adhere to the following conventions:

- Remove this cover sheet prior to editing.
- Remove all the **red text** and replace with site-specific information.
- Submit the final version as a Word or PDF file.

Daily Status Reports

Daily status reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

DAILY STATUS REPORT

Prepared By: Enter Your Name Here

WEATHER	Snow		Rain		Overcast		Partly Cloudy	X	Bright Sun	
TEMP.	< 32		32-50		50-70	X	70-85		>85	

VCP Project No.:	14CVCP000M	E-Number Project No.:	14EHAN000M	Date:	01/01/2014
Project Name:	Name or Address				

Consultant: Person(s) Name and Company Name	Safety Officer: Person(s) Name and Company Name
General Contractor: Person(s) Name and Company Name	Site Manager/ Supervisor: Person(s) Name and Company Name

Work Activities Performed (Since Last Report):
Provide details about the work activities performed.

Working In Grid #: A1, B1, C1

Samples Collected (Since Last Report):
No samples collected or provide details

Air Monitoring (Since Last Report):
No air monitoring performed or provide details

Problems Encountered:
No problems encountered or provide details

Planned Activities for the Next Day/ Week:
Provide details about the work activities planned for the next day/ week.

									Example:	
Facility # Name/ Location Type of Waste Solid <u>Or</u> Liquid	Facility # Name Location Type of Waste Solid <u>Or</u> Liquid		##### Clean Earth Carteret, NJ petroleum soils Solid							
(Trucks, Cu.Yds. <u>Or</u> Gallons)	Trucks	Cu. Yds. <u>Or</u> Gallons	Trucks	Cu. Yds.						
Today									5	120
Total									25	600

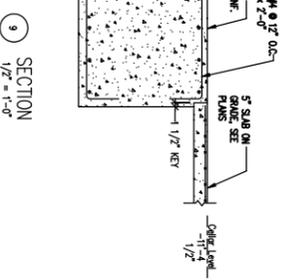
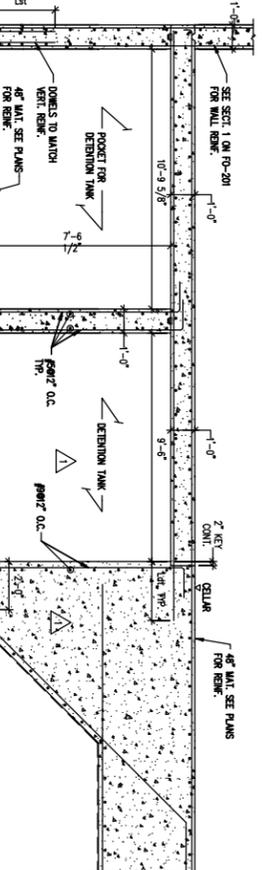
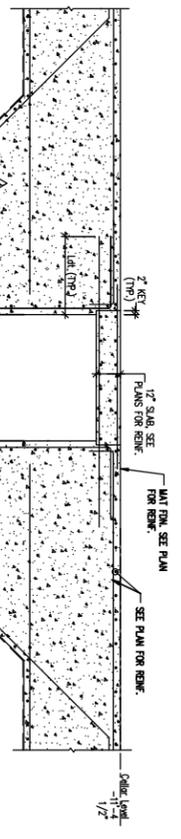
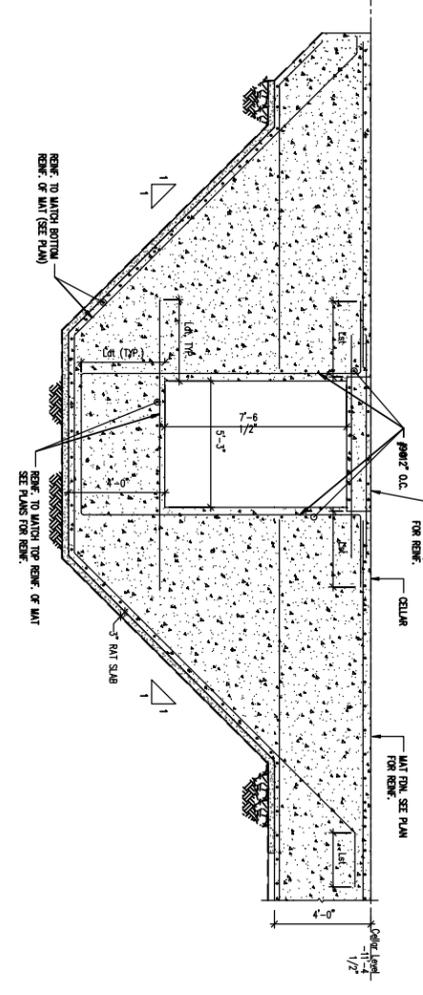
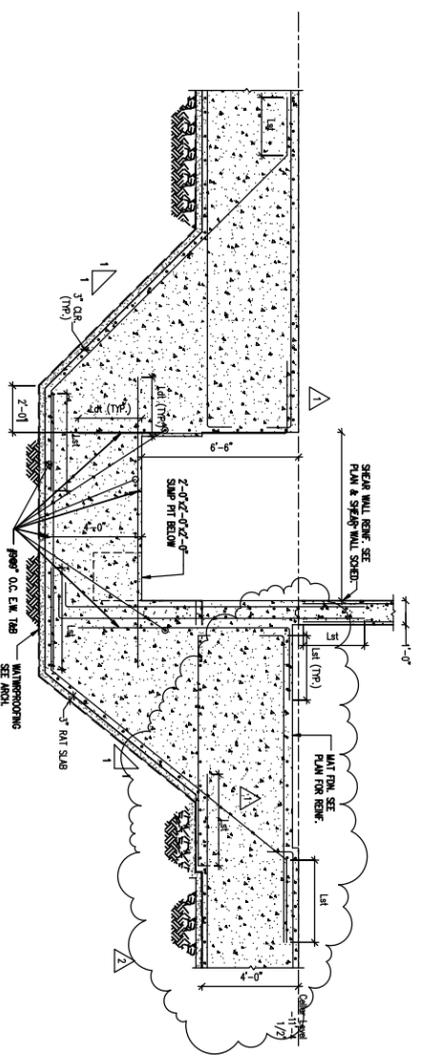
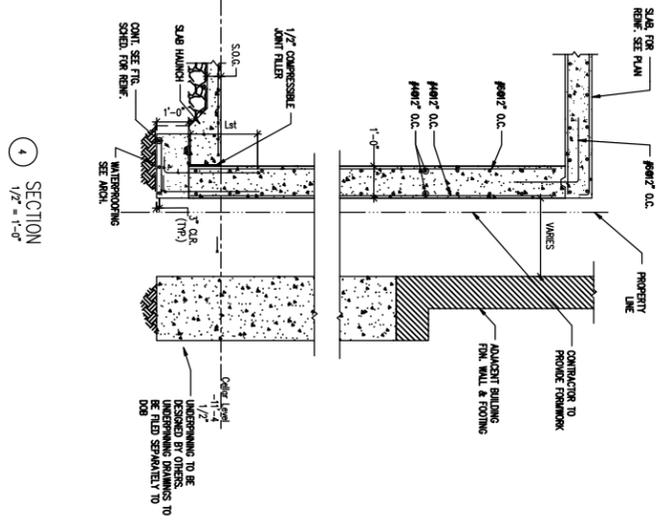
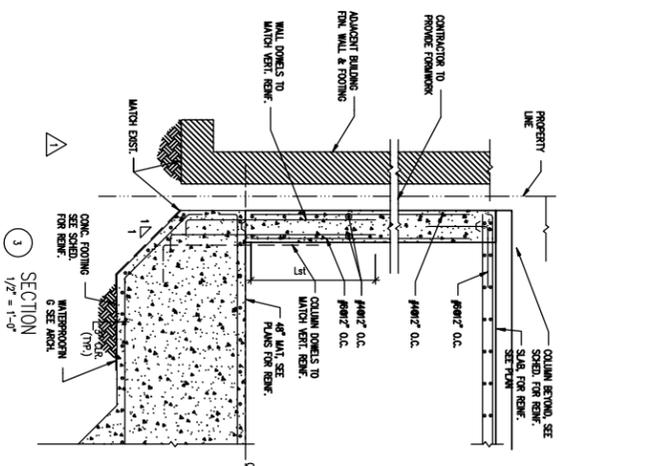
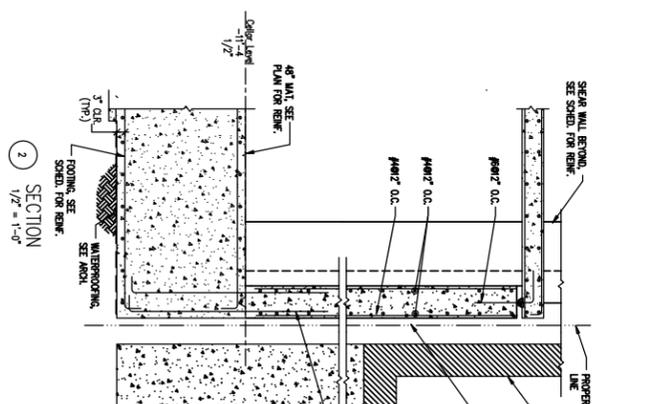
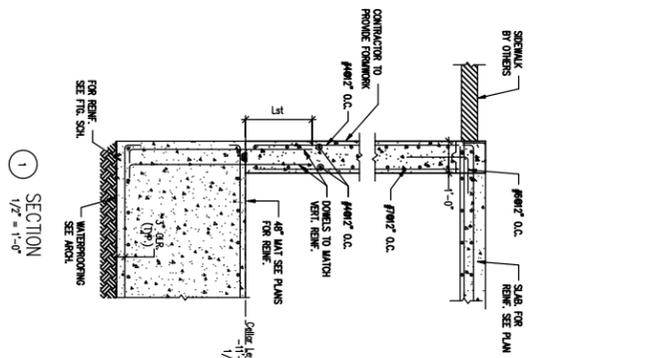
NYC Clean Soil Bank		Receiving Facility: Name/ Address (Approved by OER)			
Tracking No.:	13CCSB000				
Today	Trucks 5	Cu. Yds. 25	Total	Trucks 120	Cu. Yds. 600

Site Grid Map
 Insert the site grid map here

Photo Log

Photo 1 – provide a caption	Insert Photo Here – Photo of the entire site
Photo 2 – provide a caption	Insert Photo Here – Photo of the work activities performed
Photo 3 – provide a caption	Insert Photo Here – Photo of the work activities performed

Appendix 5
Composite Site Cover



SECTION 5
3/8" = 1'-0"

SECTION 6
3/8" = 1'-0"

SECTION 7
3/8" = 1'-0"

SECTION 8
3/8" = 1'-0"

SECTION 9
1/2" = 1'-0"

NOTE:
1. FOR BALANCE SEE SECTION 5 ON FO-201.

NOTE:
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NOTE:
1. FOR BALANCE SEE SECTION 5 ON FO-201.

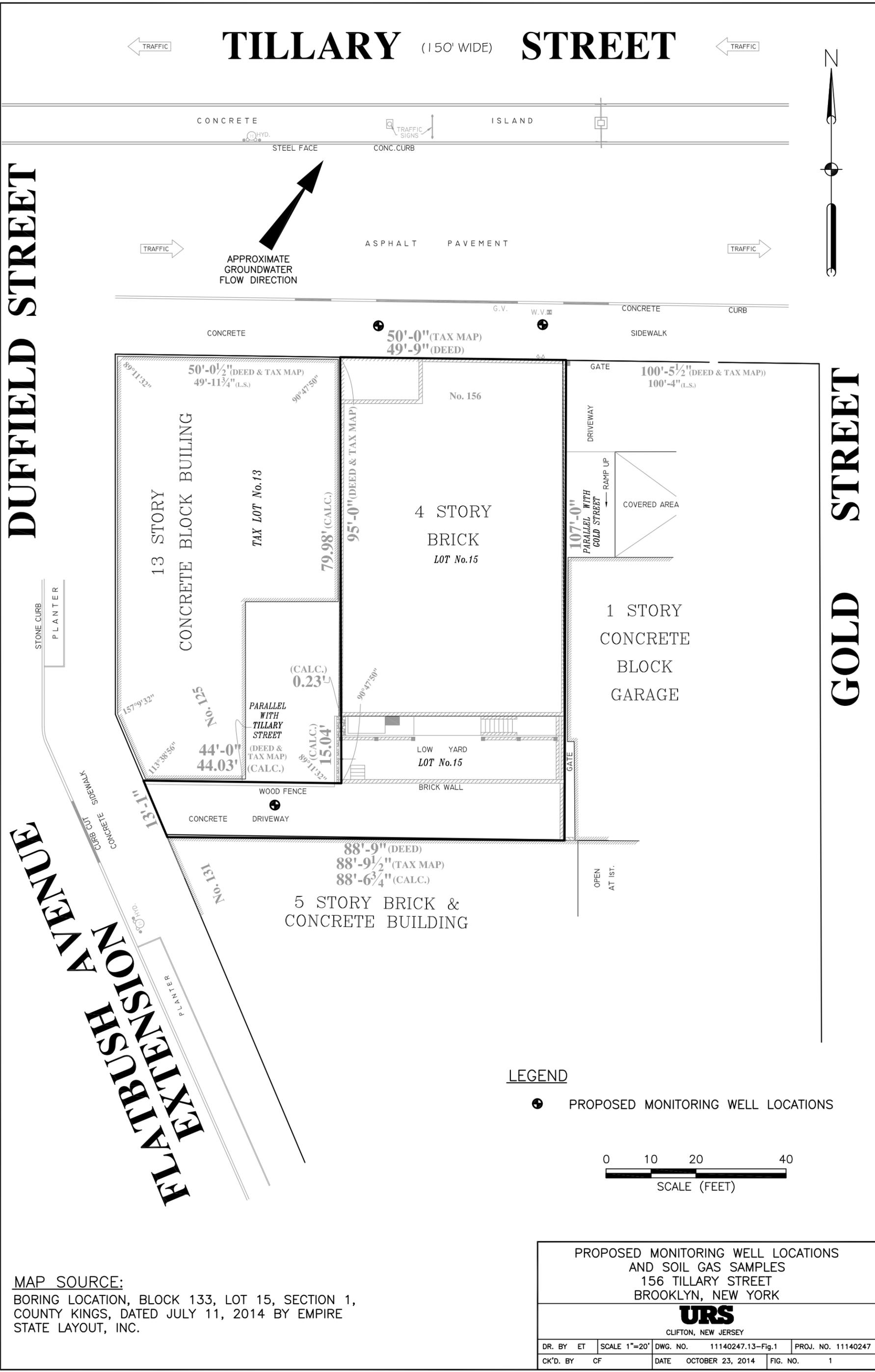
MAP SOURCE:
FOUNDATION SECTIONS, DRAWING FO-201.00
BY STONEHILL & TAYLOR, LAST REVISED
9-30-2014.

SITE WIDE COVER SYSTEM DETAILS
156 TILLARY STREET
BROOKLYN, NEW YORK

CAUTION, NEW JERSEY		URSA	
DR. BY	ET	SCALE	N.T.S.
CF		DWG. NO.	11140247-12-Fig. 8
		PROJ. NO.	11140247
DATE	OCTOBER 23, 2014	FIG. NO.	8

Appendix 6
Locations of Permanent Monitoring Wells

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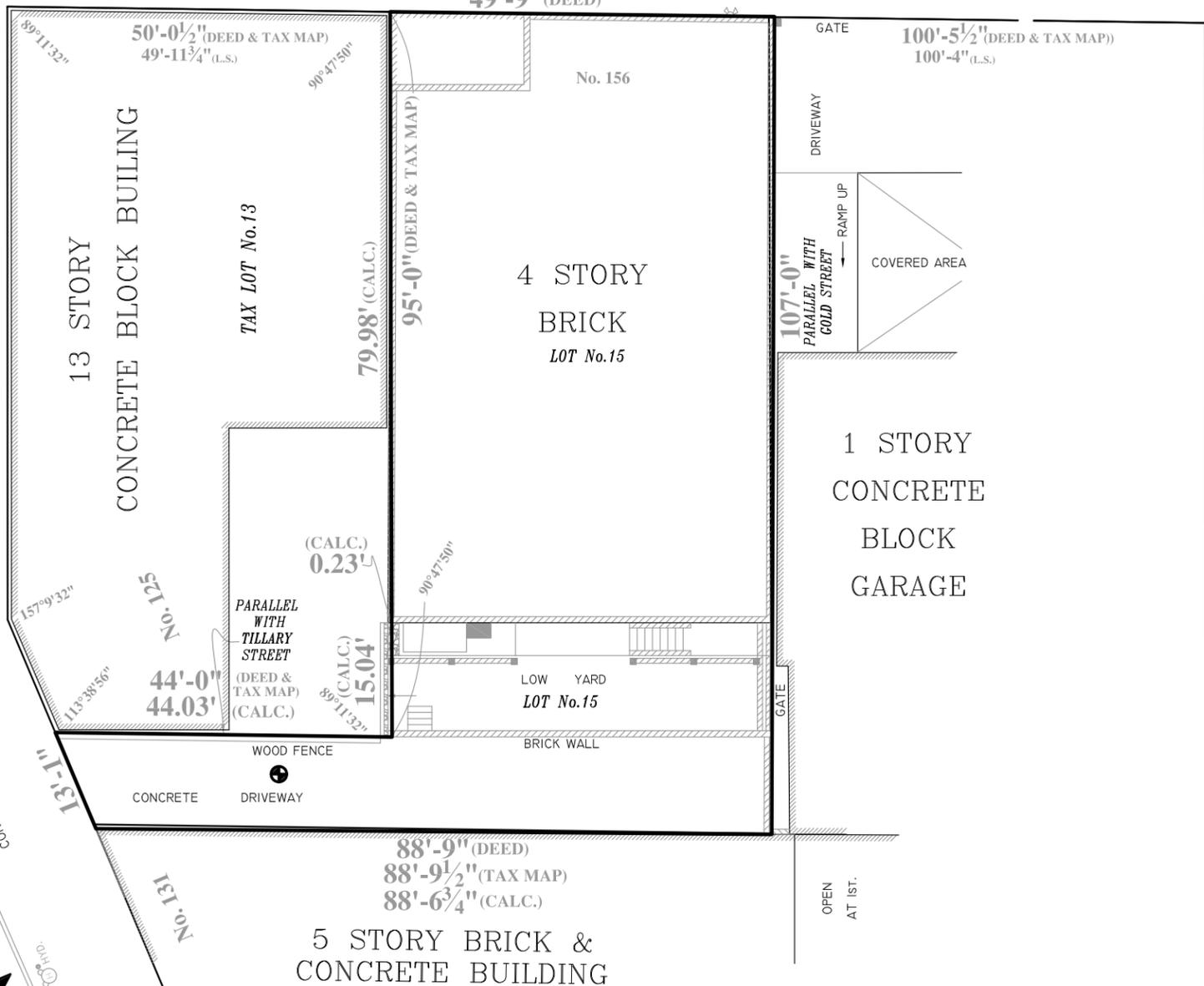
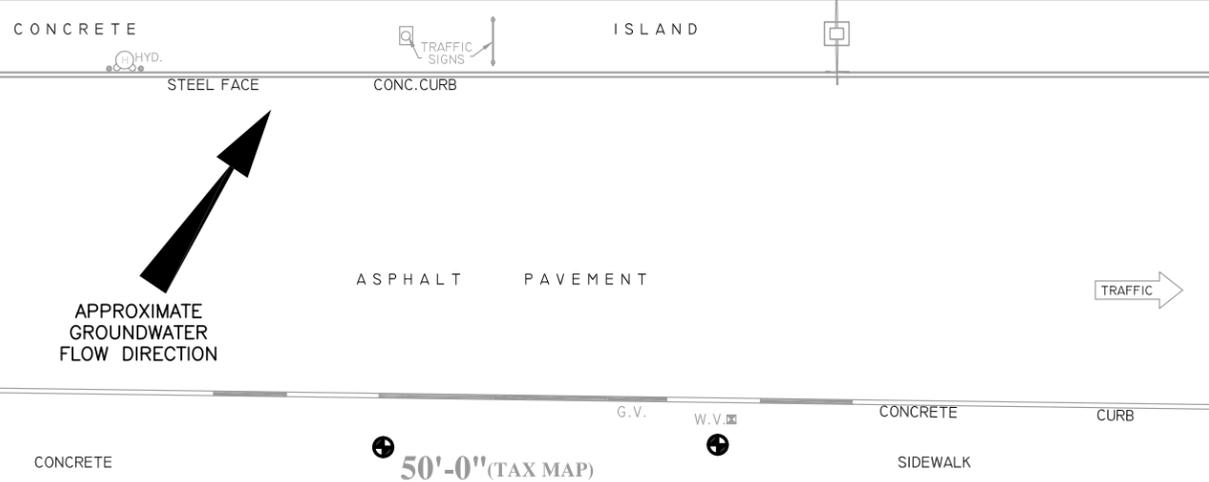
DUFFIELD STREET

FAIRBUSH AVENUE
EXTENSION

TILLARY (150' WIDE) STREET



GOLD STREET



LEGEND

● PROPOSED MONITORING WELL LOCATIONS



MAP SOURCE:
BORING LOCATION, BLOCK 133, LOT 15, SECTION 1,
COUNTY KINGS, DATED JULY 11, 2014 BY EMPIRE
STATE LAYOUT, INC.

PROPOSED MONITORING WELL LOCATIONS
AND SOIL GAS SAMPLES
156 TILLARY STREET
BROOKLYN, NEW YORK



CLIFTON, NEW JERSEY

DR. BY ET	SCALE 1"=20'	DWG. NO. 11140247.13-Fig.1	PROJ. NO. 11140247
CK'D. BY CF	DATE OCTOBER 23, 2014	FIG. NO. 1	

**156 TILLARY STREET
BROOKLYN, NEW YORK**

Remedial Action Work Plan

**NYC VCP Number: 15CVCP030K
NYC OER Project Number 14EH-N486K**

Prepared for:

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8100 E 22nd Street #500
Wichita, KS 67226

Prepared by:

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New York, New York 10119
212-736-4444

OCTOBER 2014

REMEDIAL ACTION WORK PLAN

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4. Construction Health and Safety Plan
5. Vapor Barrier Specifications
6. Foundation Section Detail – Site Wide Cover System

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer

PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Thomas Thomann, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 156 Tillary Street Site NYC OER Project Numbers 15CVCP030K and 14EH-N486K.

I, Robert Wolff am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 156 Tillary Street Site NYC OER Project Numbers 15CVCP030K and 14EH-N486K.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

THOMAS G. THOMANN

Name

078732-1

NYS PE License Number

[Signature]

Signature

10/15/14

Date



Robert Wolff

QEP Name

[Signature]

QEP Signature

10/14/14

Date

EXECUTIVE SUMMARY

Brooklyn LW Hotel Associates, L.P has enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a fifty-eight hundred-square foot site located at 156 Tillary Street in Brooklyn, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 156 Tillary Street in the downtown section of Brooklyn, New York and is identified as Block 133 and Lot 15 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 5,831-square feet and is bounded by Tillary Street to the north, a newly constructed 13-story hotel to the west, a five-story brick and concrete building to the south, and a one-story concrete block garage to the east. A map of the Site boundary is shown in Figure 2. Currently, the Site houses a four-story vacant brick building (scheduled for demolition in late summer 2014). A small alley with access from Duffield Street (to the west) is present along the southern site boundary.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a 20-story brick masonry building which will be utilized as a hotel. Layout of the proposed site development is presented in Figure 3a through 3c. The current zoning designation is C6-4 which permits a wide range of commercial uses; these properties are typically mapped within the city's major business districts. The proposed use is consistent with existing zoning for the property. Currently, the Site houses a vacant four-story brick masonry building.

The proposed building will have a basement consisting of mechanical rooms for utilities; a large kitchen, two meeting rooms, bathrooms, and a corridor open to the first floor. The first

floor (ground level) will house restaurants, storage areas, and an open air courtyard with restaurant seating. Guest rooms for the hotel begin on the second floor. No landscaped areas are planned at the site.

Excavation activities for the proposed redevelopment will entail excavating the entire site footprint to a minimum of sixteen feet below current grade to allow for the basement slab. Other areas of the site will be excavated to between twenty to twenty-five feet below grade to allow for elevator and stairwell pits.

Summary of Environmental Findings

1. Elevation of the property ranges from thirty-one feet to twenty-six feet.
2. Depth to groundwater ranges from 25 to 27.5 feet at the Site.
3. Groundwater flow is generally southwest to northeast beneath the Site.
4. The stratigraphy of the site, from the surface down, consists of five to fifteen feet of fill underlain by fifteen to twenty feet of gravelly sands.
5. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples showed no PCBs in any of the soil samples. Trace concentrations of several VOCs were noted in seven of the samples; however none exceeded Unrestricted Use SCOs. Several SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) including benz(a)anthracene (max. of 27,000 µg/kg), benzo(a)pyrene (max. of 21,000 µg/kg), benzo(b)fluoranthene (max. of 29,000 µg/kg), benzo(k)fluoranthene (max. of 6,700 µg/kg), chrysene (max. of 22,000 µg/kg), indeno(1,2,3-c,d)pyrene (max. of 10,000 µg/kg) and dibenz(a,h)anthracene (max. of 2,700 µg/kg) were found within three samples exceeding Restricted Residential Use SCOs. The pesticide alpha chlordane (120 µg/kg) was found in one soil sample exceeding Unrestricted Use SCOs. Several metals exceeded Restricted Residential Use SCOs and included: arsenic detected in all samples at maximum of 660 mg/Kg, barium exceeding in two samples at maximum of 630 mg/kg, chromium trivalent exceeding in two samples (max. of 560 mg/kg), copper exceeding in three samples (max. of 1,200

mg/kg), lead exceeding in three samples (max. of 1,200 mg/kg), and mercury exceeding in eight samples (max. of 170 mg/kg).

6. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples showed no PCBs or pesticides in any sample. Several VOCs were detected at trace concentrations and below their GQS. Six SVOCs including 1,1'-biphenyl (32 µg/L), acenaphthene (32 µg/L), benz(a)anthracene (3.9 µg/L), bis(2-ethylhexyl)phthalate (7.1 µg/L), chrysene (4.7 µg/L), and phenanthrene (94 µg/L) exceeded their GQS in one sample. Several metals were identified and only arsenic, selenium, and sodium exceeded their respective GQS in all four samples. Arsenic exceeded GQS of 25 ug/L in all samples ranging from 450 ug/L to 1,400 ug/L.
7. Soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Total concentrations of petroleum-related VOCs (BTEX) ranged from 69.4 µg/m³ – 97.2 µg/m³. Chlorinated VOCs including TCA was detected at 1.8 µg/m³, Trichloroethylene (TCE) was detected at 12.9 µg/m³, and Tetrachloroethylene (PCE) was detected at between 5.7 µg/m³ and 43 µg/m³. The concentration of TCE is within the monitoring guidance matrix established by NYSDOH.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the entire Site will be excavated to a depth of at least 16 feet for the building's new cellar level. A small portion of the property will be excavated to at least 20 feet for the elevator pit and water tanks. Approximately, 2500 tons of soil will be excavated and removed from this Site.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (USTs) (if encountered) and closure of petroleum spills (Spill number of existing spill or if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal,

and this plan. Sampling and analysis of excavated media as required by disposal facilities.

11. Collection and analysis of eight end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Installation and operation of an active sub-slab depressurization system. The active SSSDS will consist of three runs of 4" diameter perforated PVC piping installed under the building slab. The piping will be set in a one-foot thick bed of ¾" crushed stone.
14. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade. The vapor barrier will consist of Grace Preprufe 300R/160R which is a 46-mil high density polyethylene (HDPE). The vapor barrier will be installed prior to pouring the building's concrete slab.
15. Construction and maintenance of an engineered composite cover consisting of the 48" thick mat foundation at the tower and 5" thick slab-on grade at the 1-story terrace to prevent human exposure to residual soil/fill remaining under the Site.
16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and

reporting at a specified frequency.

20. The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses. Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment. An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Construction Health and Safety Plan. This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration (OSHA). This plan includes many protective elements including those discussed below.

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the CHASP. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is John Crespo and can be reached at 646-772-9749.

Worker Training. Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan. Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan (CAMP). Results will be regularly reported to the NYC OER. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Gerald Golino at (914) 663-8633 or NYC Office of Environmental Remediation Project Manager Sarah Pong at 212-442-8342.

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be

summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7AM to 3PM Monday through Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Gerald Golino at 914-663-8633, the NYC Office of Environmental Remediation Project Manager Sarah Pong at 212-442-8342, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

Utility Mark-outs. To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

Soil and Liquid Disposal. All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held

instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management. Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

Imported Material. All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination. All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping. Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at:

Walt Whitman Public Library

93 Saint Edwards Street

Brooklyn, NY 11205

718-935-0214

10AM – 6 PM

Long-Term Site Management. If long-term protection is required after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Brooklyn LW Hotel Associates, L. P. has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 156 Tillary Street in the downtown section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternative analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 156 Tillary Street in the downtown section of Brooklyn, New York and is identified as Block 133 and Lot 15 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 5,831-square feet and is bounded by Tillary Street to the north, a newly constructed 13-story hotel to the west, a five-story brick and concrete building to the south, and a one-story concrete block garage to the east. A map of the Site boundary is shown in Figure 2. Currently, the Site houses a four-story vacant brick building (scheduled for demolition in late summer 2014). A small alley with access from Duffield Street (to the west) is present along the southern site boundary.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a 20-story brick masonry building which will be utilized as a hotel. Layout of the proposed site development is presented in Figure 3a through 3c. The current zoning designation is C6-4 which permits a wide range of commercial uses; these properties are typically mapped within the city’s major business districts. The

proposed use is consistent with existing zoning for the property. Currently, the Site houses a vacant four-story brick masonry building.

The proposed building will have a basement consisting of mechanical rooms for utilities; a large kitchen, two meeting rooms, bathrooms, and a corridor open to the first floor. The first floor (ground level) will house restaurants, storage areas, and an open air courtyard with restaurant seating. Guest rooms for the hotel begin on the second floor. No landscaped areas are planned at the site.

Excavation activities for the proposed redevelopment will entail excavating the entire site footprint to a minimum of sixteen feet below current grade to allow for the basement slab. Other areas of the site will be excavated to between twenty to twenty-five feet below grade to allow for elevator and stairwell pits. The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

Based on a review of the NYC SPEED application as well as the NYC Zoning and Land Use GIS database, the neighborhood in the vicinity of the Site is predominantly mixed commercial/residential with recent redevelopment. There is a high school located 400 feet west across Flatbush Avenue. There are no hospitals or day care facilities within a 500-foot radius of the Site.

Figure 4 displays the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Remedial Investigation Report, 156 Tillary Street*”, dated August, 2014 (RIR).

Summary of Past Uses of Site and Areas of Concern

URS conducted a Phase I Environmental Site Assessment (ESA) of the property at 156 Tillary Street in December 2012. According to the records reviewed at the time, the subject property had been vacant for at least the past twenty years. Prior to that, the Site was used as a furniture storage warehouse and as the “Manhattan Drug Company.” It was not clear during the

records review whether the Site was used to manufacture pharmaceuticals or to store them. The historical site use as a “drug company” was considered a REC.

Summary of the Work Performed under the Remedial Investigation

URS performed the following scope of work in May of 2014:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the entire project Site, and collected fifteen soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected three groundwater samples and one blind duplicate sample for chemical analysis to evaluate groundwater quality;
4. Installed three soil vapor probes through the existing basement floor and collected three samples and one outdoor ambient air sample for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from thirty-one feet to twenty-six feet.
2. Depth to groundwater ranges from 25 to 27.5 feet at the Site.
3. Groundwater flow is generally southwest to northeast beneath the Site.
4. The stratigraphy of the site, from the surface down, consists of five to fifteen feet of fill underlain by fifteen to twenty feet of gravelly sands.
5. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples showed no PCBs in any of the soil samples. Trace concentrations of several VOCs were noted in seven of the samples; however none exceeded Unrestricted Use SCOs. Several SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) including benz(a)anthracene (max. of 27,000 µg/kg), benzo(a)pyrene (max. of 21,000 µg/kg), benzo(b)fluoranthene (max. of 29,000 µg/kg), benzo(k)fluoranthene (max. of 6,700 µg/kg), chrysene (max. of 22,000 µg/kg),

indeno(1,2,3-c,d)pyrene (max. of 10,000 µg/kg) and dibenz(a,h)anthracene (max. of 2,700 µg/kg) were found within three samples exceeding Restricted Residential Use SCOs. The pesticide alpha chlordane (120 µg/kg) was found in one soil sample exceeding Unrestricted Use SCOs. Several metals exceeded Restricted Residential Use SCOs and included: arsenic detected in all samples at maximum of 660 mg/Kg, barium exceeding in two samples at maximum of 630 mg/kg, chromium trivalent exceeding in two samples (max. of 560 mg/kg), copper exceeding in three samples (max. of 1,200 mg/kg), lead exceeding in three samples (max. of 1,200 mg/kg), and mercury exceeding in eight samples (max. of 170 mg/kg).

6. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples showed no PCBs or pesticides in any sample. Several VOCs were detected at trace concentrations and below their GQS. Six SVOCs including 1,1'-biphenyl (32 µg/L), acenaphthene (32 µg/L), benz(a)anthracene (3.9 µg/L), bis(2-ethylhexyl)phthalate (7.1 µg/L), chrysene (4.7 µg/L), and phenanthrene (94 µg/L) exceeded their GQS in one sample. Several metals were identified and only arsenic, selenium, and sodium exceeded their respective GQS in all four samples. Arsenic exceeded GQS of 25 ug/L in all samples ranging from 450 ug/L to 1,400 ug/L.
7. Soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Total concentrations of petroleum-related VOCs (BTEX) ranged from 69.4 µg/m³ – 97.2 µg/m³. Chlorinated VOCs including TCA was detected at 1.8 µg/m³, Trichloroethylene (TCE) was detected at 12.9 µg/m³, and Tetrachloroethylene (PCE) was detected at between 5.7 µg/m³ and 43 µg/m³. The concentration of TCE is within the monitoring guidance matrix established by NYSDOH.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

2.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

Groundwater

- Remove contaminant sources causing impact to groundwater.
- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

Soil

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process under is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Land use; and
- Sustainability.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

Remedial Alternative #1 involves:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs has been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of at least twenty feet. If soil/fill containing analytes at

concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs;

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a / waterproofing/ vapor barrier and a sub-slab depressurization system (SSDS) would be installed beneath the basement foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor; and
- Placement of a final cover consisting of building slab and pavements over the entire Site as part of new construction.

Remedial Alternative #2 involves:

- Establishment of Site-Specific (Track 4) SCOs (listed in Section 4.2);
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Excavation for construction of the new building's cellar level will require excavation to a depth of at least sixteen feet below current grade. Other portions of the site including elevator and stairwell pits will be excavated to depths in excess of twenty feet below current grade. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 4 Site-Specific SCOs;
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a soil vapor barrier/waterproofing system beneath the building slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Installation of an active Sub-slab Depressurization System (SSDS);

- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing the historic fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/ fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Vapor barrier and SSDS would mitigate any vapor issues. Implementing Institutional Controls including a Site Management Plan and continued "E" designation would ensure that the composite cover system remains intact and protective.

Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soils/Materials Management Plan and Community Air Monitoring Plan (CAMP). Since groundwater is not anticipated during construction and remediation, dewatering activities will not be required during the Site development. As such, there is minimal risk of contact with groundwater. In future, potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below and an active SSDS.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative #1 would achieve compliance with remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Protection of Groundwater SCOs. Compliance for SCGs for soil vapor would also be achieved by installing a SSDS and a vapor barrier/waterproofing system below the new building's basement slab and continuing the vapor barrier around foundation walls, as part of development.

Alternative #2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would be achieved by installing an active SSDS and a vapor barrier/waterproofing system below the new building's basement slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment

under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-site workers and the surrounding community from exposure to Site-related contaminants.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both Alternative #1 and Alternative #2 have similar short-term effectiveness during their implementations, as each requires excavation of historic fill material. Both alternatives would result in short term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts could potentially be higher for Alternative 1 if excavation of greater amounts of historic fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

Additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

The effects of these potential adverse impacts to the community, workers, and the environment would be minimized through implementation of corresponding control plans including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short-term effectiveness in protecting the surrounding community by decreasing the risk of

contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Construction Health and Safety Plan (CHASP) would be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of Engineering Controls/Institutional Controls (ECs/ICs) that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of ECs.

Alternative #1 would be effective over the long-term by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCOs and providing a permanent cleanup of site soil contamination. Removal of on-Site contaminant sources will prevent future groundwater contamination.

Alternative #2 would also provide long term effectiveness by removing most on-site contamination and attaining Track 4 Site-Specific SCOs) and the proposed site redevelopment providing a composite cover system across the site preventing direct contact exposures to site soil. A vapor barrier and active SSDS will also be utilized to prevent exposure to potential soil vapor intrusion. Additional institutional controls will be put in place including maintaining use restrictions, establishing a Site Management Plan to ensure long-term management of ICs, ECs, and maintaining continued registration as an E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity. Both alternatives would result in removal of soil contamination exceeding their respective SCOs, providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for

contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the remedy.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative #1 will permanently eliminate toxicity, mobility, and volume of contaminants from on-Site soil by excavating and removing all soils that exceed Track 1 Unrestricted Use SCOs.

Alternative #2 will reduce the toxicity and mobility of site contamination by cleaning up the site to Track 4 Site Specific SCOs. The site will be capped via the proposed construction of a twenty-story building which will cover the entire site footprint with a concrete slab. Permanent institutional controls including a site management plan and deed restriction will be established to protect future site workers and/or residents should the need to break the site cap be necessary.

Alternative 1 would eliminate a greater total mass of contaminants on Site. The removal of soil to 16 to 20 feet for the new development in both scenarios would probably result in relatively minor differences between these two alternatives.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations,

administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

Alternative #1 is technically feasible and necessary for the proposed construction of the site. The proposed site building will have a basement that requires the entire site to be excavated to a depth of at least sixteen feet below sidewalk grade thus removing all site soils above Track 1 Unrestricted Use SCOs.

Similarly, Alternative #2 is feasible and necessary for the proposed construction of the site. If post excavation sampling indicates that site soils have been cleaned up to Track 4 Site Specific SCOs, institutional controls will be utilized post construction.

Both remedies can be implemented with techniques, materials, and equipment that are readily available and have been proven effective in remediating the contaminants associated with the Site. They both use standard materials and services that are well established technology. The reliability of each remedy is also high. There are special difficulties associated with any of the activities proposed.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Since historic fill at the Site was found during the RI to only extend to a depth of up to 15 feet below grade, and the new building requires excavation of the entire Site to a depth of 16 feet, the costs associated with both Alternative 1 and Alternative 2 will likely be the comparable. Capital costs will be similar for both Alternative #1 and Alternative #2. Costs associated with Alternative 1 could potentially be higher than Alternative 2 if soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of institutional controls including a Site Management Plan as part of Alternative 2.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial permitting associated with the proposed site development, no adverse community opinion is anticipated for either alternative. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment period will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix 1 Observations here will be supplemented by public comment received on the RAWP.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

Both remedial alternatives will be comparable with the historic and proposed future use of the site and are consistent with current zoning designation for the property. The project site is improved with a building that has reportedly been vacant for over twenty-years. Prior to that, the site was reportedly used for various commercial enterprises. The proposed end use for the property is as a hotel. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. The reasonably anticipated future use of the Site and its surroundings will be documented by the applicant in the NYC VCP application, which will include the following conclusions:

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. The areas surrounding the site are urban and consist of predominantly mixed residential and commercial buildings in zoning districts designated for commercial and residential uses. The development would replace an underutilized site with a modern commercial building. The proposed development would create new employment opportunities, living space, and economic and fiscal benefits to the City and State in the form of economic revitalization and tax revenue.

Temporary short-term project impacts are being mitigated through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site-Specific SCOs, which are appropriate for its planned residential use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area with limited proximity to fish or wildlife. Both alternatives would prevent any potential exposure pathways of contaminant migration affecting fish or wildlife. Municipal water supply wells are not present in this part of City; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources.

Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program may be utilized for reuse of native soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix 2. Both alternatives will be implemented in the same manor and therefore have the same potential to utilize green remediation methods.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 2, the Track 4 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the entire Site will be excavated to a depth of at least 16 feet for the building's new cellar level. A small portion of the property will be excavated to at least 20 feet for the elevator pit and water tanks. Approximately, 2500 tons of soil will be excavated and removed from this Site.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (USTs) (if encountered) and closure of petroleum spills (Spill number of existing spill or if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.
11. Collection and analysis of eight end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Installation and operation of an active sub-slab depressurization system. The active SSDS will consist of three runs of 4" diameter perforated PVC piping installed under the building slab. The piping will be set in a one-foot thick bed of ¾" crushed stone.
14. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade. The vapor barrier will consist of Grace Preprufe 300R/160R which is a 46-mil high density polyethylene (HDPE). The vapor barrier will be installed prior to pouring the building's concrete slab.
15. Construction and maintenance of an engineered composite cover consisting of the 48" thick mat foundation at the tower and 5" thick slab-on grade at the 1-story terrace to prevent human exposure to residual soil/fill remaining under the Site.

16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

20. The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

The SCOs for this Site are listed in the 6NYCRR Part 375, Table 6.8(b) Restricted Residential Use SCOs as amended by the following Site-Specific SCOs.

<u>Contaminant</u>	<u>Track 4 SCOs</u>
Total SVOCs	250 ppm

Arsenic	24 ppm
Lead	1000 ppm
Mercury	3.0 ppm

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 6.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 1,708 cubic yards or 2,562 tons.

The proposed disposal locations for Site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Clean Earth of Philadelphia, Inc.	Historic Fill/Soil	2,562 tons

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Eight confirmation samples will be collected from the base of the excavation at locations shown on Figure 5. For comparison to Track 1 SCOs, analytes will include VOCs, SVOC, pesticides, PCBs and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list (Table 2).

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation end-point sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the

RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for compounds and elements as described above utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

One duplicate soil sample, one field rinse blank, and one trip blank will be collected and submitted to the approved laboratory for analysis of the same parameters for QA/QC purposes during end-point sample collection. If end-point sampling occurs in multiple phases, additional QA/QC samples will be collected and analyzed by the laboratory.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

Dedicated disposable sampling materials will be used for the collection endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected. Decontamination of non-dedicated sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash withalconox® detergent solution and scrub
- Rinse with tap water
- Rinse with distilled or deionized water

Prepare field blanks by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trip blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3 (if necessary).

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 4 Site-Specific SCOs. Engineering Controls are required in the remedial action to address residual contamination remaining at the site. The Site has three elements which constitute the primary Engineering Controls, consisting of:

- composite cover system consisting of a re-enforced concrete slab which will cover the entire site footprint ;
- soil vapor barrier;
- active Sub-Slab Depressurization System (SSDS)

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of 48” thick mat foundation at the tower and 5” thick slab-on grade at the 1-story terrace.

Figure 7 shows the typical design for each remedial cover type used on this Site. Appendix 6 provides a drawing showing cross sectional views of typical foundation construction details. The entire site footprint will be capped with a concrete slab, no landscaping areas are planned.

The composite cover system would serve as a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

Vapor Barrier

Migration of soil vapor from on-Site or off-Site in the future will be mitigated with a combination of the building slab, vapor barrier, and active sub-slab depressurization system. The vapor barrier will consist of Grace Preprufe 300R/160R which is a 46-mil high density polyethylene (HDPE). The vapor barrier will be installed prior to pouring the building’s concrete slab. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls in accordance with manufacturer specifications. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner.

The project’s Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 7. Product specification sheets are included in Appendix 5.

The Remedial Closure Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the

manufacturers certificate of warranty.

Active Sub-Slab Depressurization System

Migration of soil vapor will be mitigated with a combination of the building slab, vapor barrier, and construction of an active SSDS. Figure 7 shows the preliminary specifications and layout for the SSDS. As the proposed building for this site will be connected to the adjacent site (125 Flatbush Ave) which also has an active SSDS, the proposed SSDS for the 156 Tillary Street site will be connected to the 125 Flatbush Avenue site.

The active SSDS will consist of three runs of 4” diameter perforated PVC piping installed under the building slab. The piping will be set in a one-foot thick bed of ¾” crushed stone. Each of the piping runs will connect to a capped Vacuum point threaded through the building wall (where it is sealed with vapor barrier tape). Each vacuum point enables the system pressure to be monitored periodically to determine the system’s functionality. The vacuum gauge will be located on the riser pipe in the basement. The Photohelic Pressure Switch/Gauge with a 0 – 4 inch span will be wired to a red indicator light next to the riser pipe. All piping runs will be connected to a single riser pipe that extends up through the building to vent sub-slab vapor above roof height. A Fantec HP220 Duct Fan will be hardwired in to the system at the top of the riser pipe located above the roof so it can be run actively.

4.4 INSTITUTIONAL CONTROLS

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be established in a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner’s successors and assigns must comply with the approved SMP;

- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for commercial use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 30 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This EA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Based on the results of the Remedial Investigation Report the contaminants of concern found are:

Soil

- SVOCs including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene

were detected at concentrations exceeding Restricted Residential Use SCOs; One pesticide, chlordane exceeding Unrestricted Use SCOs; and

- Metals including arsenic, barium, chromium, copper, lead, and mercury exceeding Restricted Residential Use SCOs.

Groundwater

- SVOCs including 1,1'-biphenyl, acenaphthene, benz(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, and phenanthrene exceeding NYSDEC Groundwater Quality Standards; and
- Several metals were identified but only arsenic, selenium, and sodium exceeded Groundwater Quality Standards.

Soil Vapor

- Chlorinated VOC trichloroethene (TCE) detected above NYS DOH monitoring thresholds
- Petroleum-related hydrocarbons including BTEX were detected at moderate concentrations.

Nature, Extent, Fate and Transport of Contaminants

SVOCs and metals are present in the historic fill materials to depths of 16 feet below grade. Arsenic was detected in the soil across the Site in soil and reported at a concentration within groundwater samples, which would indicate that contamination is mobilizing into groundwater or migrating off-Site. TCE was detected in a soil vapor sample at a concentration above the mitigation threshold established by New York State DOH. However, TCE was not detected in any onsite soil or groundwater.

Potential Routes of Exposure

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more

of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of fill/soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill, soil, or building materials.

Contact with contaminated media will be mitigated by removing the source and/or via engineering controls designed to prevent exposure potential. Site soils will be removed from grade to a minimum depth of sixteen feet below grade and capped by a re-enforced concrete slab and foundation structures preventing direct contact after it is installed. During excavation activities as CAMP will be in place protecting site workers and the surrounding community. Groundwater is a minimum of twenty-five feet below grade (based on observations during the remedial investigation) and is not expected to be encountered during site redevelopment. Groundwater in New York City and the surrounding boroughs is not used as a potable source. Exposure to soil vapor will be mitigated by a vapor barrier and SSDS.

Potential Points of Exposure

Current Conditions: The entire Site is currently capped with concrete, therefore exposure to surficial historic fill is limited. The Site is served by public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential for exposure. There is potential for soil vapor to intrude into the building.

Construction/Remediation Activities: Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils, as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale, or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During the remedial action, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the implementation of the Soil/Materials Management Plan, stormwater pollution prevention, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction

Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 Site-Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and an active SSDS and vapor barrier system will prevent any exposure to potential off-Site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Existence of Human Health Exposure

Human health exposure does not currently exist on the property since direct contact is prevented by the current building and concrete sidewalk. Following demolition and the start of redevelopment the potential will exist for human health exposures during site excavation. A CAMP will be in place during this period so exposures are limited to levels below those which would impact human health for site workers and the surrounding neighborhood. Once site redevelopment has been completed, no exposure potential will remain at the site. A site management plan will be in place to minimize the potential of human health exposures if the ground is broken to repair a utility or potential future site improvement.

Receptor Populations

On-Site Receptors - The Site is currently developed with a 4-story building. The building is vacant and access to Site is restricted by locked doors. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents and visitors.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include: adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) - existing and future
2. Residential Buildings (up to 0.25 mile) - existing and future

3. Building Construction/Renovation (up to 0.25 mile) - existing and future
4. pedestrians, Trespassers, Cyclists (up to 0.25 mile) - existing and future
5. Schools (up to 0.25 mile) - existing and future

Overall Human Health Exposure Assessment

Currently, the site is capped by a building and concrete driveway and no potential complete exposure pathways exist. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. Following demolition of the current building and the start of redevelopment activities, potential exposure to site soils will exist. There is no complete exposure pathway under future conditions after the Site is developed. This assessment takes into consideration the reasonably anticipated use of the Site, which includes a hotel, site-wide impervious surface cover cap, and a subsurface vapor barrier system and active SSDS for the building.

During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as all soil above Track 4 Site Specific SCOs will have been removed and a vapor barrier and SSDS will have been installed as part of development. The vapor barrier system and SSDS will prevent potential vapor intrusion. The composite cover system and use restrictions will prevent contact with residual soil or groundwater and continued protection after the remedial action will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include the Site Safety Officer and field technician John Crespo. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Thomas Thomann and Robert Wolff.

5.2 SITE SECURITY

Site access will be controlled by plywood fencing, gated entrances and exits, and an overnight security guard.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 7AM to 3PM. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be Gerald Golino Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

5.5 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate

monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

5.6 AGENCY APPROVALS

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 SITE PREPARATION

Pre-Construction Meeting

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped

stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is Southeast on Flatbush Avenue toward Atlantic Avenue

- Sharp right onto Pacific Street
- Left on 4th Street
- Right on Prospect Avenue
- Merge onto I-278 W/Brooklyn Queens Expressway/Gowanus Expressway

5.9 DEMOBILIZATION

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 REPORTING AND RECORD KEEPING

Daily Reports

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and

- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation by the NYC Department of Buildings.

- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the project at 156 Tillary Street, Brooklyn, NY NYC VCP Site Number 15CVCP030K..

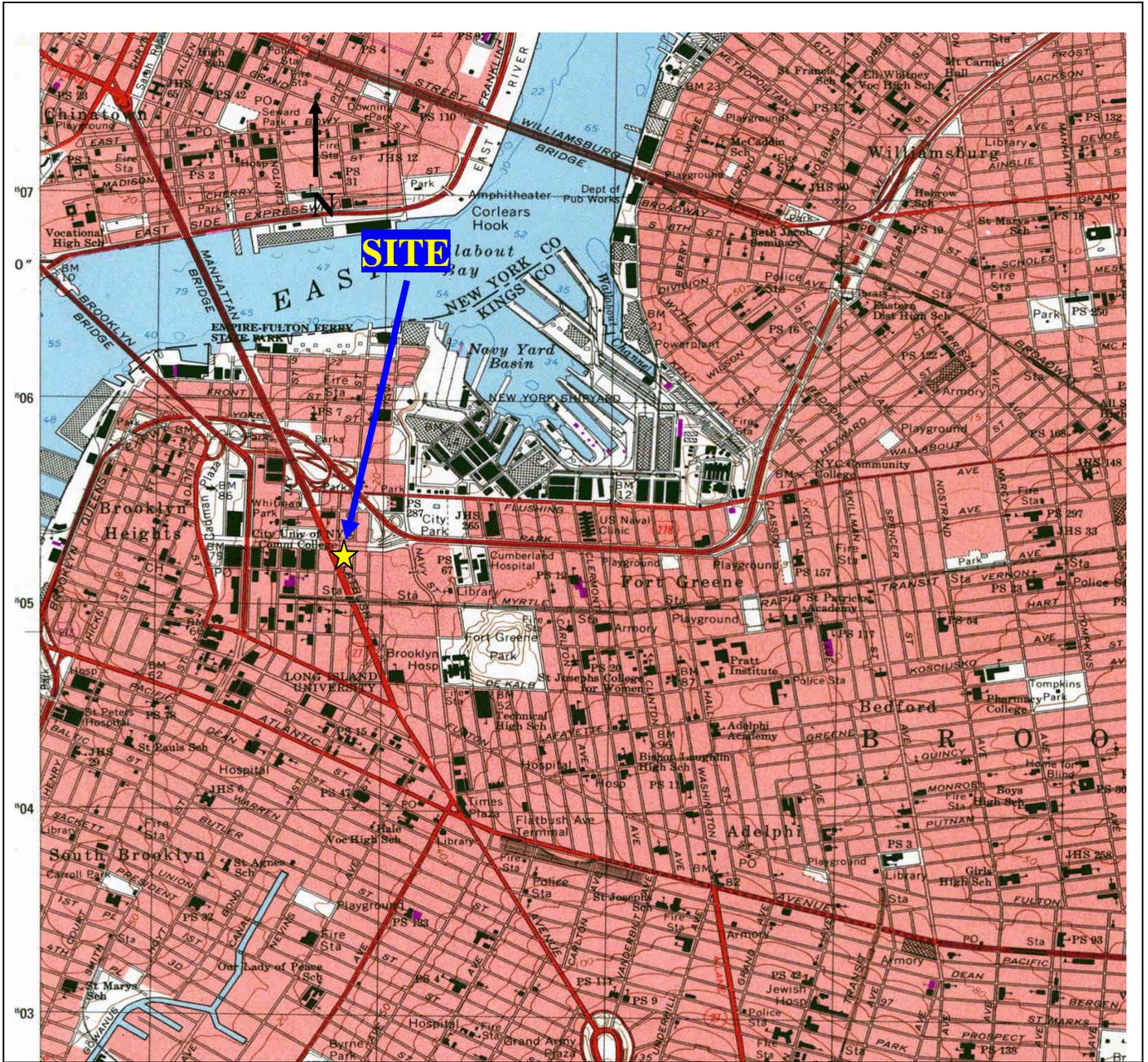
I, _____, am a Qualified Environmental Professional. I had primary direct responsibility for implementation remedial program at 156 Tillary Street, Brooklyn, NY NYC VCP Site Number 15CVCP030K..

I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a two month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-4
Mobilization	1	1
Remedial Excavation	2	8
Demobilization	10	1
Submit Remedial Action Report	TBD	TBD



156 Tillary Street
Brooklyn, NY

URS Corporation

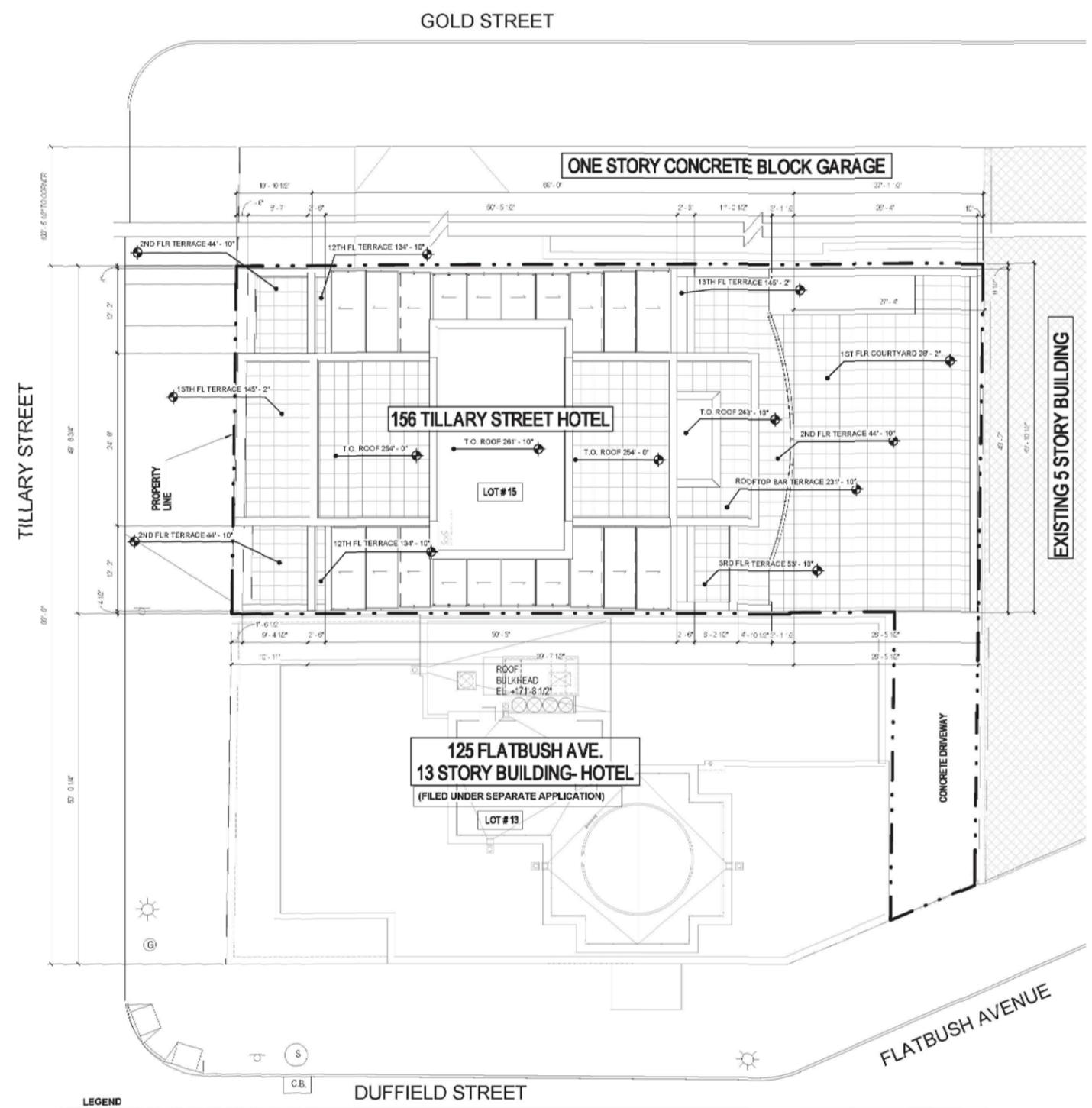
Date: 1995

Reference: USGS 7.5 Minute Quadrangle:
Brooklyn, NY 1995
Photorevised: NA

SITE LOCATION MAP

FIGURE 1

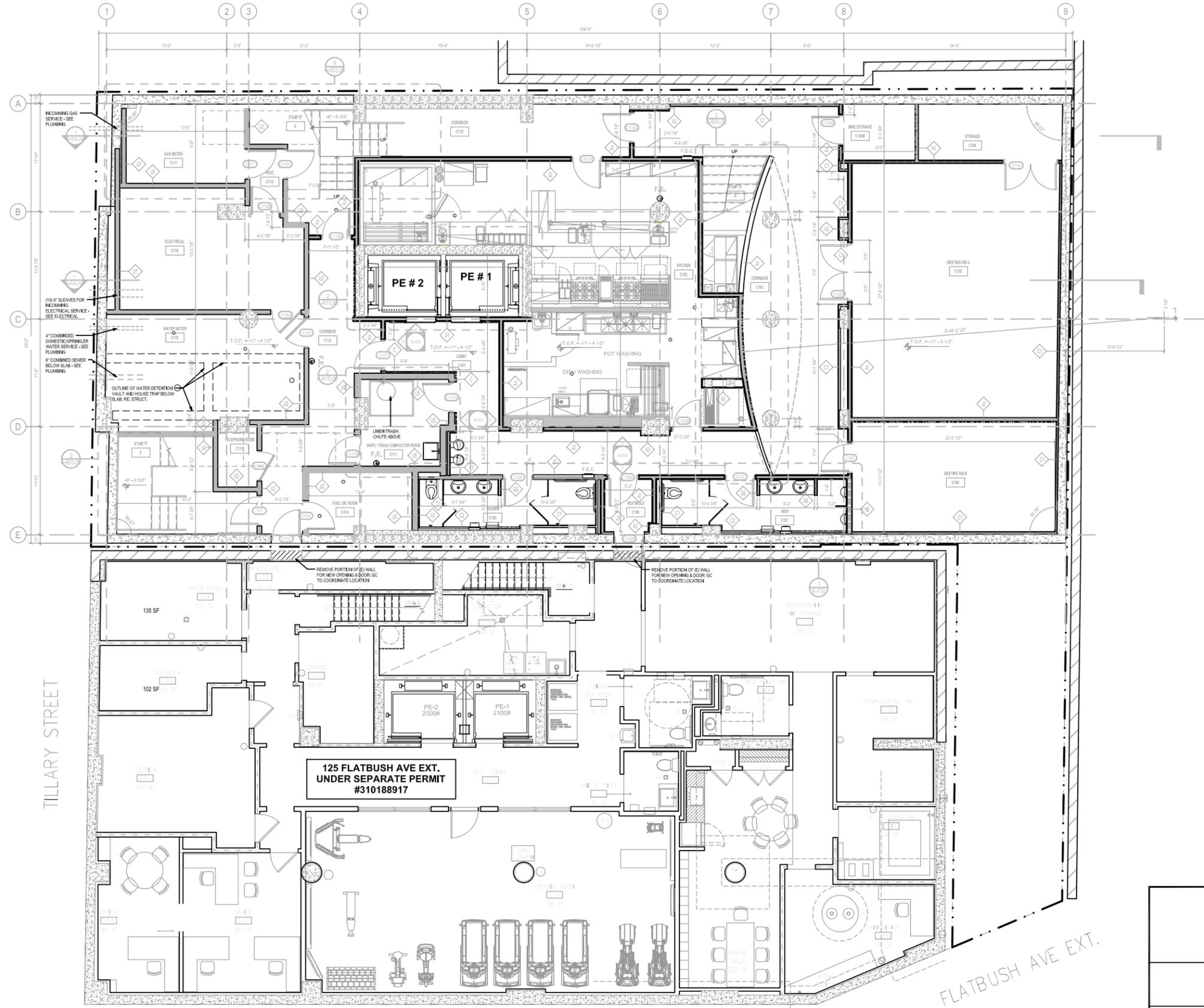
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MAP SOURCE:
 SITE PLAN, G-102.00 BY STONEHILL
 & TAYLOR ARCHITECTS AND
 PLANNERS, DATED 5-16-2014

CURRENT SITE PLAN AUGUST 2014 156 TILLARY STREET BROOKLYN, NEW YORK			
 CLIFTON, NEW JERSEY			
DR. BY	ET	SCALE	N.T.S.
CK'D. BY	CF	DATE	AUGUST 11, 2014
DWG. NO.		11140247.01-Fig.2	
PROJ. NO.		11140247	
FIG. NO.		2	

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TILLARY STREET

FLATBUSH AVE EXT.

125 FLATBUSH AVE EXT.
UNDER SEPARATE PERMIT
#310188917

MAP SOURCE:
CELLAR CONSTRUCTION PLAN, A-100.00
BY STONEHILL & TAYLOR ARCHITECTS AND
PLANNERS, DATED 5-16-2014.

REDEVELOPMENT PLAN (CELLAR)
AUGUST 2014
156 TILLARY STREET
BROOKLYN, NEW YORK

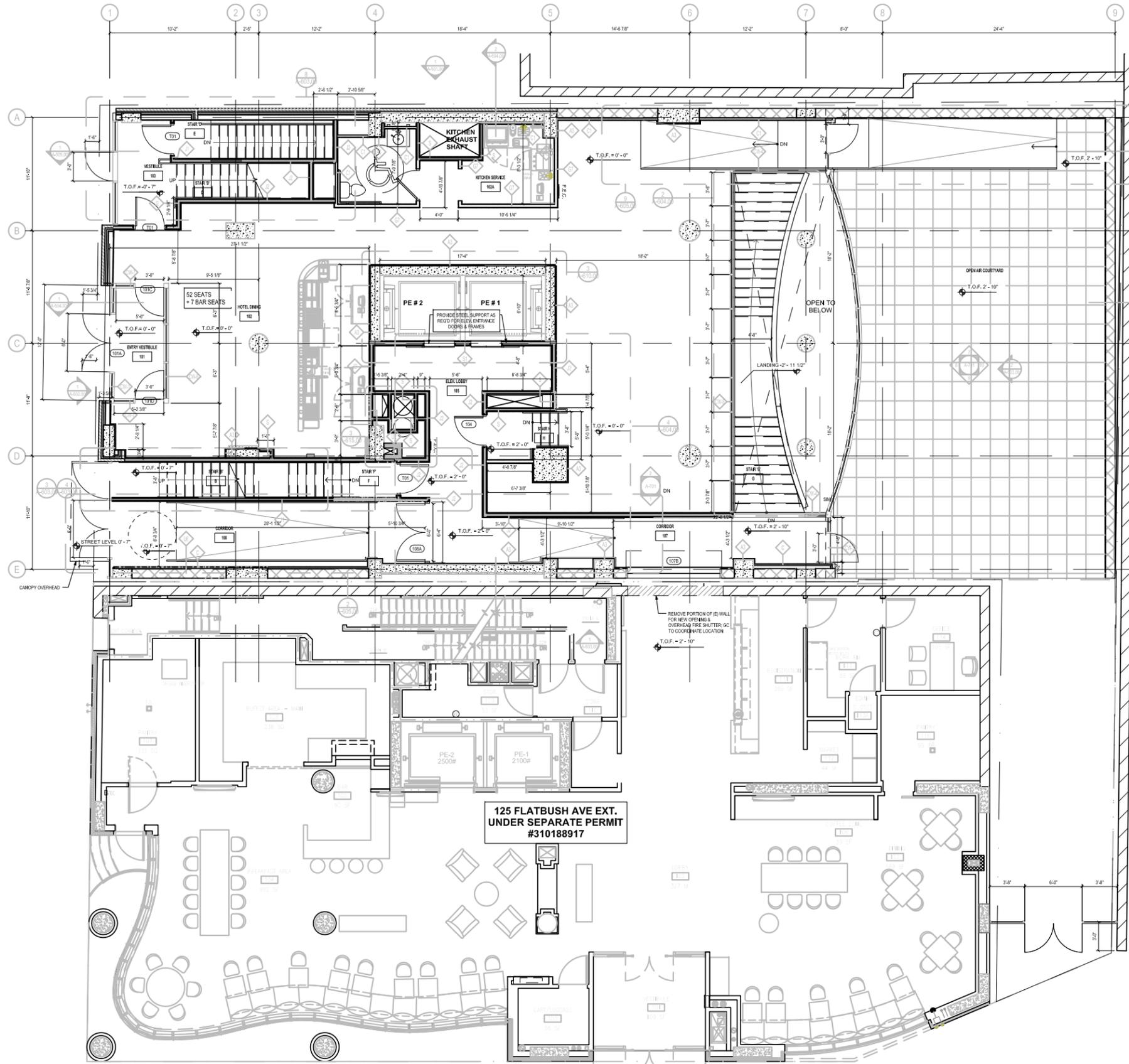


CLIFTON, NEW JERSEY

DR. BY ET	SCALE N.T.S.	DWG. NO. 11140247.02-Fig.3A	PROJ. NO. 11140247
CK'D. BY CF	DATE AUGUST 11, 2014	FIG. NO. 3A	

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TILLARY STREET



MAP SOURCE:

1ST FLOOR CONSTRUCTION PLAN,
A-101.00 BY STONEHILL & TAYLOR
ARCHITECTS AND PLANNERS, DATED
5-16-2014.

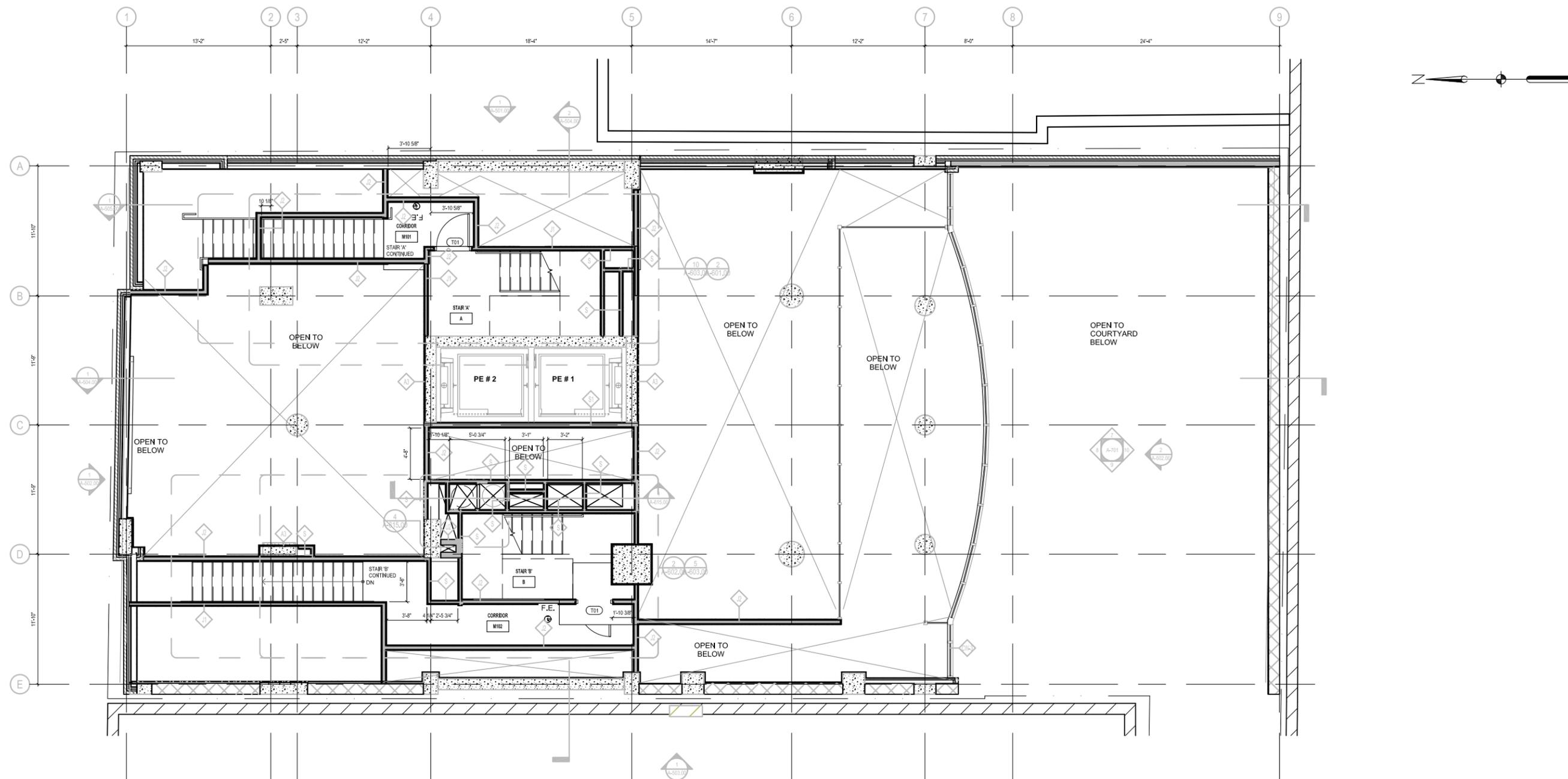
REDEVELOPMENT PLAN (1ST FLOOR)
AUGUST 2014
156 TILLARY STREET
BROOKLYN, NEW YORK



CLIFTON, NEW JERSEY

DR. BY ET	SCALE N.T.S.	DWG. NO. 11140247.03-Fig.3B	PROJ. NO. 11140247
CK'D. BY CF		DATE AUGUST 11, 2014	FIG. NO. 3B

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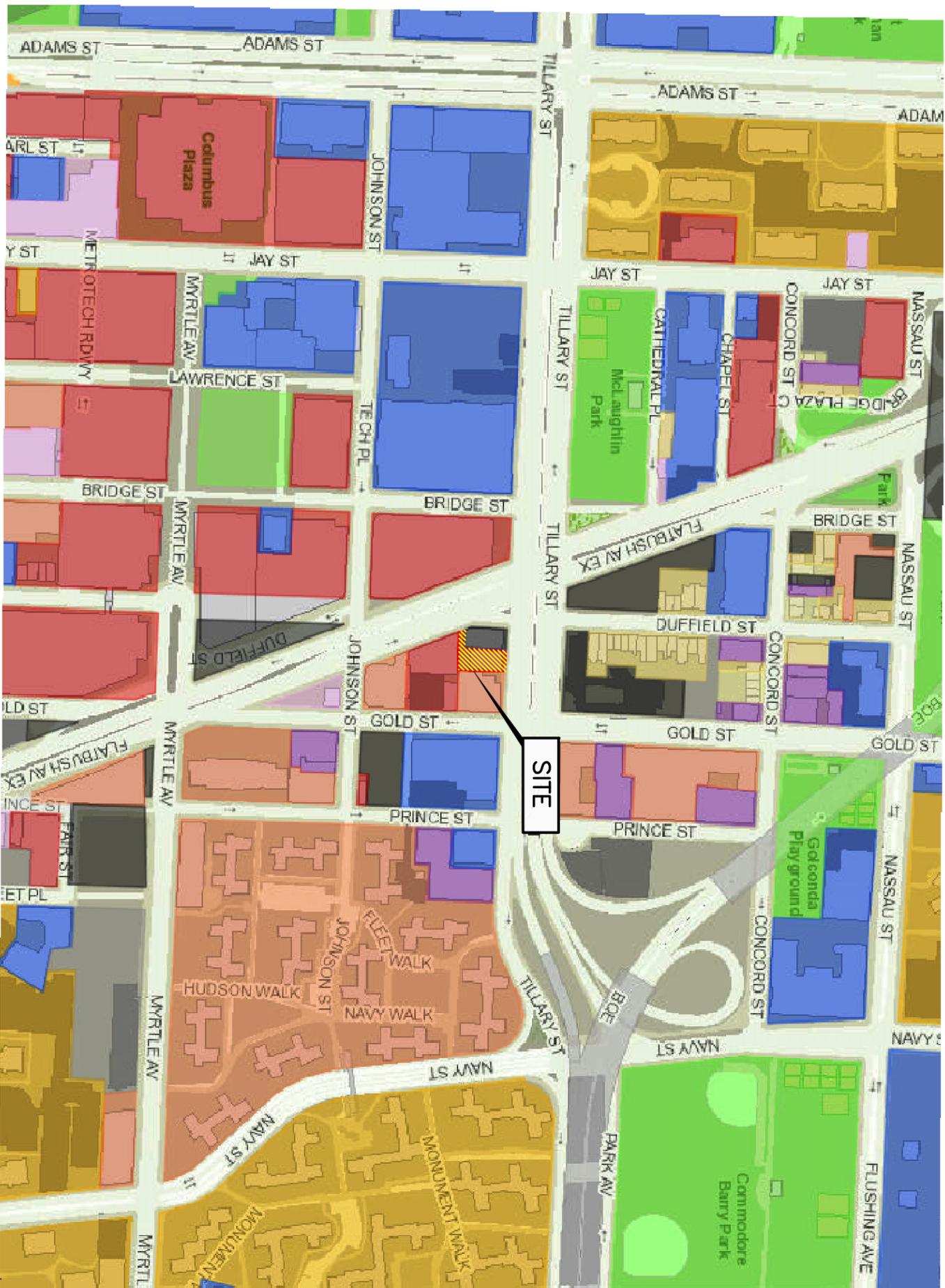
MAP SOURCE:
 1ST FLOOR CONSTRUCTION PLAN,
 A-101.00 BY STONEHILL & TAYLOR
 ARCHITECTS AND PLANNERS, DATED
 5-16-2014.

REDEVELOPMENT PLAN (MEZZANINE)
 AUGUST 2014
 156 TILLARY STREET
 BROOKLYN, NEW YORK

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CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	N.T.S.	DWG. NO.	11140247.04-Fig.3C	PROJ. NO.	11140247
CK'D. BY	CF	DATE	AUGUST 11, 2014	FIG. NO.	3C		



LEGEND:

- One & Two Family Residence
- Multi-Family Residence (Walkup)
- Multi-Family Residence (Elevator)
- Mixed Residential & Commercial
- Commercial Use
- Industrial / Manufacturing
- Transportation / Utility
- Public Facilities and Institutions
- Open Space & Recreation
- Parking
- Vacant Land

MAP SOURCE:
 NYC PLANNING, ZONING AND LAND
 USE WEBSITE.

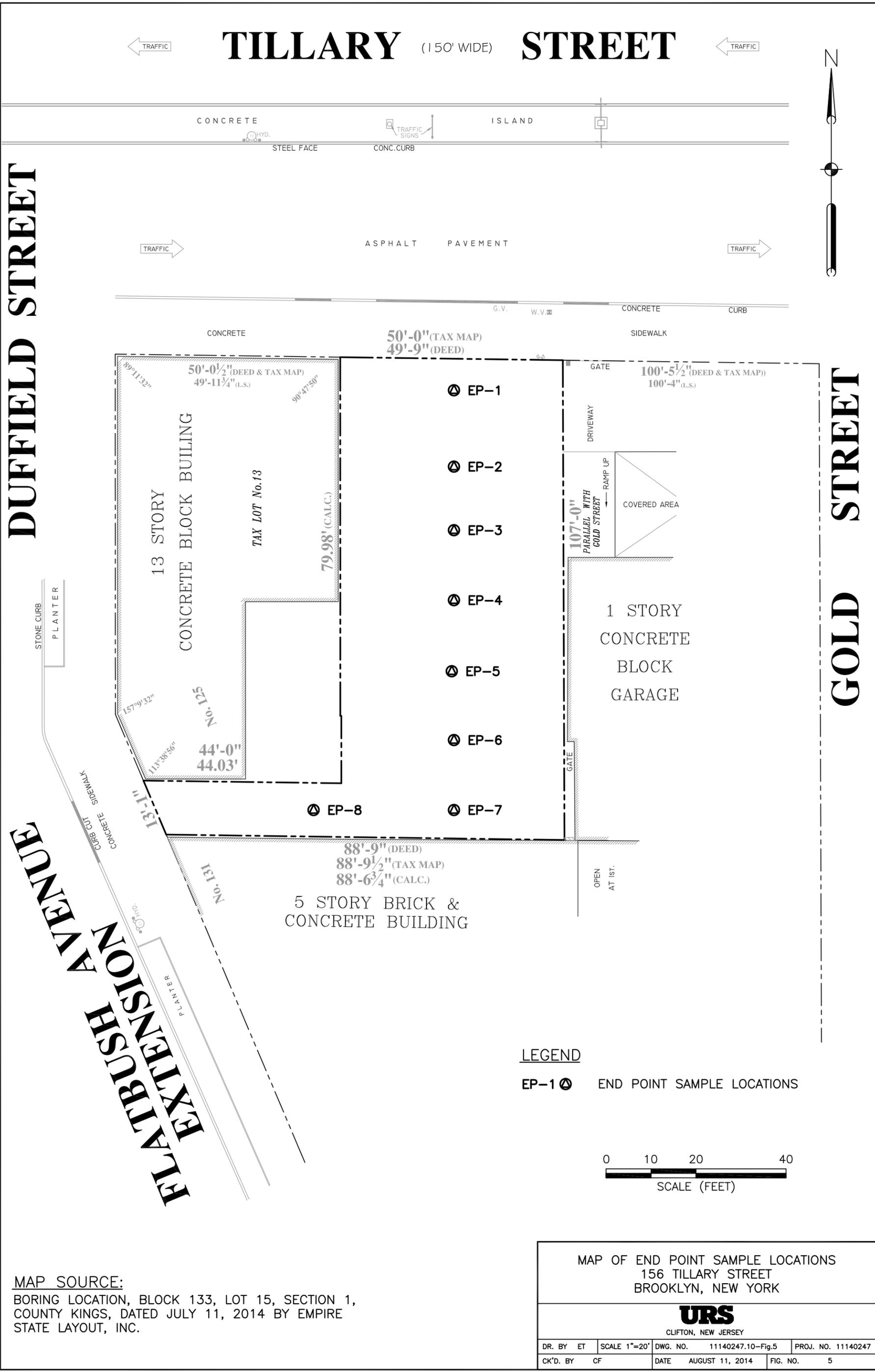
SURROUNDING LAND USE MAP
 156 TILLARY STREET
 BROOKLYN, NEW YORK

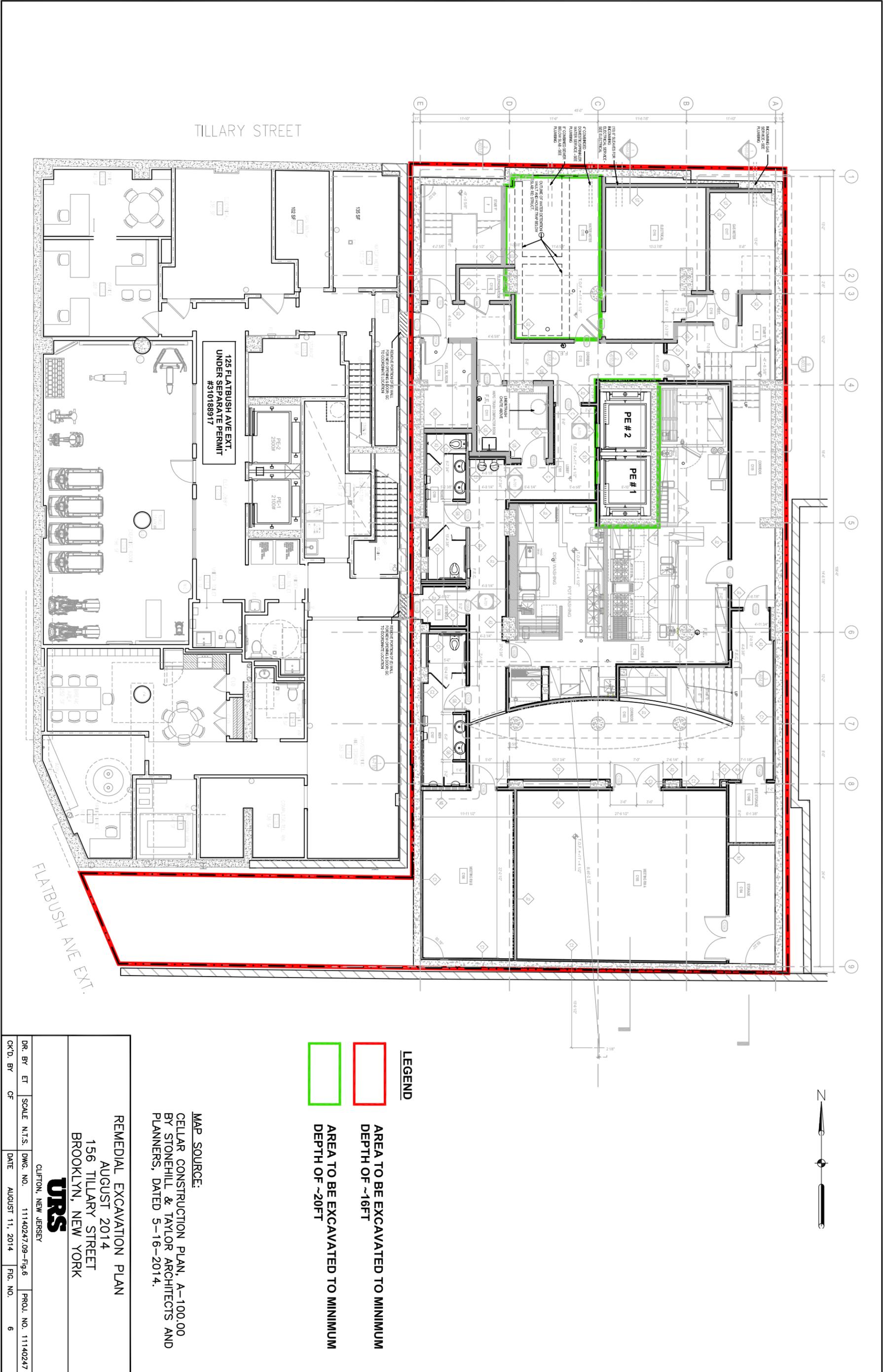


CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	N.T.S.	DWG. NO.	11140247.05-Fig.4	PROJ. NO.	11140247
OK'D. BY	CF	DATE	AUGUST 11, 2014	FIG. NO.	4		

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LEGEND

- AREA TO BE EXCAVATED TO MINIMUM DEPTH OF ~16FT
- AREA TO BE EXCAVATED TO MINIMUM DEPTH OF ~20FT

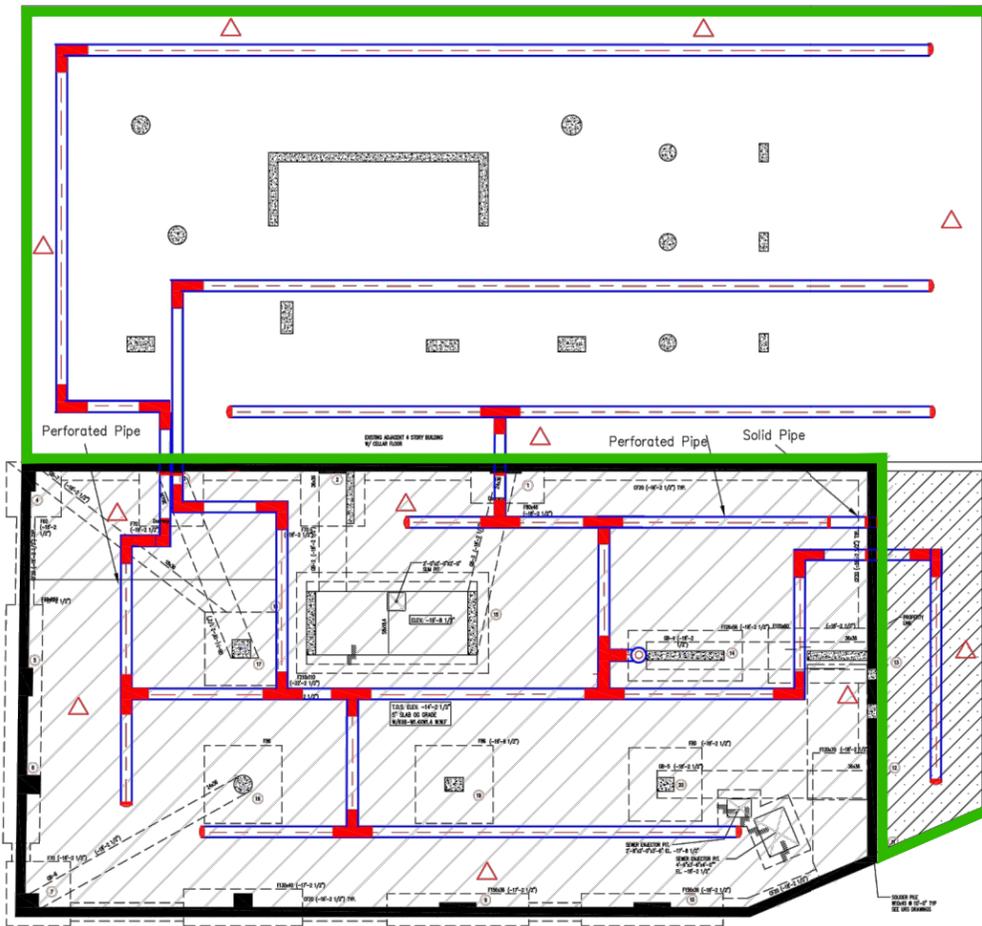
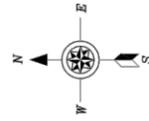
MAP SOURCE:
 CELLAR CONSTRUCTION PLAN, A-100.00
 BY STONEHILL & TAYLOR ARCHITECTS AND
 PLANNERS, DATED 5-16-2014.

REMEDIAL EXCAVATION PLAN
 AUGUST 2014
 156 TILLARY STREET
 BROOKLYN, NEW YORK



CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	N.T.S.	DWG. NO.	11140247.09-Fig.6	PROJ. NO.	11140247
CK'D. BY	OF	DATE	AUGUST 11, 2014	FIG. NO.	6		



CELLAR FLOOR AND FOUNDATION PLAN

NOTE:
1. SEE ARCH. & MECH. DWGS FOR PIPE PENETRATION LOCATIONS

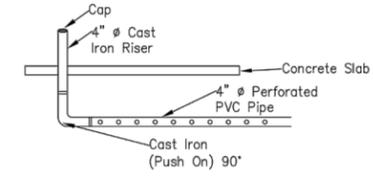


LEGEND

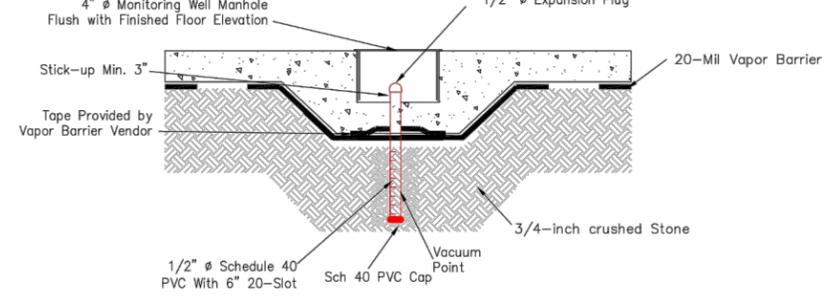
- 4" Diameter Perforated PVC Pipe
- 4" Diameter Riser Vent to Roof
- Vapor Barrier Under Slab
- Temporary Vacuum Monitoring Point (Used During pilot Test)
- PVC End Cap
- PVC "T"
- PVC 90°
- PVC 45°

SITE

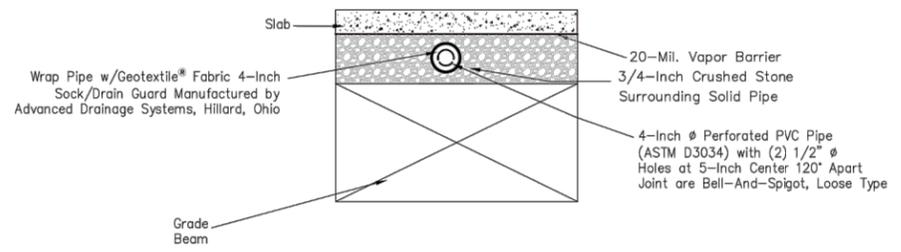
Riser Detail (NTS)



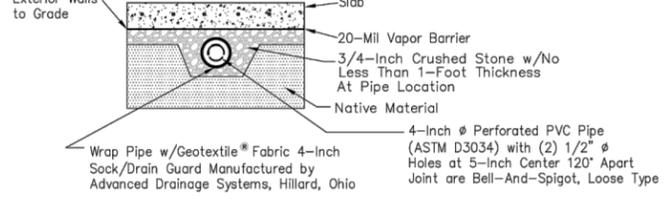
Typical Vacuum Monitoring Point (NTS)



Typical SSD Piping at Grade Beams Crossing (NTS)



Typical Vent Pipe Cross-Section (NTS)



Note: Piping layout to be finalized once the planned locations of footings, piles, grade beams, elevator pits, and sewer ejector sumps have been developed.

MAP SOURCE:
PRELIMINARY DRAFT SUB-SLAB DEPRESSURIZATION PIPING BY STEPHEN J. OSMUNDSEN, PE, DATED 4-8-2014.

PRELIMINARY DRAFT SUB-SLAB DEPRESSURIZATION PIPING
156 TILLARY STREET
BROOKLYN, NEW YORK



CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	N.T.S.	DWG. NO.	11140247.11-Fig.7	PROJ. NO.	11140247
CK'D. BY	CF	DATE	AUGUST 11, 2014	FIG. NO.	7		

K:\Cadd\11140247(156 Tillary St.)-RIR\11140247.11-Fig.7.dwg, Layout1 (2), 9/9/2014 4:09:46 PM

Table 1
NYS DEC Part 375 Unrestricted Use SCOs
(Track 1)

Chemical Compound	NYS DEC Tables 375-6.8 (a) and (b) Standards, ppm
	Unrestricted Use (a)
Metals	
Aluminum	NS
Antimony	NS
Arsenic	13 c
Barium	350 c
Beryllium	7.20
Cadmium	2.5 c
Calcium	NS
Chromium, hexavalent	1b
Chromium, trivalent	30 c
Cobalt	NS
Copper	50.00
Total Cyanide	27.00
Iron	NS
Lead	63 c
Magnesium	NS
Manganese	1600 c
Total Mercury	0.18 c
Nickel	30
Potassium	NS
Selenium	3.9 c
Silver	2
Sodium	NS
Thallium	NS
Vanadium	NS
Zinc	109 c
PCBs/Pesticides	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE (P,P-DDE)	0.0033 b
4,4'-DDT (P,P-DDT)	0.0033 b
4,4'-DDD (P,P-DDD)	0.0033 b
Alachlor	NS
Aldrin	0.005 c
alpha-BHC	0.02
beta-BHC	0.036
Chlordane (alpha)	0.094
Chlordane (gamma)	NS
delta-BHC	0.04
Dibenzofuran	7
Dieldrin	0.005c
Endosulfan I	2.4
Endosulfan II	2.4
Endosulfan sulfate	2.4
Endrin	0.014
Endrin aldehyde	NS
Endrin ketone	NS
gamma-BHC (Lindane)	0.1
Heptachlor	0.042
Heptachlor epoxide	NS
Methoxychlor	NS
Toxaphene	NS
Aroclor-1016	*
Aroclor-1221	*
Aroclor-1232	*
Aroclor-1242	*
Aroclor-1248	*
Aroclor-1254	*
Aroclor-1260	*
Aroclor-1262	*
Aroclor-1268	*
Total PCBs	0.1

Table 1
NYS DEC Part 375 Unrestricted Use SCOs
(Track 1)

Chemical Compound	NYS DEC Tables 375-6.8 (a) and (b) Standards, ppm
	Unrestricted Use (a)
Volatile Organic Compounds (VOCs)	
1,1,1-Trichloroethane	0.68
1,1,2,2-Tetrachloroethane	NS
1,1,2-Trichlorotrifluoroethane	NS
1,1,2-Trichloroethane	NS
1,2-Dibromoethane	NS
1,2-Dibromo-3-Chloropropane	NS
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02c
1,2-Dichloropropane	NS
cis -1,2-Dichloroethene	0.25
1,2,3-Trichlorobenzene	NS
1,2,4-Trichlorobenzene	NS
cis-1,3-Dichloropropene	NS
trans-1,2-Dichloroethene	0.19
1,3-Dichlorobenzene	2.4
trans-1,3-Dichloropropene	NS
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1 b
2-Butanone	NS
2-Hexanone	NS
4-Methyl-2-Pentanone	NS
Acetone	0.05
Benzene	0.06
Bromomethane	NS
Bromochloromethane	NS
Bromodichloromethane	NS
Bromoform	NS
n-Butylbenzene	12
Carbon Disulfide	NS
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Chloroethane	NS
Chloromethane	NS
Cyclohexane	NS
Dichlorodifluoromethane	NS
Dibromochloromethane	NS
Ethylbenzene	1
Hexachlorobenzene	0.33b
Isopropylbenzene	NS
Methyl Acetate	NS
Methyl ethyl ketone	0.12
Methylcyclohexane	NS
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Naphthalene	12
n - Propylbenzene	3.9
sec-Butylbenzene	11
tert-Butylbenzene	5.9
Styrene	NS
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
Trichlorofluoromethane	NS
1,2,4-Trimethylbenzene	3.6
1,3,5-Trimethylbenzene	8.4
Vinyl chloride	0.02
Xylene (total)	0.26

Table 1
 NYS DEC Part 375 Unrestricted Use SCOs
 (Track 1)

Chemical Compound	NYS DEC Tables 375-6.8 (a) and (b) Standards, ppm
	Unrestricted Use (a)
Semivolatile Organic Compounds (SVOCs)	
1,1-Biphenyl	NS
1,2,4,5-Tetrachlorobenzene	NS
2-Chloronaphthalene	NS
2-Chlorophenol	NS
2-Methylnaphthalene	NS
2-Methylphenol	NS
2-Nitroaniline	NS
2-Nitrophenol	NS
2,2-oxybis(1-Chloropropane)	NS
3+4-Methylphenols	NS
2,3,4,6-Tetrachlorophenol	NS
2,4-Dichlorophenol	NS
2,4-Dimethylphenol	NS
2,4,5-Trichlorophenol	NS
2,4,6-Trichlorophenol	NS
2,4-Dinitrophenol	NS
2,4-Dinitrotoluene	NS
2,6-Dinitrotoluene	NS
3-Nitroaniline	NS
3,3-Dichlorobenzidine	NS
4-Bromophenyl-phenylether	NS
4-Chloroaniline	NS
4-Chloro-3-methylphenol	NS
4-Chlorophenyl-phenylether	NS
4-Nitroaniline	NS
4,6-Dinitro-2-methylphenol	NS
Acenaphthene	20
Acenaphthylene	100
Acetophenone	NS
Anthracene	100
Atrazine	NS
Benz(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	0.8
Benzaldehyde	NS
bis(2-Chloroethoxy)methane	NS
bis(2-Chloroethyl)ether	NS
bis(2-Ethylhexyl)phthalate	NS
Butylbenzylphthalate	NS
Carbazole	NS
Chrysene	1
Dibenz(a,h)anthracene	0.33
Dibenzofuran	NS
Diethylphthalate	NS
Dimethylphthalate	NS
Di-n-butylphthalate	NS
Di-n-octyl phthalate	NS
Fluoranthene	100
Fluorene	30
Hexachloroethane	NS
Hexachlorobenzene	NS
Hexachlorobutadiene	NS
Hexachlorocyclopentadiene	NS
Indeno(1,2,3-cd)pyrene	0.5
Isophorone	NS
m-Cresol	0.33
Naphthalene	12
N-Nitroso-di-n-propylamine	NS
Nitrobenzene	NS
N-Nitrosodiphenylamine	NS
o-Cresol	0.33
p-Cresol	0.33
Pentachlorophenol	0.8
Phenanthrene	100
Phenol	0.33
Pyrene	100

Table 2
Track 4 Soil Cleanup Objectives
(ppm)

Chemical Compound(s)	TRACK 4 SOIL CLEANUP OBJECTIVES (PPM)
Total SVOCs	250
Arsenic	24
Lead	1000
Mercury	3

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Brooklyn LW Hotel Associates, L.P. have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Brooklyn LW Hotel Associates, L.P. will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Sarah Pong, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 442-8342.

Project Contact List. OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project

manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Brooklyn LW Hotel Associates, L.P. will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Walt Whitman Public Library

93 Saint Edwards Street

Brooklyn, New York 11205

718-935-0214

10AM through 6PM

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Identify Issues of Public Concern.

There are no known Issues of Public Concern. Should any be identified during the public comment period, they will be addressed in consultation with NYC OER. The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a Community Air Monitoring Plan are required components of the remedial program. Implementation of these plans will be under the direct oversight of the New York City Department of Environmental Remediation (NYCOER).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Brooklyn LW Hotel Associates, L.P., reviewed and approved by OER prior to distribution and mailed by Brooklyn LW Hotel Associates, L.P.. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides

details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

APPENDIX 2

SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency. Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions.

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

Linkage with Green Building. Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. Brooklyn LW Hotel Associates, L.P. is participating in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. Brooklyn LW Hotel Associates, L.P. is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as

videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

APPENDIX 3

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are:

- Southeast on Flatbush Avenue toward Atlantic Avenue
- Sharp right onto Pacific Street
- Left on 4th Street
- Right on Prospect Avenue
- Merge onto I-278 W/Brooklyn Queens Expressway/Gowanus Expressway

This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with

disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 1. Currently, there are no plans to reuse soil on-site. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement

of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.

- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

APPENDIX 4

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

REMEDIAL ACTIVITIES

FOR

**156 TILLARY STREET,
BROOKLYN, NY**

Prepared for:

Brooklyn LW Hotel Associates, L.P.

8100 E 22nd Street #500

Wichita, KS 67226

Prepared by:

URS Corporation

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New York, New York 10119

September 2014

URS Project Number: 11140247

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SMS 026	Noise and Hearing Conservation
SMS 029	Personal Protective Equipment
SMS 030	Sanitation
SMS 032	Work Zone Traffic Control
SMS 034	Utility Clearances and Isolation
SMS 042	Respiratory Protection
SMS 043	Personal Monitoring (Industrial Hygiene)
SMS 046	Subcontractor Health and Safety Requirements
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Preface

This Health and Safety Plan (HASP) presents health and safety requirements and guidelines for the Remedial Activities being conducted on 156 Tillary Street, Brooklyn, New York (hereinafter, collectively referred to as the “Site”), specifically the work described in Section 4 of this HASP (the “Project”). This HASP has been prepared in compliance with applicable sections of Occupational Safety and Health Administration (OSHA) Regulations 29 Code of Federal Regulations (CFR) Part 1910 and 29 CFR Part 1926. This HASP has been prepared for the exclusive use of employees of URS Corporation (URS). This HASP shall be available at all times during field activities at the Site.

This HASP shall not be used for work activities other than those described in Section 4, nor shall it be modified or used after the expiration date (one year from date of issue) without written approval of the URS Project Manager and Health and Safety Manager (HSM). In addition, this HASP shall not be used by firms or persons not under contract to URS without written approval of URS. This HASP is not valid unless it is signed and dated by the Project Manager, HSM and Regional Health and Safety Manager (RHSM). Any modifications to this HASP require a written addendum and must be approved by the URS Project Manager and HSM.

URS subcontractors may use their own HASP if such a provision is contained in a written agreement with URS. General health and safety requirements in HASPs prepared by URS subcontractors must be as stringent as those contained in this HASP. URS Safety Management Standard (SMS) 046, Subcontractor Health and Safety Requirements, presents additional information on this subject (all SMSs referenced in this HASP are provided in Appendix A).

Contractors and URS subcontractors (hereinafter, all referred to as “Contractors”) involved in field activities who adopt this HASP for the protection of their employees are required to read the HASP and comply with its provisions. The adoption of this HASP does not relieve Contractors of their obligations to provide a safe working environment in accordance with all applicable Federal, State and local requirements including, but not limited to, OSHA Regulations 29 CFR Parts 1910 and 1926. Contractors are solely responsible for providing their employees with appropriate personal protective equipment and monitoring air quality; Contractors are solely responsible for actions taken by their personnel based on the readings.

The health and safety guidelines and requirements presented herein are based on a review of available information and an evaluation of potential hazards. This HASP outlines the health and safety procedures, and equipment required for work activities at this Site to reduce the potential for exposure to field personnel. Changing and/or unanticipated site conditions may require modification of this HASP to maintain a safe and healthful work environment. Any proposed changes to this HASP require a written addendum, which must be approved by the URS Project Manager and HSM. Under no circumstances will modifications to this HASP conflict with Federal, State or local health and safety requirements.

List of Acronyms and Abbreviations

ANSI	American National Standards Institute
AOC	Area of Concern
bgs	Below Ground Surface
BNs	Base Neutral Compounds
BZ	Breathing Zone
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
CRZ	Contamination Reduction Zone
dB	Decibels
dba	Decibels on the A-scale
DOT	Department of Transportation
DPT	Direct Push Technology
ESLI	End of Service Life Indicator
ext	Extension
eV	Electron Volt
EZ	Exclusion Zone
F	Fahrenheit
ft	Feet
GWQS	Ground Water Quality Standards
HASP	Health and Safety Plan
hr	Hour
HSM	Health and Safety Manager
J	Estimated Concentration
JSA	Job Safety Analysis
LEL	Lower Explosion Limit
mg/kg	Milligrams per kilogram
µg/L	Microgram per liter
NA	Not Analyzed
NIOSH	National Institute of Occupational Safety and Health
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Administration
OVM	Organic Vapor Monitor

List of Acronyms and Abbreviations

PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl Chloride
RHSM	Regional Health and Safety Manager
SI	Site Investigation
SDSs	Safety Data Sheets
SMS	Safety Management Standard
SSO	Site Safety Officer
SVOCs	Semi-Volatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TOGS	Technical and Operational Guideline Series
TP	Test Pit
URS	URS Corporation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

Project Name: Remedial Activities
156 Tillary Street

Project Number: 11140247

Project Location: 156 Tillary Street
Brooklyn, New York

Client: **Brooklyn LW Hotel Associates, L.P.**
8100 E 22nd Street #500
Wichita, KS

URS Operating Unit: New York, NY

URS Project Manager: Robert Wolff

URS Task Manager: Cary Friedman

Author of the HASP: Robert Wolff

Effective Dates: October 2014 to October 2015
APPROVALS

Robert Wolff
Project Manager

Date

Benjamin J. Bertolotti, CIH
Regional Health and Safety Manager

Date

This section describes the roles of the various positions on the Project as they pertain to health and safety. The names, responsibilities and authorities of key individuals are presented in Table 1.

Other URS personnel who might be involved in field activities include those listed below. All personnel named on this list are qualified to serve as SSOs.

Friedman, Cary
Abdelaziz, Mira
Michael Angelo
Dascoli, Megan
Crespo, John

Other personnel may be assigned to the Project as well. Personnel working on the Project must be approved by the HSM and must meet the qualifications of OSHA Regulation 29 CFR Part 1910.120 and this HASP.

3.1 GENERAL SITE DESCRIPTION AND HISTORY

This section provides a general description and brief history of the Site located at 156 Tillary Street, Fort Greene Section, Brooklyn, New York. The information presented below is based upon previous environmental documentation available for URS review at the time of HASP preparation.

3.1.1 156 Tillary Street

This property is currently vacant land, totaling approximately 5,831-square feet (SF). The property is bounded by Tillary Street to the north, a five-story brick building to the south, a one-story garage building to the east, and a newly constructed thirteen-story hotel to the west. The Tax Map Identification for this site is Block number 133 and Lot(s) number 15.

The proposed future use of the Site will consist of a 20-story brick masonry building which will be utilized as a hotel. The current zoning designation is C6-4 which permits a wide range of commercial uses; these properties are typically mapped within the city's major business districts. The proposed use is consistent with existing zoning for the property. Currently, the Site houses a vacant four-story brick masonry building.

The proposed building will have a basement consisting of mechanical rooms for utilities; a large kitchen, two meeting rooms, bathrooms, and a corridor open to the first floor. The first floor (ground level) will house restaurants, storage areas, and an open air courtyard with restaurant seating. Guest rooms for the hotel begin on the second floor. No landscaped areas are planned at the site.

The proposed development will cover the entire footprint of the site.

URS conducted Phase I and Phase II investigations in December 2012 and May 2014 respectively. The only REC listed in the Phase I was the historic site use of the property as a "drug company".

The Phase II investigation consisted of soil, groundwater, and soil gas sampling and laboratory analysis. Results indicated the presence of metals including arsenic and lead in site soils and groundwater potentially related to the site's previous use as a "drug company". Other semi-volatile compounds were found in site soils and groundwater likely related to the presence of historic fill at the site.

3.2 PROJECT OBJECTIVES

The objective of this project is to obtain a Notice of Satisfaction from the NYCDEP Office of Environmental Remediation for submittal to the NYC Department of Buildings. In order to achieve this objective, a Remedial Action Workplan has been written for the Site developed for utilization during construction, so all excavated soils are properly handled and disposed off-site. The overall objective is to obtain a notice to proceed with construction of an apartment building from the NYC Department of Buildings.

4.1 WORK ACTIVITIES

This HASP covers the following activities:

- Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
- Establish Soil Cleanup Objectives (SCOs) for contaminants of concern. Excavation and removal of soil/fill exceeding SCOs.
- Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
- Removal of underground storage tanks and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations (if encountered).
- Construction and maintenance of an engineered composite cover consisting of:
 - 2-feet of clean cover soil in open spaces (if any);
 - asphalt covered roads and driveways;
 - concrete covered sidewalks;
 - concrete building slabs.

to prevent human exposure to residual soil/fill remaining under the Site.

- Installation of a vapor barrier system beneath the building slab and along foundation sidewalls.
- Demarcation of residual soil/fill.
- Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.

- Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
- Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
- Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
- Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
- Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

This HASP does not cover any site activities other than those specifically described above. Other possible work activities not described above may be conducted after approval of an appropriate Addendum to this HASP by the HSM.

This HASP will expire on October 2015. Use of this HASP after this date to perform the work activities described herein or other activities in addition to those described herein, is not permitted. The expiration date may be extended by the HSM by preparation of an addendum to the HASP approved by the URS Project Manager and HSM after a review of the applicability of the HASP and addenda issued, if any, to actual site conditions encountered has been made by the HSM.

5.1 OVERVIEW

This HASP covers work that could potentially be performed as part of the Remedial Activities. The specific tasks covered in this HASP are described in Section 4. This HASP does not provide for worker protection in confined spaces, or in places with limited egress or in excavations.

The work in this HASP is investigative in nature. It must be recognized that knowledge of the types of substances or chemicals that might be encountered, or the concentrations of chemicals that might be found, are obtained from previous studies in specific areas and from histories of activities and work practices at the Site. Based on a review of the available information pertaining to the Site, contaminants of concern were identified. Material Safety Data Sheets (MSDSs) or Safety Cards for these contaminants can be found in Appendix B along with MSDSs for materials to be brought to the Site as part of the Inspection.

5.2 HAZARD SUMMARY

This HASP considers work tasks that will be performed at the Site during the Inspection. A general assessment of the hazards has been made based on the work activities described in Section 4. The following potential hazards have been identified:

- inhalation of dusts;
- inhalation of volatile chemical constituents;
- skin and eye contact with chemical constituents;
- ingestion of chemical constituents;
- physical hazards associated with the use of heavy equipment;
- noise exposure;
- slip-trip-fall hazards;
- lifting hazards;
- weather hazards;
- underground structures/obstructions/utilities;
- traffic hazards;
- use of personal protective equipment;
- heat stress;
- cold exposure;
- biological hazards;
- flammable hazards; and,
- electrical hazards.

Other hazards may be identified during work at the Site; these hazards, if any, will be addressed by an addendum to this HASP prepared by the HSM and authorized by the URS Project Manager and the HSM.

5.3 CHEMICAL HAZARDS

An analysis was performed to determine site-specific health and safety requirements to protect workers performing tasks outlined in Section 4. The analysis was performed by studying available sampling and site history information. Taken into account were the chemical constituents found during previous investigations, the toxicity and routes of exposure to workers, and the capabilities of field detection devices. This HASP has adopted the use of the “lowest allowable exposure limit” which is the most conservative of the exposure limits given by OSHA, the National Institute of Occupational Safety and Health (NIOSH), or the American Conference of Governmental Industrial Hygienists. Inhalation and dermal contact would be the primary routes of exposure. Ingestion is a secondary route of exposure.

5.3.1 Chemical Hazards Due to Site Contaminants

Based on the results of previous investigations conducted at the Sites, field personnel might potentially be exposed to a number of different classes of contaminants, including:

- base neutral compounds and,
- heavy metals (Mercury, Lead and Arsenic)

Each of these classes of compounds is discussed below.

Base Neutral Compounds

Properties for base neutral compounds (polynuclear aromatic hydrocarbons [PAHs]) generally correlate with molecular weight, or number of rings in the compound structure. Solubilities range from 34.4 mg/l for the two ring naphthalene to less than 0.01 mg/l for four and five ring compounds (e.g., chrysene and benzo(a)pyrene). Estimated sediment/water partition coefficients similarly vary from about 100 for naphthalene to 10,000 to 100,000 for representatives of the four and five ring compounds. This trend can be expected to continue for higher molecular weight PAH compounds, although available data are limited. Vapor pressures are relatively low for PAH compounds. The largest reported vapor pressure is 0.05 mm Hg for naphthalene, decreasing to less than 10⁻⁶ mm Hg for four ring and heavier compounds.

With the possible exception of the relatively soluble naphthalene, the PAH compounds are strongly sorbed to soils and sediments, and are generally found in the particulate phase of surface waters and in sediments. This property limits the groundwater mobility of the heavier PAH compounds.

PAH compounds in subsurface soil and ground water are quite persistent, since the potential removal processes for PAHs (i.e., volatilization, photolysis and biodegradation) will not occur at significant rates under typical subsurface conditions.

In summary, PAH compounds will, in general, be sorbed to soils, sediments and suspended particulate matter. PAHs may be removed from shallow surface waters by volatilization and photolysis. Significant biodegradation of the lighter PAH compounds may occur in surface soil and sediments. The PAHs bioconcentrate significantly, but can be metabolized and

excreted thus limiting bioaccumulation. The lighter (two and three ring) PAH compounds, especially naphthalene, may show mobility in the aqueous phase; heavier PAH compounds have extremely limited mobility in groundwater. PAH compounds are quite persistent in subsurface soils and groundwater.

Heavy Metals

Heavy metals found in the environment are derived from a variety of sources including: natural weathering of the earth's crust, mining; soil erosion; industrial discharge; urban runoff; sewage effluent; pest or disease control agents applied to plants; air pollution fallout; etc. While some heavy metals found in the environment are essential nutritionally, other are not. The latter include some heavy metals that generally have a density greater than 5 g/cm, and an atomic mass exceeding that of calcium. Most heavy metals are toxic because, as ions or in certain compounds, they are soluble in water and can be readily absorbed into plant or animal tissue. After absorption, these metals tend to bind to biomolecules such as proteins and nucleic acids, impairing their functions. The most prominent adverse effects of heavy metals involve the nervous system, hematopoietic system and kidneys.

5.3.2 Chemical Hazards Due to Materials Brought to Site

Personnel protective equipment and/or equipment decontamination may be performed using trisodium phosphate or Alconox[®]. Finally, isobutylene (i.e., isobutene) gas will be used as a calibration standard for the photoionization detector.

Workers might potentially be exposed to gasoline, diesel fuel and other chemical substances related to the operation of drilling equipment at the Site. Asphalt plug and/or bentonite are typically used for monitoring well installations.

Sunscreen and/or insect repellent including products containing N,N-diethyl-meta-toluamide (i.e., DEET) or permethrin (e.g., Permanone[®]) may be used at the Site. The sunscreen and insect repellent that may be used by site workers contain chemicals that may pose a hazard to site personnel

MSDSs for the chemical constituents of concern and chemicals to be brought to the Site are provided in Appendix B. The chemicals which are brought to the Site to conduct work activities may be hazardous and subject to regulation under OSHA's Hazard Communication Standard (i.e., 29 CFR 1910.1200). See URS SMS 002, Worker Right-to-Know (Hazard Communication), for additional information.

5.4 PHYSICAL HAZARDS

Working with/near Heavy Equipment

There is a risk of physical injury resulting from contact with heavy equipment such as construction and drilling equipment. Field personnel should be aware of the presence of these hazards and take steps to avoid them. Workers must be careful to communicate with equipment operators regarding their location and should maintain a safe distance from operating equipment at all times. Personnel should be aware of their location relative to

heavy equipment and avoid being struck by equipment or being present in “pinch points.” Use of steel-toed work boots, protective eyewear and hard hats will be required while in all work areas. URS SMS 019, Heavy Equipment Operations, presents additional information on this subject.

Dust Hazards

Airborne particulates during remedial excavations may produce dust. However, dust can have some degree of chemical constituents and inhalation of dust particles at high levels can constitute a respiratory hazard. If visible dust is observed in the breathing zone by the SSO, dust suppression techniques (such as spraying water onto exposed soil piles or work areas) will be used as required to reduce airborne dust concentrations.

Excavation Hazards

Excavations are anticipated during the work activities for this Site and will be performed by a remedial contractor. The remedial contractor will use their own site-specific HASP based upon a written agreement made with URS. The general health and safety requirements in their site-specific HASP must be as stringent as those contained in this HASP. Underground and aboveground utilities, adjacent structures or retaining walls, spoil layout, truck routes, and emergency procedures must be identified by the remedial contractor before work begins. The remedial contractor will be required to assign an excavation-competent person to the project. Documentation of this person’s qualifications will be maintained in the project safety file. The excavation-competent person:

1. Has formal documentation of training as an excavation-competent person.
2. Must be physically located at the excavations at all times while work is in progress.
3. Is responsible for conducting daily inspections of excavations, adjacent areas, and protective systems prior to each shift.
4. Is responsible for inspection after every rainstorm or other potentially hazard-producing event.
5. Must have knowledge of soils and soil classification.
6. Understands design and use of protective systems.
7. Understands the requirements of the applicable regulations.
8. Has authority to stop work and take corrective actions when conditions change.
9. Has the ability to recognize and test hazardous atmospheres.

URS field personnel will only be observing excavations and trenching. When performing observations on an excavation or trench greater than 4 feet in depth, URS field personnel must remain at least more than 2 feet from the leading edge of the excavation and must **never** enter a trench or excavation. Post-excavation soil samples will be collected from soil collected in the backhoe bucket.

Noise Exposure

The primary noise hazard during the Investigation on-Site is from the operation of the drilling and heavy equipment. Work activities may also be conducted in proximity to active taxiways where a potential for high background noise levels from aircraft does exist. In accordance with OSHA Regulation 29 CFR 1910.95, hearing protection is required to be used when noise levels exceed 85 decibels on the A-scale (dBA) averaged over an 8-hour day; hearing protection is required to be worn for exposures of greater than 100 decibels (dB) for any length of time. In the absence of instrumentation, an appropriate rule of thumb is that when normal conversation is difficult at a distance of 2 to 3 ft, hearing protection is required. Contractors shall have hearing protection at the Site for use by their employees. Ear plugs and/or muffs will be worn at all times when URS personnel are within 25 ft of operating equipment. Hearing protection will also be worn in the vicinity of generators, concrete cutters and any other high noise emitting equipment. Personnel will wash their hands with soap and potable water prior to inserting earplugs to avoid initiating ear infections. URS SMS 026, Noise and Hearing Conservation, presents additional information on this subject.

Slip-Trip-Fall Hazards

Slip-trip-fall hazards are common at field sites due to open holes; muddy, slippery or unstable surfaces; and equipment on the ground. Workers should exercise caution when working around the Site to avoid slip-trip-fall hazards. If there are holes or uneven terrain in the work area that could cause workers to slip, trip or fall, they must be covered, flagged or marked to warn workers. Slip-trip-fall hazards are greatly increased during work in or near water. If conditions become slippery, workers should take small steps with their feet pointed slightly outward to decrease the probability of slipping. Workers should watch where they are walking and, if possible, walk only in areas of good stability. While it is difficult to eliminate all slip-trip-fall hazards, implementing safe work practices, wearing proper footwear, and keeping the work area free of obstructions will reduce risk of injury. URS SMS 021, Housekeeping, provides additional information about this hazard.

Lifting Hazards

Field operations often require the performance of laborious tasks such as lifting equipment such as portable generators, coolers filled with samples and sampling equipment. All employees must implement proper lifting procedures such as keeping the load close to the body and using leg muscles instead of back muscles to perform lifting tasks. Additionally, employees will not attempt to lift large, heavy or awkwardly shaped objects without assistance. Safe lifting procedures include:

- Get help when lifting heavy loads. Lift portable generators using a two-person lift.
- When moving heavy objects such as drums or containers, use a dolly or other means of assistance.
- Plan the lift. If lifting a heavy object, plan the route and where to place the object. In addition, plan communication signals to be used (e.g., “1-2-3-lift”).

- Wear sturdy work boots shoes that are in good condition and supply traction when performing lifts.
- Keep your back straight and head aligned during the lift, and use your legs to lift the load – do not twist or bend from the waist. Keep the load in front of you – do not lift or carry objects from the side.
- Keep the heavy part of the load close to your body to help maintain your balance.

See URS SMS 069, Manual Material Handling, for additional information on this subject.

Weather

Weather conditions are an important consideration in planning and conducting site operations. Extremely hot or cold weather can cause physical discomfort, loss of efficiency and personal injury. Lightning may accompany storms, creating an electrocution hazard during outdoor operations. To eliminate this hazard, weather conditions must be monitored and work suspended during electrical storms.

Underground Structures/Obstructions/Utilities

Prior to initiating any drilling activities, the SSO will obtain utility clearances. The SSO is responsible for ensuring a safe work environment when working around electrical devices, pressurized utilities, gas, steam, water, sewage, and pipeline utilities. Pre-work walkthroughs will be performed with personnel familiar with the facility to identify any overhead, underground, and in-work area utilities such as electrical lines, gas lines, pipelines, and discharge of steam or hot liquids. These walkthroughs will minimize the chance for accidental contact with or damage to these utilities. Areas designated for intrusive investigation will be cleared of underground power cables and other utilities prior to the onset of work.

Subsurface work (i.e. drilling) will not be initiated until locations of underground utilities and similar obstructions are verified. Locations shown on as-built drawings must be confirmed with additional geophysical or other surveys.

The SSO will contact “One Call” service at least 2 working days prior to site activities to advise of the proposed work, and ask them to establish the location of the utility underground installations prior to the start of actual drilling and/or excavation. Utility clearances will be obtained for subsurface work on both public and private property. Clearances are to be in writing and signed by the party conducting the clearance. URS may also be required to contact a third party utility locate service to verify all locations prior to disturbance.

The markings of approximate locations of utilities will be protected and preserved until the markings are no longer required for safe and proper drilling. If the markings of utility locations are destroyed or removed before drilling commences or is completed, the SSO must notify the utility company or utility protection service to inform them that the markings have been destroyed.

Mechanical-assisted subsurface work (e.g., powered drill rig) will not be conducted within 5 feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure. Minimum

distances for mechanical-assisted subsurface work should be confirmed with the utility owner, as distances greater than this 5-foot minimum may be required.

Subsurface work within 5 feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure must be done by hand (e.g., hand auger or shovel) to the point where the obstruction is visually located and exposed. Once the obstruction location is confirmed in this manner, mechanical-assisted work may commence. See URS SMS 034, Utility Clearance and Isolation, for additional information.

Overhead Hazards

Overhead power lines pose a danger of shock or electrocution if the power line is contacted or severed during site operations. Prior to conducting work in areas where overhead lines could be impacted, the appropriate utility company must be notified and information obtained regarding the line voltage and the minimum separation distance required for work in this area. Drilling work operations adjacent to overhead lines will not be initiated until operations are coordinated with utility officials. Operations adjacent to overhead lines are prohibited unless one of the following conditions is satisfied:

1. Power has been shut off and positive means (e.g., lockout/tagout) have been taken to prevent lines from being energized. In all cases, utility company personnel will certify in writing to the Site Manager or SSO that the overhead utilities have been deactivated and the certification will be retained in the project files. The Site Manager must also attempt to verify power shut off by checking that power is no longer available to the affected building or equipment.
2. Equipment, or any part of the equipment, cannot come within the following minimum clearance from energized overhead lines:

Power Lines Nominal System (kilovolts)	Minimum Required Clearance (ft)
0-50	10
51- 200	15
201-300	20
301-500	25
501-750	35
751-1000	45

See URS SMS 034, Utility Clearance and Isolation, for additional information about this subject.

Work Area Protection

As some project operations may be undertaken near roadways or parking areas, motor vehicles and trucks could pose a hazard. Consideration should be given to parking work vehicles within the coned area between the work area and oncoming traffic. Guidance on properly coning and flagging the work area is presented in URS SMS 032, Work Zone Traffic Control.

Use of Personal Protective Equipment

The personal protective equipment (e.g., protective clothing and air purifying respirators) which may be required for some activities for this Project places a physical strain on the wearer. When personal protective equipment (PPE) such as respirators, gloves and protective clothing are worn, visibility, hearing and manual dexterity are impaired. URS SMS 029, Personal Protective Equipment, presents additional information on this subject.

Heat Stress

Hot weather can cause physical discomfort, loss of efficiency and personal injury. Work which is conducted when temperatures exceed 70 degrees Fahrenheit (°F) may result in increased incidence of heat-related illness. The risk is increased for personnel who are required to don impermeable protective clothing during warm weather, which decreases the body's natural cooling processes. Fluids will be provided at regular intervals during the work periods in order to maintain adequate body fluid levels for the field personnel.

URS SMS 018, Heat Stress, presents additional information on this subject. This SMS describes heat stress identification, treatment, prevention and monitoring.

Cold Exposure

Cold weather can cause physical discomfort, loss of efficiency and physical injury. Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body, or result in profound generalized cooling, causing death. Areas of the body which have high surface area-to-volume ratio such as fingers, toes and ears are the most susceptible.

Exposure to cold working conditions can result in cold stress (i.e., hypothermia) and/or injury (frostbite) to hands, feet, and head. Hypothermia can result when the core body temperature drops below 96.8°F. Lower body temperature will be likely to result in dizziness, drowsiness, disorientation, slurred speech or loss of consciousness, with possible fatal consequences. Pain in the extremities may be the first warning of danger from cold stress. Shivering develops when the body temperature falls to 95°F. Hypothermia can be brought on by exposure to cold air, immersion in cold water, or a combination of both. The wind chill factor, which is the cooling power of moving air, is a critical factor in cold stress.

Workers must wear adequate insulating clothing if work is performed in temperatures below 40°F. At temperatures of 35.6°F or less, workers whose clothing becomes wet will be provided immediately with a change of clothing and, if necessary, treated for hypothermia. Treatment includes warming the victim (with skin-to-skin contact or by providing warm blankets or other coverings) and providing warm liquids for the victim to drink. Skin exposure will not be permitted at temperatures of -25°F or below.

If fine work is to be performed with bare hands for more than 10 to 20 minutes at temperatures below 60°F, provisions will be made for keeping the workers' hands warm. If equivalent chill temperatures fall below 40°F and fine manual dexterity is not required, gloves will be worn. Metal handles of tools will be covered with insulating material at air temperatures below 30°F.

If work is to be performed continuously in the cold when the wind chill factor is at or below 19°F, heated warming shelters (e.g., tents, trailers, vehicle cabs) will be made available nearby.

URS SMS 059, Cold Stress, presents additional information on this subject. This SMS presents the effects of cold exposure, and treatment, prevention and monitoring procedures.

5.5 BIOLOGICAL HAZARDS

Potential biological hazards include illnesses and/or injuries transmitted by plants, insects, animals and pathogenic agents. There are many plants, animals and insects that are potentially harmful to humans including ticks, poison ivy/poison oak, spiders, bees and wasps, mosquitoes and poisonous snakes.

Bloodborne pathogens include diseases that can be transmitted by contact with blood or other bodily fluids as well as contaminated items that may be encountered on the Site (e.g. used syringes). Universal precautions should be used when administering First Aid. Good hygiene practices and proper decontamination of nondisposable PPE will minimize potential for transmission of bloodborne pathogens.

During field work at the Site, personnel may encounter a wide variety of insects including bees, mosquitoes, ticks and spiders. Field personnel are encouraged to use insect repellent when insects are present. Stings of bees and wasps may cause serious allergic reactions in certain individuals. The SSO should be made aware of all personnel with known insect allergies or sensitivities before field work begins.

Ticks are parasites that feed on the blood of an animal/human host and can carry several severe diseases, the least bringing several days of fever and pain and the worst causing brain damage. Deer tick bites may result in the transmission of Lyme Disease. A characteristic rash may develop a few days to a few weeks after the bite of an infected tick. The rash generally looks like an expanding red ring with a clear center, but it can vary from a blotchy appearance to red throughout the rash. However, it is important to note that some victims never exhibit a rash. Lyme Disease symptoms include flu-like symptoms such as a headache, stiff neck, fever, muscle aches and/or general malaise. Long-term effects of Lyme Disease may include arthritis of the large joints, meningitis, neurological complications (such as numbness or tingling of the extremities, loss of concentration and memory retention or Bell's Palsy), withdrawal and lethargy, or cardiac symptoms. Site workers should use the following prevention tactics in accordance with URS SMS 047, Biological Hazards, contained in Appendix B. Other suggested behaviors to reduce the hazards posed by ticks include:

- avoid walking through brush, woods or grassy areas; try to avoid contact with plants if you must walk through these areas;
- dress in light-colored clothing to make adhering ticks more visible. Wear long-sleeved shirts and tuck pants into socks. Wear a hat and tie back long hair;
- use a tick repellent containing permethrin or DEET; and,
- perform self or assisted searches each day to check for ticks.

Pigeon nesting and roosting habits may result in an accumulation of excrement at some sites. Exposure to pigeon excrement can cause illness in humans. Of primary concern is the contracting of psittacosis which is a flu-like illness which can cause death in vulnerable individuals. All workers should avoid coming in contact with these materials and, if exposed to them, should thoroughly wash areas of contact as soon as possible.

Assume that all animals are dangerous. A person who is bitten by an animal may become infected by tetanus or rabies. Warm-blooded animals such as dogs, cats and rats can transmit rabies. Rabies can also be transmitted when the saliva of an infected animal contacts an open wound (even a scratch) or any normal body opening such as the mouth or eye.

URS SMS 047, Biological Hazards, presents additional information on this subject.

5.6 FLAMMABLE HAZARDS

Flammable hazards are expected to be low during the course of this work based on the levels of flammable materials encountered during previous investigations at the Site and the nature of the work to be performed. However, as a precaution, air monitoring, as specified in Section 6, will be conducted during all work activities. URS SMS 014, Fire Prevention, presents additional information on this subject.

5.7 EXPOSURE ROUTES

The primary exposure pathways of concern for these identified contaminants are as follows:

Inhalation of Dust

Several of the work activities to be performed have the potential for generating dust in the breathing zone. Dust suppression techniques will be used as required to reduce airborne exposures.

Inhalation of Volatile Contaminants

Several VOCs may be present in the soil and groundwater. Previous experience during activities at this site and at other sites suggests that airborne concentrations of these contaminants during these activities will probably not exceed exposure limits during activities due to emissions from contaminated soil or groundwater, or gasoline or diesel fuel-powered equipment in open areas.

Ingestion of Contaminants

Personnel may be exposed to accidental ingestion of contaminants by hand to mouth contact after contact with contaminated materials. Ingestion of contaminants will be controlled during work activities by prohibiting eating and smoking in the contamination reduction zone and exclusion zone and by requiring all field personnel to decontaminate themselves upon leaving the exclusion zone. Drinking of liquids will take place only after partial decontamination has taken place (except in a heat stress emergency situation).

Skin and Eye Contact with Contaminants

Skin and eye contact with some of the contaminants at the Site or due to the operation of gasoline or diesel fuel-powered equipment may cause skin or mucous membrane irritation. Many of these contaminants can be absorbed into the bloodstream through the skin or eyes. Skin contact with potentially contaminated materials will be reduced by the wearing of personal protective clothing. Any body area which comes in contact with contaminants will be washed with soap and rinsed immediately. All field personnel will report any skin or eye contact symptoms to the SSO. The person will be treated by a physician and steps will be taken to eliminate similar exposures.

5.8 CONTROL OF EXPOSURE TO CHEMICAL HAZARDS

Potential hazards will be reduced by protecting against exposures to contaminants via utilization of appropriate personal protective equipment. Personal protective equipment to protect the body against contact with known or anticipated chemical hazards is divided into five levels of protection categories (i.e., Levels A, B, C, Modified D and D personal protective equipment) according to the degree of protection afforded. The initial levels of personal protective equipment to be used while performing the work activities described in Section 4 are discussed in Section 7, Site-Specific Health and Safety Requirements. If the personal protective equipment for any level of protection needs to be modified to be appropriate for the specific hazard encountered, an appropriate addendum to this HASP must be prepared by the HSM.

Periodic air monitoring will be employed to assess respiratory hazards in the work zones for work activities as appropriate. Levels of protection can be upgraded or downgraded by the SSO if they are not appropriate; the HSM will be notified of any changes of levels of protection as soon as practical.

6.1 SAFETY TRAINING

Employees shall not participate in field activities until they have been trained to a level required by their job function and responsibility. Trainers shall have received a level of training higher than and including the subject matter of the level of instruction they are providing. All training and field experience shall be certified. Training requirements are discussed below.

All personnel working in any contamination reduction zone or exclusion zone exposed to hazardous substances, or health or safety hazards shall be thoroughly trained as specified in OSHA Regulation 29 CFR Part 1910.120(e). This training program will include:

40-Hour Initial Training

All field employees must have completed the 40-hour (hr) initial health and safety training required under OSHA Regulation 29 CFR Part 1910.120. They must receive an 8-hr annual refresher training thereafter.

Three-Day On-Site Supervision

All field employees shall be required to receive a minimum of three-days of on-site training under the supervision of a trained and experienced supervisor. On-site time under supervision shall be documented.

Site Supervisor

The Site Supervisor (URS Project Manager or designated alternate) must have completed the basic 40-hr training course, three days of on-site supervision, and at least 8 hours of specialized training on managing hazardous waste operations. The eight hours of specialized training shall include instruction covering the URS Health and Safety Program, employee training program, personal protective equipment program, spill containment procedures and health hazard monitoring procedures and techniques.

Site Safety Officer

The SSO must have completed 40-hr training, 3-day on-site supervision and first aid training. A first aid refresher is required every three years. Any other on-site personnel trained to do first aid will be identified during the Daily Site Safety Briefings.

Personnel involved in any of the work activities designated for this project may also be required to meet other applicable OSHA Regulations or Standards.

OSHA Regulation 29 CFR 1910.120 require that special training be provided at the time of job assignment to personnel who may be exposed to unique or special hazards not covered by the initial 40-hr basic health and safety course. It is not anticipated that any unique or special hazards will be encountered during this project, other than those previously described; therefore, special training will not be needed. If unique or special hazards are unexpectedly encountered, specialized training must be provided.

Contractors must provide documentation and certificates indicating that their field personnel working within the contamination reduction zone or exclusion zone have successfully completed all the training requirements stipulated under OSHA Regulations 29 CFR Part 1910.120 and 29 CFR Part 1926 and that they have been successfully fit-tested within the previous 12 months for the brand, size and type of respirator to be used.

An individual that either refuses to or cannot produce a record of course completion will be prohibited from participation in field activities. An individual that refuses to or cannot produce a satisfactory fit-test record will be prohibited from wearing respiratory protection.

URS SMS 055, Health and Safety Training, presents additional information on this subject.

6.1.1 Safety Orientation Meeting

A safety orientation meeting will be conducted for all employees, including contractors, prior to the commencement of field activities. The following topics will be discussed at this meeting:

- names of health and safety personnel and alternates responsible for site health and safety;
- health and safety organization;
- hazards at the Site;
- exposure risk;
- required work procedures including, but not limited to, lockout and tagout, excavation safety, and confined space entry, as applicable;
- personal protective equipment to be used;
- respiratory protection;
- personnel and equipment decontamination procedures;
- air monitoring; and,
- emergency procedures.

All field personnel must be provided with and read a copy of this HASP. At the end of the meeting, attendees will be informally quizzed to assess their understanding of the health and safety requirements. They must sign a safety compliance agreement form stating they have read, understand and agree to comply with the provisions of the HASP. Anyone refusing to sign the form will be prohibited from working at the Site.

If a new employee, who has not gone through the site-specific safety orientation meeting is assigned to the Site, the SSO must present a similar briefing to the new employees before he/she participates in any field activities. All new employees must sign the safety compliance agreement form before beginning field work.

6.1.2 Daily Safety Briefings

During field operations, daily safety briefings must be held at the start of each work shift by the SSO to review and plan specific health and safety aspects of scheduled work. Topics discussed during these briefings will include site hazards, precautions, lockout and tagout procedures (as necessary), PPE, air monitoring, respiratory protection, decontamination and applicable procedures for the work activities to be conducted during that work shift. All site personnel who are following this HASP and working within the contamination reduction zone or exclusion zone are required to attend these briefings. Names and affiliations of individuals attending these briefings and items discussed must be documented by the SSO.

6.1.3 Site Inspections

The Site Manager or SSO is to conduct a daily site inspection prior to the start of each shift. It is the responsibility of the URS Project Manager or Site Manager to resolve discrepancies immediately, contacting the HSM, if necessary, for assistance. Inspections are to be documented and maintained at the Site until the completion of the Project, at which time they are placed in the project files.

6.1.4 Hazard Communication Program

Materials that are considered hazardous under the OSHA Communication Standard (i.e., OSHA Regulation 29 CFR 1910.1200) may be brought to the Site (e.g., acids for sample preservation). Field personnel, including Contractors, must comply with the requirements of the OSHA Hazard Communication Standard. MSDSs or Safety Cards must be available at the Site for all applicable materials. Data on these materials must be presented as part of the safety orientation meeting. The SSO is responsible for maintaining an MSDS/Safety Card file for these chemical constituents and for all materials which are brought to the Site. Personnel shall receive training for safe use of these materials during safety orientation meetings and daily site safety briefings, as required. URS SMS 002, Work Right-to-Know (Hazard Communication), presents additional information on this subject.

6.1.5 Site Security

- Access to the Site will be controlled.
- Only authorized personnel shall be permitted to enter work areas. No one shall enter the work area without appropriate authorization.
- All persons entering the work area shall be equipped with appropriate PPE.
- All personnel entering the contamination reduction zone or exclusion zone must be familiar with and abide by the HASP. All of these individuals must have signed the Health and Safety Plan Compliance Agreement form.

6.1.6 Underground Structures/Obstructions/Utilities

Before any intrusive work, a “call-before-you-dig” service will be requested to provide utility mark outs for the Site. Caution must be exercised whenever the possibility of encountering unexpected subsurface structures/obstructions/utilities exists. Before beginning intrusive activities, all available sources of information (e.g., site utility drawings, public utility drawings, construction drawings and contract documents) will be reviewed. Work will proceed only when identified subsurface structures/obstructions/utilities are clearly marked in the field. Controlled excavation will be performed to expose known structures/obstructions/utilities, until the area has been opened sufficiently to utilize mass excavating techniques. Borings or excavations will not be conducted at locations of close proximity to existing utilities until the area has been hand excavated or jetted to a depth of 4 ft, or as specified on the contract documents. If underground structures/obstructions/utilities are unexpectedly encountered, the area will be excavated using manual equipment until the nature of the obstruction is discerned and appropriate precautions taken. Additional information about this subject is contained in URS SMS 034, Utility Clearances and Isolation.

6.2 MEDICAL SURVEILLANCE

All employees involved in field activities shall be active participants in the URS medical surveillance program or the equivalent. All medical examinations and procedures shall be performed by or under the supervision of a physician who is board eligible or board certified in occupational medicine.

Before commencing any of the activities defined in Section 4, all personnel must take an entry medical examination and periodic medical examinations as required by OSHA Regulation 29 CFR 1910.120(f) as part of a medical surveillance program. Contractors involved in field activities must provide documentation of medical examinations for their employees.

Medical surveillance is a major component of all health and safety programs. It was established to monitor and promote the health of employees engaged in projects which have the potential for exposure to hazardous substances. Exposure to chemicals has the potential to cause adverse health effects although the use of recognized safety procedures and protective equipment substantially mitigates associated risks. In the event a potentially harmful exposure occurs, early detection of symptoms is extremely important to successful treatment. Thus, the medical surveillance procedures prescribed as part of this health and safety program must be followed by all relevant personnel without exception.

Medical surveillance provides a clinical base of information that is used to evaluate an employee’s fitness to work on a hazardous waste site, to identify anomalies in a person’s medical history that may be related to potential impaired health, and to evaluate a person’s capability to use respiratory protective equipment. This base of medical information includes personnel health history, exposure history, physical examination results, laboratory analyses and results of screening and special tests.

Medical examinations must include (at a minimum):

- Past medical history - on entry to the program, information concerning past occupational and personal as well as family history of disease.
- Present medical profile - all pertinent medical information regarding present state of health and during each year of field work in hazardous material projects.
- Exposure history - information concerning the cumulative duration of time spent on potentially hazardous sites, the primary toxic substances, and the levels of protection employed by each site.
- Kidney and liver function tests - possible exposure to aromatic hydrocarbons warrant examination of the liver enzymes and blood exams to evaluate kidney and liver function.
- Hematology - complete blood-forming function exams including complete blood count, white blood count, red blood count and hemoglobin exams.
- Urinalysis.
- Physical examination.
- Hearing test.
- Vision test.
- Pulmonary function test.

Optional tests, if recommended by the examining physician for this specific site, could include:

- Electrocardiogram.
- Radiography (X-ray Examinations).
- Special tests - medical information concerning the effects of exposure to specific contaminants.

The objectives of the medical surveillance component of the health and safety program are:

- Protect the health of employees assigned to work on sites containing potentially hazardous substances.
- Pre-assignment screening of employee's health to determine present status and to identify existing problems that may be aggravated by chemical exposure or physical stress.
- Monitor employee's health for early signs of work-related illness and employee suitability for further assignments on sites containing potentially hazardous substances.
- Evaluation and care of individuals with work-related illnesses or injuries.
- Satisfy the requirements of OSHA Regulation 29 CFR Part 1910.134 regarding respiratory protection and OSHA Regulation 29 CFR Part 1910.120 for hazardous waste workers.

Examining physicians will use information provided by the employee in the questionnaire, the examination results, and the results of laboratory tests to determine if any work restrictions (e.g., medical fitness to wear respiratory protection during work activities) or occupational health problems appear to be present. Contractors must provide documentation indicating that their field personnel working within any contamination reduction zone or exclusion zone are active participants in good standing in a medical surveillance program and are medically fit to wear a respirator.

An individual that either refuses to or cannot produce documentation of active participation in good standing in a medical surveillance program or medical fitness to wear a respirator will be prohibited from participation in field activities or wearing of respiratory protection, respectively.

URS SMS 024, Medical Screening & Surveillance, presents additional information on this subject.

6.3 INJURY/ILLNESS/INCIDENT REPORTING

In the event of an injury or incident, the SSO will immediately notify the URS Project Manager and HSM. Types of injuries, illnesses or incidents considered reportable are as follows:

- illness resulting from chemical exposure or unknown causes;
- near misses;
- physical injury including scratches and/or abrasions;
- fire, explosions and flashes resulting from activities performed by URS or contractors;
- infractions of safety rules and requirements; and,
- unexpected chemical exposures.

Work will be suspended to correct the cause of the injury/illness/incident and to modify this HASP, as necessary.

A URS Injury/Illness/Incident Report form must be submitted to the URS Project Manager and HSM within 24 hours of occurrence. The URS Project Manager will be responsible for informing the Client of any accidents/illnesses/incidents reported by site personnel. URS SMSs 049, Injury/Illness/Incident Reporting & Notifications, and 065, Injury and Claims Management and present additional information on this subject.

6.4 VISITOR CLEARANCES

All visitors entering the contamination reduction zone (CRZ) or exclusion zone (EZ) at the Site will be required to read and verify compliance with the provisions of this HASP. All visitors must provide their own personal protective equipment unless specifically authorized by the URS Project Manager to don URS-supplied personal protective equipment. Documentation of site visitor registration and training will be maintained on the Project Safety Log forms found in Section 11.

In the event that a visitor does not adhere to the provisions of the HASP, he/she will be requested to leave the Site. All nonconformance incidents will be recorded on the Project Safety Log form.

6.5 BUDDY SYSTEM

Unless the requirements of URS SMS 084, Lone Worker, are strictly complied with, the “buddy system” will be used during all field activities. Under the “buddy system,” at no time will an individual enter or leave an EZ alone. Before entering an EZ, each individual will identify his/her “buddy.”

6.6 PROJECT SAFETY LOGS

Project Safety Log forms (Section 11) will be maintained by the SSO throughout the Project and provided to the URS Project Manager after the Project is completed. Logged information shall include: (1) names of all URS, Client, visitor and Contractor personnel entering and leaving the Site each day, (2) dates each major field activity started and was completed, (3) air monitoring data, (4) description of unforeseen hazards and steps taken to mitigate these hazards, (5) summary of telephone conversations regarding health and safety, (6) safety infractions, if any, (7) accidents, near misses and injuries, if any, and (8) all other significant health and safety items.

6.7 CONTROLLED AREA

A controlled area is defined as an area within which all entry and activities are regulated by URS because of activities underway in that area. Rationale for the establishment of a controlled area would include the need to control exposure of URS and non-URS personnel to any anticipated hazards, and to protect URS personnel from the consequences of non-URS operations at the Site.

Barricade tape and/or barricades will be used to delineate the controlled area for safety purposes around the work area. The barriers will be set in a 15-ft or greater (as necessary and/or practical) radius around the work area to provide sufficient maneuvering space for personnel and equipment. A short piece of barricade tape can be affixed to a secure upright (e.g., a drill rig mast or a vehicle antenna) to serve as an indicator of wind direction. A 5-ft wide opening in the barricades at the support zone (upwind of the work area) will serve as the personnel and equipment entry and exit point.

The personnel decontamination station will be established at this point if formal decontamination procedures are required. All entry and exit from the work area will be made at this opening to control potential sources of contamination; contaminated soil and debris must be confined to the work area.

At the end of the shift, all boring/sampling holes must be covered or otherwise secured. All cuttings and decontamination fluids are to be handled in accordance with relevant regulations and instructions from the URS Project Manager.

The Site Manager or SSO will determine an upwind evacuation area prior to each shift, and all personnel will be notified of its location. A horn or other signaling device will be used to signal an evacuation in the event of an emergency. Three blasts of the horn will be the signal to immediately stop work and proceed to the evacuation area.

6.8 WORK ZONES

Field personnel will establish three work zones around each work activity: the exclusion zone, the contamination reduction zone and the support zone.

6.8.1 Exclusion Zone

The EZ is the area where contamination is or may be present. All individuals entering this area must be approved by the SSO. Access control points will be established at the periphery of the EZ to regulate the flow of personnel and equipment into and out of the EZ. Initially, the EZ will extend a distance of 15 ft from the edge of intrusive activity unless conditions at the Site warrant either a larger or smaller distance as determined by the SSO. All persons entering the EZ will wear the applicable PPE. It is anticipated that EZ will be established at each individual area of intrusive work rather than encompass the entire Site.

6.8.2 Contamination Reduction Zone

The CRZ is established outside the EZ to minimize the migration of contaminants from the EZ to clean or support areas, and to reduce the exposure potential of individuals leaving the EZ. All personnel must decontaminate as appropriate when leaving the EZ. A CRZ will be established adjacent to each individual area of intrusive work. The CRZ will be delineated by using warning tape, snow fence and/or traffic cones in addition to posting directions (to exit and enter the EZ) and signs, as appropriate, at the discretion of the SSO. No one will be permitted into the CRZ or EZ unless he/she is in full compliance with the requirements of this HASP.

6.8.3 Support Zone

The support zone is the outermost part of the work area and is located in a clean area, preferably upwind and immediately outside of the CRZ, or in the on-site vehicles. Supplies, emergency equipment, vehicles and support personnel are located in the support zone. Normal work clothes are appropriate within this zone. The location of the support zone depends on factors such as accessibility, wind direction (if possible, it should be located upwind of the work area) and the presence of on-site resources (e.g., roads, shelters and utilities).

6.9 FIELD ACTIVITIES**6.9.1 Personnel Requirements/Prohibitions**

- No running or “horseplay.”
- The required level of personal protective equipment must be worn by all on-site personnel.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the EZ and the CRZ; drinking of water, Gatorade® or equivalent fluids may occur in the CRZ at the discretion of the SSO. Fluids for consumption in the CRZ will be prepared outside the CRZ by a thoroughly decontaminated person and supplied to personnel inside the CRZ using disposal cup with lids and straws such that hand-to-mouth transfer of potential contaminants will be prevented.
- Smoking, carrying lighters and/or matches is prohibited in the EZ and in the CRZ.
- No contact lenses may be worn by personnel engaged in field work requiring respirators.
- No jewelry (including rings) may be worn by personnel engaged in field work except watches which will be disposed of if they become contaminated.
- Facial hair that interferes with a satisfactory fit of the respirator mask-to-face seal is not allowed on personnel required to wear air purifying respirators.
- Medicine and alcohol can increase the effects of exposure to toxic chemicals; personnel taking any prescribed drugs must inform the SSO of this fact. They shall not be assigned to operations where the potential for absorption, inhalation or ingestion of toxic substances exists unless specific approval has been obtained from a qualified physician. Alcoholic beverage intake will not be allowed during breaks.
- No person will enter the EZ alone.
- Safety devices on equipment must be left intact and used as designed.
- Equipment and tools will be kept clean and in good repair and used only for their intended purpose.
- Eye protection must be worn when any hammering or pounding may produce flying particles or slivers.
- Leather gloves must be worn when handling objects that may produce slivers (e.g., wooden stakes).
- Whenever possible, field personnel should work from a position upwind of sources of exposure to contaminants.

- All persons entering and/or working in the CRZ or EZ will read, sign and become familiar with this HASP. A copy of the HASP will be available at the Site through the SSO.
- Field personnel will not be allowed in the CRZ or EZ without the prior knowledge and consent of the SSO.
- Field personnel will use the “buddy system” (i.e., working in pairs) when in the CRZ or EZ unless the requirements of URS SMS 084, Lone Worker, are being followed. Buddies shall prearrange hand signals for communication. Visual contact shall be maintained between crew members at all times. Crew members must observe each other for signs of toxic exposure. Indication of adverse effects include, but are not limited to:
 - changes in complexion and skin discoloration;
 - changes in coordination;
 - changes in demeanor;
 - excessive salivation and pupillary response; or,
 - changes in speech pattern.

Also, employees shall inform each other of non-visual effects of toxic exposure such as:

- headaches;
 - dizziness;
 - nausea;
 - blurred vision;
 - cramps; or,
 - irritation of eyes, skin or respiratory tract.
- All field personnel will bring to the attention of the SSO or Site Manager any unsafe condition or practice associated with work activities that they are unable to correct themselves.
 - Contaminated PPE (e.g., respirators and boots), and other equipment and supplies will not be removed from the CRZ or EZ until they have been cleaned, or properly packaged and labeled.
 - Hands will be thoroughly cleaned prior to smoking, drinking, eating or other sanitation activities.
 - Team members must avoid unnecessary contamination (e.g., walking through known or suspected “hot” zones or contaminated puddles, kneeling or sitting on the ground, and leaning against potentially contaminated drums or equipment).
 - Legible and understandable precautionary labels shall be affixed prominently to containers of contaminated scrap, waste, debris and clothing.
 - Removal of contamination from protective clothing or equipment by blowing, shaking or any other means which disperses contaminants into the air is prohibited.
 - Containers shall be moved with proper equipment only. Containers shall be secured to prevent dropping or loss of control during transport.

- Emergency equipment shall be located in storage areas in readily accessible locations which will remain minimally contaminated in an emergency.

6.9.2 Contamination/Exposure Prevention

Ways in which on-site personnel may become contaminated include the following:

- being splashed by contaminated liquids while sampling or handling liquids;
- coming in contact with contaminated solids or liquids;
- walking through contaminated materials, either in solid or liquid state;
- being in contact with contaminated equipment;
- being in contact with contaminated solid substances in waste piles or on the soil surface;
- sitting or kneeling on the ground; and,
- being splashed by or coming into contact with analytical sample preservation chemicals and/or decontamination chemicals.

Field personnel will avoid becoming contaminated as much as possible.

Field personnel will avoid exposure to hazardous chemicals by strictly adhering to the required personal protective equipment and decontamination procedures.

Care will be taken to prevent equipment contamination as much as possible. Sampling and monitoring equipment will not be placed on contaminated surfaces. Monitoring equipment that cannot be easily decontaminated will be bagged, and the bag taped and secured around the instrument. Openings will be made in the bag for sample intake and exhaust ports.

6.9.3 Equipment Operation

The following information warrants extra attention regarding work around equipment (e.g., generators) and heavy materials:

- Use common sense.
- Hard hats, steel-toed work boots and safety glasses must be worn.
- Pay attention at all times.
- Maintain visual contact at all times.
- All mobile equipment must have backup alarms as specified by OSHA Regulation 29 CFR Part 1926.601.
- Only qualified persons are to operate equipment.
- Never walk directly in back of or to the side of mobile equipment without the operator's knowledge.

- Never use a piece of equipment unless you are familiar with the operation; this applies to light as well as heavy equipment.
- Hearing protection will be provided, if requested by an employee, and is required any time noise levels exceed 85 dBA (8-hour average) or 100 dB peak (impact/impulse).
- Be sure that underground and overhead power lines, sewer lines, gas lines and telephone lines have been identified and that they will not present a hazard in the work area.
- Wear high visibility vests during low light conditions and in areas subject to vehicular traffic. Additional information about working in traffic areas is presented in URS SMS 032, Work Zone Traffic Control.

All work involving hand tools and portable equipment must be performed in accordance with URS SMS 016, Hand Tools and Portable Equipment.

6.9.4 Heavy Materials and Drum Handling Safety

The following are guidelines to follow when working with heavy materials:

- be aware of footing at all times;
- use chains, hoists, straps and any other equipment to safely aid in the moving or lifting of heavy objects/materials;
- use your legs, not your back;
- get help whenever in doubt about a material's weight; and,
- use the "buddy system."

Additional information concerning working with heavy materials is presented in URS SMS 069, Manual Material Handling.

6.9.5 Safety Precautions when Sampling

All personnel engaged in sampling operations shall wear safety glasses or goggles, chemical-resistant steel-toed work boots and hard hats (if overhead hazards are present or whenever equipment, e.g., geoprobe rig or excavator is operating), and hearing and respiratory protection (if required). Because tools and equipment can create major hazards at sites, the following procedures are to be followed during these work activities:

- hard hats are required when working near overhead hazards and during drilling operations;
- goggles, safety glasses or face shields, as appropriate, will be worn when operating power tools;
- gloves are required to protect hands;
- no loose-fitting clothing, jackets with hoods, jewelry or free long hair is permitted near operating equipment;

- hands must be kept away from the moving parts of machinery when operating;
- a first-aid kit and appropriately-sized fire extinguisher will be available at all times;
- all crews will consist of at least two people, one of which will include a SSO or designated field team member, to monitor activities unless the requirements of URS SMS 084, Lone Worker, are being followed.
- no sampling will occur during impending electrical storms or when rain or icy conditions create a work hazard; and,
- keep clear of any overhead power lines.

6.9.6 Housekeeping

Housekeeping is a very important aspect of an investigation program and will be strongly stressed in all aspects of field work. Good housekeeping plays a key role in occupational health protection and is a way of preventing dispersion of dangerous contaminants. All work areas will be kept as clean as possible at all time and spills will be cleaned up immediately. Housekeeping will be the responsibility of all employees.

To minimize the spread of contamination beyond the work site, URS will implement a housekeeping program for field activities. The program will include:

- checking the work area at the end of each work day to ensure that tools, chemicals, etc. are properly secured and that all work is properly containerized;
- changing of wash and rinse water for hands, face and equipment when the water becomes visibly dirty; and,
- periodic (daily minimum) removal of all garbage bags and containers used to dispose of food products, plastic inner gloves and contaminated disposable clothing.

URS SMS 021, Housekeeping, presents additional information on this subject.

6.9.7 Sanitation

Potable Water

- An adequate supply of potable water will be provided.
- Portable containers used to dispense drinking water will be capable of being tightly closed and equipped with a tap. Water will not be “dipped” from the container.
- Containers used to distribute drinking water will be clearly marked and not used for any other purpose.
- When single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups will be provided.

Non-Potable Water

- Outlets for non-potable water will be identified to clearly indicate that the water is unsafe and is not to be used for drinking, washing or cooking purposes.
- There shall be no cross-contamination (open or potential) between potable and non-potable water systems.

Toilet Facilities

Due to infrequent visitation of project personnel, a portable restroom is not required. Project personnel will seek restroom accommodations at local establishments. Portable hand washing capability is available on-site and shall be maintained by project personnel under oversight by the SSO

Toilet facilities shall be provided for employees as follows:

<u>Number of Employees</u>	<u>Minimum Number of Facilities</u>
20 or fewer	One toilet seat
More than 20, fewer than 200	One toilet seat and one urinal per 40 employees
More than 200	One toilet seat and one urinal per 50 employees

Food Handling

Food handling will not be permitted in the CRZ or EZ.

URS SMS 030, Sanitation, presents additional information on this subject.

6.9.8 Notifications

All field personnel must inform the SSO before entering the CRZ or EZ.

IF ANY PREVIOUSLY UNIDENTIFIED POTENTIAL HAZARDS ARE DISCOVERED DURING ANY FIELD WORK, LEAVE THIS AREA OF THE SITE IMMEDIATELY AND CONTACT THE SSO FOR FURTHER INSTRUCTIONS.

6.9.9 OSHA Information Poster

In accordance with the Occupational Safety and Health Act of 1970, a copy of the OSHA information poster must be present on all sites. This poster is provided in Appendix C. It should be posted at full size (11 inches x 17 inches) in the office trailer or other conspicuous area. If the Site does not have such a facility, it should be maintained in the field copies of the HASP.

6.10 PERSONAL PROTECTIVE EQUIPMENT

The level of PPE required for each of the tasks will be continually reevaluated as field work progresses. It is expected that there will be increases or decreases in the level of PPE

required for particular tasks. The PPE requirements for specific operations shall be agreed upon beforehand by the URS Project Manager, the HSM and the SSO. A document to that effect will be drawn up, dated and signed by the URS Project Manager and SSO. At site safety meetings, as required, the SSO shall inform field personnel of the PPE requirements and announce changes and justification for these changes. The HSM will publish a change to this HASP if PPE changes are permanent and if the HSM considers the changes substantive.

6.11 EMERGENCY EQUIPMENT

The following emergency equipment will be available at each location of intrusive activity:

- first aid kit;
- first aid directions; and,
- fire extinguisher (10-pound ABC minimum).

6.12 PERSONNEL DECONTAMINATION PROCEDURES

The SSO will be responsible for overseeing personnel decontamination. Personnel decontamination will be performed in a separate area from equipment decontamination. The CRZ will be located immediately outside the EZ. In this area, workers will:

- 1) wash and rinse outer gloves
- 2) wash and rinse outer boots or rubber boots (if required)
- 3) remove outer boots (if required)
- 4) remove outer gloves
- 5) remove Tyvek[®] coveralls (if required)
- 6) remove respiratory protection (if required)
- 7) remove inner gloves
- 8) wash and rinse hands and face

Decontamination procedures will be reviewed and revised, as necessary, by the SSO to be appropriate for the nature, level and extent of contamination. Decontamination for some work activities may be limited to visual inspection for contaminants prior to leaving work area.

Disposable PPE will be disposed of in drums located within the CRZ. The field activities described in this HASP are expected to be conducted over a time period not to exceed six months. If this situation changes at a later date and the planned field work is scheduled over a time period exceeding six months, showers will be made available to field personnel.

Personal decontamination procedures for personnel doffing Modified Level D/Level D PPE and Level C PPE are depicted in Figures 6 and 7, respectively.

6.13 LARGE EQUIPMENT AND VEHICLE, FIELD INSTRUMENT AND SMALL EQUIPMENT, AND OTHER EQUIPMENT DECONTAMINATION PROCEDURES**6.13.1 Decontamination of Large Equipment and Vehicles**

If determined to be necessary by the SSO, a decontamination pad will be constructed at the Site which will function as a wash down area for all large equipment and vehicles used in the EZ.

Large equipment and vehicles will be placed or driven onto the decontamination pad. Gross contamination will be removed through the use of shovels and/or brooms prior to large equipment and vehicles being washed with a high pressure, hot water washer, with cleaning agents being used on an as-needed basis to assist in the removal of contamination. All waters will drain to a collection basin.

Large equipment and vehicles will be held for a short period of time on the decontamination pad to allow for the wash water drippings and loose materials to be retained in the collection basin.

Personnel will don goggles and face shields while decontaminating large equipment and vehicles.

6.13.2 Decontamination of Field Instruments and Small Equipment

Field instruments should be decontaminated in accordance with the instructions of the manufacturer. Probes such as those used in pH and conductivity meters will be rinsed after each use with deionized water. When possible, instruments which are difficult to decontaminate (e.g., video cameras), may be protectively wrapped to reduce or eliminate the need for decontamination.

Small equipment will be decontaminated using appropriate portions of the personnel decontamination procedures.

6.13.3 Decontamination of Other Equipment

Generally only the tires of delivery trucks which have been in the EZ will need to be decontaminated (unless visual evidence of contamination is observed). This will be performed by spraying the tires and undercarriage with a high pressure, hot water washer, with cleaning agents being used on an as-needed basis to assist in the removal of contamination, before leaving the work area.

Only areas of large non-intrusive equipment (e.g., cranes) which have come into contact with potentially contaminated materials (e.g., tracks, undercarriage) require washing with a high pressure, hot water washer with cleaning agents being used on an as-needed basis to assist in the removal of contamination.

Personnel will don goggles and face shields during decontamination using a high pressure, hot water washer.

6.14 DISPOSAL OF DECONTAMINATION FLUIDS

Decontamination fluids will be disposed of in accordance with all applicable Federal, State and local requirements.

6.15 AIR QUALITY MONITORING INSTRUMENTATION

Air quality monitoring will be dependent on the specific operation, specific location and available data concerning that location. Personal air monitoring is conducted to provide real time warning of excessive exposure to contaminants and also to provide a characterization of personnel exposure for this work.

While performing field activities in the CRZ and EZ, air quality surveys must be performed and the results recorded. Several instruments which may be used to monitor air quality are discussed below:

- Photoionization Detector

The MiniRAE 2000 Model PGM Photoionization Detector (PID) with an 10.5 electron volt (eV) lamp or equivalent will be used to detect trace concentrations of certain organic gases and a few inorganic gases in the air. This PID was selected for the Project due to its ability to quantify the group of contaminants of concern at this Site (the ionization potential for other types of PIDs should be similar). A PID detects mixtures of compounds simultaneously. PID readings do not measure concentrations of any individual compound when a mixture of compounds is present. Concentrations of these chemical constituents are measured in parts per million (ppm).

The PID will be calibrated twice during each 8-hour work shift (i.e., before start of work and at the conclusion of work) using an isobutylene standard for calibration. Calibrations will be documented. PID readings must be measured in the breathing zone of the most highly exposed worker (i.e., closest to the source) at least each 30 minutes.

- Combustible Gas Indicator/Oxygen Meter

The Neotronics Exotox Model 40 Combustible Gas Indicator/Oxygen Meter (CGI) or equivalent will be used at the discretion of the SSO to measure the concentration of flammable vapors and gases, oxygen and carbon monoxide in the air during field activities. Flammable gas concentrations are measured as percentages of the Lower Explosion Limit (LEL). Oxygen content is measured as a percentage of total air. Carbon monoxide concentration is measured in ppm.

- Multigas Detector Tubes

Draeger Multigas Detector Tubes or equivalent will be used at the discretion of the SSO to detect and quantify the concentration of selected contaminants in air. The detector tubes to be employed must be sensitive in the concentration ranges in the OSHA Permissible Exposure Limit (PEL) range for those contaminants. It should be

realized that most “compound specific” detector tubes also detect other aromatic or aliphatic hydrocarbons; readings do not differentiate between which compounds are present.

The tube readings will be compared to OSHA PELs to determine what level of protection is required. If PID or readings are elevated when compared to background (i.e., 5 ppm or more above background) or if phase product and/or odorous material are detected.

The detector tube readings should be compared to OSHA PELs to determine which level of PPE is required. Information concerning the use of detector tubes, including the reasons for use, results of readings and actions taken, will be thoroughly documented in the Project Safety Log form.

- Personal Monitor for Aerosol and Dust

The MIE, Inc. Model PDM-3 MiniRam Personal Monitor for Aerosol and Dust or equivalent will be used at the discretion of the SSO to detect and quantify the concentration of aerosols and fugitive dust that may be created during work activities.

The Personal Monitor for Aerosol and Dust must be calibrated twice daily (i.e., before start of work and at the conclusion of work).

6.16 AIR QUALITY MONITORING PROGRAM

6.16.1 Air Quality Monitoring Locations and Frequency

Air quality monitoring will be initially performed using a PID or Personal Monitor for Aerosol and Dust (if necessary) at least each 30 minutes in the breathing zone of the most highly exposed worker (i.e., closest to the source) at the Site. All air quality measurements, with the exception of CGI measurements for flammable vapors and gases, should be made in the breathing zone of personnel who, in the opinion of the SSO, are most exposed to airborne contaminants. Measurements of flammable vapor and gas levels should be made in the vicinity of the nearest ignition source.

When air quality monitoring is performed using a CGI, measurements will be made at least every 30 minutes in areas where flammable conditions, oxygen deprivation or enrichment, and/or elevated levels of carbon monoxide may develop.

Air quality monitoring frequencies and locations using these and other instruments may be modified by the SSO based on actual field conditions.

6.16.2 Determination of Background Levels of Organic Vapors, and Aerosols and Fugitive Dust

Background levels for the purpose of evaluating PID and Personal Monitor for Aerosol and Dust readings will be taken at least twice per work shift (i.e., before start of work and at the conclusion of work). Background levels will be taken in an area free of contaminants. Once work at the Site commences, alterations may require relocation of the originally established

background measurement area. Although background measurements will be taken, air quality monitoring response levels, as shown in Table 2, are not to be effected by these measurements unless background contaminants are identified and an Addendum addressing this issue is prepared by the HSM.

6.16.3 Initial Levels of Protection and Air Quality Monitoring Response Levels

A number of response levels will be used during field work if airborne contaminants are encountered during air monitoring. The HSM will be notified as soon as possible of upgrading from the initial levels of protection. Initial Levels of Protection and response levels applying to the field activities covered by this HASP are contained in Table 2.

6.17 HEAT STRESS MONITORING

To ensure operational and personal safety of field personnel, initial heat stress monitoring for workers wearing protective clothing will be conducted based on the following table. Additional information on heat stress is included in URS SMS 018, Heat Stress.

ADJUSTED TEMPERATURE	TIME INTERVALS FOR HEAT STRESS MONITORING
90°F or above	After each 15 minutes of work
87.5 to 90°F	After each 30 minutes of work
82.5 to 87.5°F	After each 60 minutes of work
77.5 to 82.5°F	After each 90 minutes of work
72.5 to 77.5°F	After each 120 minutes of work

6.18 COLD STRESS MONITORING

Persons working outdoors in temperatures at or below freezing may be frostbitten. Areas of the body most susceptible are the extremities. Workers should be aware of loss of feeling in these areas. A more serious form of cold stress is hypothermia. This results when the body loses heat faster than it can produce it and can result in death. Cold stress procedures are discussed in URS SMS 059, Cold Stress.

6.19 WORK DURING DARKNESS

Work may be performed at times when low light conditions exist. If the level of lighting impacts safety of work operations, work must cease until appropriate procedures can be established. Adequate illumination (i.e., a minimum of 5 foot-candles throughout the work area) will be provided using lanterns and/or spotlights to enable personnel to conduct their work. Each work crew will consist of a minimum of two individuals.

All illumination will meet the requirements of OSHA Regulation 29 CFR Part 1910.120(m).

6.20 CONFINED SPACE WORK

Confined space entry is not anticipated for the work activities authorized by this HASP. Should actual work procedures require that confined spaces be entered, an addendum to this HASP must be prepared by the HSM and approved by the URS Project Manager and the HSM. This addendum will require that work be performed in accordance with all applicable OSHA regulations including OSHA Regulation 29 CFR Part 1910.146 and applicable URS SMSs.

6.21 HOT WORK

No hot work (e.g., use of torches or welders, and open flames) is anticipated to be necessary for the scope of work covered by this HASP. If hot work is required, an addendum to this HASP must be prepared in accordance with applicable URS SMSs.

6.22 MITIGATIVE MEASURES FOR CONTROL OF EMISSIONS

Based on previous experience at this site and at the similar sites, vapor emissions resulting from normal field operations, if they were to occur, are not anticipated to exceed the response levels. If the response levels are exceeded at any monitoring location, implementation of appropriate mitigative measures to suppress vapor emissions will be initiated. Appropriate mitigative measures may include ceasing operations until the exact cause of the emissions can be identified and corrected. Vapor control actions include vapor suppression foams, covering exposed soil piles with plastic sheeting, and/or spraying exposed soil piles with water.

Site activities may impact the local air quality through generation of fugitive dust. Fugitive dust emission control actions include minimizing the area of the Site which is subject to disturbance at any one time and limiting the movement of trucks and other equipment over exposed soil surfaces. During dry weather conditions, spraying water on unpaved areas subject to construction vehicle traffic may be used to help control dust. Attempts will be made to keep large paved areas clear of loose dirt which can be re-entrained into the air. The use of stone tracking pads at access points to the Site may also lessen the tracking of soil onto adjacent roadways.

6.23 SITE SECURITY, SITE CONTROL AND SITE EVACUATION PROCEDURES

In emergency situations, the following actions will be enforced:

- All personnel will report to a prescribed designated area as soon as possible. If access to that area is prohibited due to the nature of the emergency, all personnel will meet at a location upwind from the emergency. These areas will be designated by the SSO at the Daily Site Safety Briefing.
- Security and control of the work area will be the responsibility of the SSO. The SSO will coordinate the emergency situation with appropriate personnel and emergency responders (e.g., fire department, ambulance squad, haz-mat responders).

- If present, site security personnel will not permit any additional personnel (with the exception of emergency response personnel) from entering the work area.
- The SSO will communicate with supervisors during emergencies. Supervisors will then relay information to their employees. Two-way portable radios, if available, or audio and/or visual signals will be used to communicate the nature of the emergency and response actions.

6.24 URS SUBCONTRACTORS

Subcontractors retained by URS and its subsidiary companies must follow the requirements of URS SMS 046, Subcontractor Health and Safety Requirements. The provision of URS SMS 046 are applicable to the operations of URS-retained subcontractors and sub-subcontractors of any tier. URS SMS 046 does not apply to “third party” contractor operations where there is no subcontract relationship between the contractor and URS. Health and safety issues regarding “third party” contractor operations are governed by project-specific contracts and are not covered by URS SMS 046.

URS SMS 046 provides requirements for the pre-evaluation of “high risk” subcontractor safety programs. It also provides requirements on contractual risk management, subcontractor safety performance, and responsibilities of the URS Project Manager.

Completed Subcontractor Safety Evaluation forms (Attachment 46-1 to URS SMS 046) must be kept in the project files; in addition, a copy of this form must be submitted to the HSM prior to that subcontractor being contracted to perform work at the Site. If the subcontractor meets the requirements of URS SMS 046 as defined in the Subcontractor Evaluation Criteria (Attachment 46-2 of URS SMS 046), no additional verification is required. If a potential subcontractor does not meet URS SMS 046 safety requirements, a Subcontractor Variance Form (Attachment 46-3 of URS SMS 046) must be completed and submitted to the RHSM for review by the URS Project Manager. Once the variance has been approved by the RHSM, a copy of the approved form must be placed in the project files and provided to the HSM. This variance must be obtained prior to the subcontractor being retained by URS. Variances are site-specific; they are applicable to only a single project and the scope of work defined in the variance when it is approved (i.e., variances obtained for a subcontractor on a project may not be applied to a different project for that subcontractor even if the scope of work is similar or, even, identical).

To facilitate review of safety programs of potential subcontractors, a list of contractors which have previously submitted safety information is provided on the HSE website on The Source. To access this list, click on “Related Links”; the list may be found under “Subcontractor Safety PreQualification.”

6.25 BEHAVIOR BASED SAFETY

URS has implemented a behavior based safety program to enhance the performance of our Corporate HSE Programs. Behavior based safety is a process that provides a higher level of safety excellence by promoting proactive responses, building ownership and developing opportunities which relate to employee safety. A primary concept of behavior based safety is

that most accidents are due to unsafe behavior, and that behavioral changes may be made that significantly reduce accident risk. URS SMS 072, Behavior Based Safety, provided in Appendix B, provides additional information about this program. As stated in URS SMS 072, it is the responsibility of the URS Project Manager to implement the behavior based safety procedures. The URS Project Manager must mandate the implementation of safety observations to field personnel using the Behavior Based Safety Checklist (Attachment 72-1 of URS SMS 072); copies of completed checklists must be kept in the project files. If any “unsafe” observations are indicated on the checklist, a copy of that checklist must be provided to the HSM within two working days of the date of the observation.

7.1 INTRODUCTION

Site-specific health and safety requirements generally consist of protective equipment and decontamination procedures chosen according to the activity being performed and the potential contaminants in the area of the activity. Table 2 identifies activity-specific initial levels of protection and action levels for the investigatory activities planned at the Site.

The PPE specified in this HASP will be available to all field personnel. The following requirements will be followed in accordance with OSHA regulations:

- facial hair which interferes with the proper fit of air-purifying respirators must not be worn;
- wearers of contact lenses must also wear appropriate eye and face devices in a hazardous environment; and,
- eyeglasses which interfere with the proper fit of full-face respirators must not be worn.

7.2 PERSONAL PROTECTIVE EQUIPMENT

Selection of the PPE specified for the Project is based on a review of the identified or suspected hazards, routes of potential exposure to workers (i.e., inhalation, skin absorption, ingestion, and skin or eye contact) and the performance of the PPE in providing a barrier to these hazards. In addition, the choice of PPE has been reviewed to match the work requirements and task-specific conditions to provide adequate protection without causing unnecessary physical impairment to the worker.

7.2.1 Level D Personal Protective Equipment

Level D PPE may be used when the atmosphere contains no known hazard and when work functions preclude splashes, immersion or the potential for unexpected inhalation of or contact with hazardous levels of any chemical substance. Level D PPE consists of:

- cloth coveralls/work clothes;
- chemical resistant, steel-toed work boots; or steel-toed rubber boots; or rubber overboots or disposable boot covers over steel-toed work boots;
- American National Standards Institute (ANSI) Z87.1 – 2003 High Impact – compliant safety glasses (equipped with polycarbonate side shields) or goggles (hereinafter, safety glasses or goggles) when conducting, or in the vicinity of, any activity covered by this HASP;
- ANSI Z89.1 – 2003, Type I, Class E – compliant hard hat (hereinafter, hard hat) when physical hazard to head exists;
- Nitrile[®]-butadine rubber or polyvinyl chloride (PVC) gloves (when handling potentially contaminated soil, water or other material); well-fitting work gloves for clean tasks; and,

- ANSI S3.19 – 1974 – compliant hearing protection (i.e., ear plugs or ear muffs) of an appropriate Noise Reduction Rating (hereinafter, hearing protection) if noise levels exceed 85 dBA (eight hour average) or 100 dB peak (impact/impulse).

7.2.2 Modified Level D Personal Protective Equipment

Modified Level D PPE may be used in areas that normally can qualify for Level D PPE, but where a potential hazard requiring a minor upgrade in the level of protection may exist. Modified Level D PPE consists of:

- uncoated, polyethylene-coated or Saranex[®]-impregnated Tyvek[®] coveralls or equivalent;
- chemical-resistant, steel-toed rubber boots; or steel-toed rubber boots; or rubber overboots or disposable boot covers over steel-toed work boots;
- Nitrile[®]-butadiene rubber or PVC gloves; well-fitting work gloves for clean tasks;
- hard hat (when physical hazard to head exists);
- safety glasses or goggles (when conducting, or in the vicinity of, any activity covered by this HASP); and,
- hearing protection (i.e., ear plugs or ear muffs) if noise levels exceed 85 dBA (eight hour average) or 100 dB peak (impact/impulse).

7.2.3 Level C Personal Protective Equipment

Level C PPE consists of:

- polyethylene-coated or Saranex[®]-impregnated Tyvek[®] coveralls or equivalent;
- chemical-resistant, steel-toed rubber boots; or steel-toed rubber boots; or rubber overboots or disposable boot covers over steel-toed work boots;
- Nitrile[®]-butadiene rubber or PVC inner gloves;
- chemical-resistant Nitrile[®] outer gloves;
- half-face respirator with appropriate organic vapor/acid gas and/or particulate cartridges;⁽¹⁾
- hard hat (when physical hazard to head exists); and,
- hearing protection (i.e., ear plugs or ear muffs) if noise levels exceed 85 dBA (8-hour average) or 100 dB peak (impact/impulse).

⁽¹⁾ Cartridge selection (i.e., organic vapor/acid gas, particulate or organic vapor/acid gas/particulate combination filter cartridge) to be based on the results of air quality monitoring.

7.2.4 Limitations of Protective Clothing

The PPE ensembles selected for this Project are anticipated to provide protection against the types and concentrations of hazardous materials that may be encountered during field operations. However, no protective garment, glove or boot is resistant to all chemicals at any concentration; in fact, chemicals may continue to permeate or degrade a garment even after the source of the contamination is removed.

To obtain optimal usage from PPE, the following procedures are to be followed by all URS personnel:

- When using Tyvek[®] or equivalent coveralls, don a clean new garment after each rest break or at the beginning of each shift or when they become damaged or torn.
- Inspect all clothing, gloves and boots, both prior to and during use, for:
 - imperfect seams;
 - non-uniform coatings;
 - tears; and,
 - poorly functioning closures.
- Inspect reusable garments, boots, and gloves prior to and during use for:
 - visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness; and,
 - cracks or any signs of puncture or abrasion.

Reusable garments exhibiting any of these characteristics must be discarded.

7.2.5 Duration of Work Tasks

The SSO will establish the duration of work tasks in which personnel use PPE ensembles that include chemical protective clothing (including uncoated Tyvek[®] or equivalent coveralls). Variables to be considered include ambient temperature and other weather conditions, the capacity of individual personnel to work in the required level of PPE in heat and cold, and the limitations of specific PPE ensembles. Recommended rest breaks are as follows:

- 15 minutes midway between shift startup and lunch;
- lunch break (30 to 60 minutes); and,
- 15 minutes midway between lunch and shift end.

Rest breaks are to be taken in the support zone or other clean area after personnel have completed the decontamination process, including washing the hands and face with soap and water. Additional rest breaks will be scheduled according to heat stress monitoring protocols as described in SMS 18, Heat Stress.

7.3 RESPIRATORY PROTECTION PLAN

Air-purifying respirators provide respiratory protection to the wearer in atmospheres where limited concentrations of known contaminants are present. Cartridges were selected based on a knowledge of the concentration and type of contaminant to be encountered. At a minimum, cartridges must be replaced after each 8-hr work period or at any time when breakthrough is detected while in use.

The following checks must be performed before donning an air-purifying respirator:

- Exhalation valve - pull off plastic cover and check valve for debris or for tears in the valve which could cause leakage.
- Inhalation valves - screw off both cartridges and visually inspect valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
- Make sure a protective lens cover is attached to the lens.
- Make sure you have the right cartridge.
- Make sure that the face piece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.
- Make sure the speaking diaphragm retainer ring is hand tight.

To don respirator, fit facepiece on nosebridge making sure that you are able to breathe through the nose. Then swing bottom of facepiece into contact with the chin. When using elastic or rubber headbands, position headbands with longest straps above the ears and over the crown of the head and headbands with shortest straps below the ears around nape of the neck. When using cradle headband, position cradle headband around the crown of the head; position bottom headbands below the ears and around the nape of the neck. Then, adjust the straps for a comfortable fit by moving adjustment slides to lengthen or shorten straps. Adjust the straps just snug enough so that no air leaks around the facepiece. It is not necessary to pull the straps so tight that the respirator “digs” into the face.

THE RESPIRATOR MUST BE SUBJECTED TO THE FOLLOWING FIT CHECK BEFORE EACH USE.

Test respirator for leakage using a positive pressure method. Lightly place palm over exhalation valve cover. Exhale gently. A slight positive pressure should build up inside the respirator. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other than facial seal leakage is detected, the condition must be investigated and corrected before another test is made. A negative pressure test should also be performed. Lightly place palms over cartridges or filter holders. Inhale gently and the facepiece should collapse against the face. The respirator must pass the tightness tests before the respirator is used. The respirator will not furnish protection unless all inhaled air is drawn through suitable cartridges or filters.

For specific instructions on air-purifying respirators, consult the manufacturer’s directions.

Respirator Selection

Engineering controls and safe work practices (e.g., elimination of the source of contamination, ventilation equipment, working upwind, limiting exposure time) always must be the primary control for air contaminants. Respirators will be used if engineering or work practice controls are not feasible for controlling airborne exposures below acceptable concentrations and as an interim control measure while engineering or work practice controls are implemented.

Once the need for respirators has been established, the respirators will be selected on the basis of the hazards to which the worker is exposed. Only NIOSH-approved respirators will be issued. Selection criteria established in OSHA Regulation 29 CFR 1910.134 have been used in determining respirator requirements for this Project.

***CAUTION:** Air purifying respirators are not to be used where there is an oxygen deficiency. Only air-supplied respirators with an emergency escape cylinder or self-contained breathing apparatus will be worn when an oxygen deficiency exists.*

***CAUTION:** No air purifying protection is available for certain gases. Be sure that the filter cartridge and type of respirator are appropriate for the type and concentration of gas in the environment in which you will be working.*

***CAUTION:** A respirator does not protect against excessive heat or against a hazardous substance that can attack the body through the skin.*

Airborne contaminants have been evaluated based on the suspected contaminants of concern. The concentration of the airborne chemical hazard will be evaluated using direct-reading instruments to determine what type of respirator will be used.

Fit Testing

A person wearing a respirator must be clean-shaven in the area of the face-piece seal. Long hair, sideburns and skullcaps that extend under the seal are not allowed. Glasses with temple pieces extending under the seal are not allowed for full-face respirators. Persons with facial conditions that prevent a proper seal are not allowed to wear a respirator until the condition is corrected. Facial conditions that may cause a seal problem include missing dentures, scars, severe acne, etc. Contact lenses may be worn with respiratory protection.

No individual will enter an area where the use of respiratory protective equipment is required unless the person has been fit tested within the last year. Fit testing will be performed in accordance with accepted fit test procedures defined in SMS 042, Respiratory Protection, a copy of which is to be maintained at the Site.

Respirator Use Instructions

Only those employees who have been properly trained and qualified on the specific type of respirator to be worn may use respirators. No individual will enter an area where the use of respiratory protective equipment is required unless the person has been trained.

All employees whose job assignments require the use of respirators are trained in accordance with OSHA Regulation 29 CFR 1910.134 during initial 40-hour training and annual 8-hour refresher training for hazardous waste operations.

Hands-on training in inspecting and donning a respirator, including user seal checks, is also provided at the time of fit testing. Retraining is performed annually on each type of respirator worn by the individual. In addition, site-specific respirator training is provided during Daily Safety Briefings conducted by the SSO. Training records are kept in the employee's health and safety file.

A particulate respirator cartridge will be changed out when the wearer has difficulty breathing through the cartridge or, at least, daily. Chemical gas or vapor respirator cartridges will be changed out at least daily.

The fit of a chemical gas or vapor respirator will be rechecked and the cartridges will be changed if the wearer detects chemical odor or feels chemical irritation on the skin, both of which are indicators of leakage or cartridge breakthrough. Where available, an End-of-Service Life Indicator (ESLI) will be used on chemical respirator cartridges. Cartridges will be changed as soon as the ESLI indicates that the cartridge is saturated and no longer effective in absorbing airborne chemicals.

Respirator Inspection

The user will inspect respirators before and after each day's use. The inspection procedure for air-purifying respirators (full-face piece and half-face piece cartridge respirators) is as follows.

Examine the face piece for:

- excessive dirt;
- cracks, tears, holes or distortion from improper storage;
- inflexibility;
- cracked or badly scratched lenses (full-face only);
- incorrectly mounted eyeglass lenses or broken or missing mounting clips (full-face only); and,
- cracked or broken air-purifying element holder, badly worn threads or missing gaskets.

Examine the head straps or head harness for:

- breaks or cracks;
- broken or malfunctioning buckles; and,
- excessively worn serration on the headstraps, which may permit slippage.

Examine the two inhalation valves and the exhalation valve for:

- foreign material (e.g., hairs, particles);
- improper insertion of the valve body in the face piece;
- cracks, tears or chips in the valve body (particularly in the sealing surface); and,
- missing or defective exhalation valve covers.

Examine the air-purifying cartridge for:

- missing or worn cartridge-holder gasket;
- incorrect cartridge/canister for the hazard;
- incorrect cartridge installation, loose connections or cross threading in the holder; and,
- cracks or dents in the outside case or threads of the filter or cartridge/canister.

Cleaning of Respirators

Respirators assigned and worn by one individual must be dismantled and thoroughly cleaned and disinfected after each day's use. Visitors' respirators or respirators assigned to several individuals must be cleaned and disinfected after each use. A disinfectant spray or wipe is approved as a disinfectant between uses during the day but not for cleaning and sanitizing after each day's use. Care must be taken to prevent damage from rough handling during the cleaning procedure. After cleaning, respirators must be reassembled. The procedures for cleaning respirators follow:

- Washing: Disassemble and wash with a mild liquid detergent in warm water (not to exceed 110°F). A stiff bristle (not wire) brush may be used.
- Rinsing: Rinse in clean water (110°F maximum) to remove all traces of detergent. This is important to prevent dermatitis.
- Disinfecting: Thoroughly rinse or immerse in a sanitizer provided by the manufacturer. Alternatively, a weak chlorine bleach solution (1 milliliter of liquid bleach per liter of water) may be used.
- Final Rinsing: Rinse thoroughly in clean water (110°F maximum) to remove all traces of disinfectant. This is important to prevent dermatitis.
- Drying: Drain and dry by hanging by the straps from racks (take care to prevent damage) or by towel drying with clean, soft cloths or paper towels.

Maintenance of Respirators

Routine respirator maintenance, such as replacing missing valves, gaskets and nose cups, must only be performed by trained respirator users or a respirator manufacturer's representative. Only approved replacement parts must be used. The substitution of parts from a different brand or type of respirator is generally not possible, invalidates the technical

approval of the respirator, and is not permitted. Any respirator suspected of being defective must be removed from service and replaced.

Storage of Respirators

When not in use, respirators must be stored to protect them from dust, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, and physical damage. Respirators must be stored in sealable (e.g., Ziplock[®] or twist-tie) reusable plastic bags between shifts.

The respirator storage environment must be clean, dry and away from direct sunlight. Onsite cabinets or cases are suggested. Storing bagged respirators in vehicles is discouraged because of the potential for damage from other materials or equipment.

The SSO will oversee the respirator maintenance program, including documentation of maintenance and repair.

The purpose of this section of the HASP is to address how field personnel will respond to on-site emergencies. The types of potential emergencies which are addressed by this HASP include:

- fires;
- chemical exposures to personnel; and,
- physical injuries to personnel.

After any emergency, the SSO will document in a detailed emergency summary report the nature of the emergency, causes for occurrence, chemical exposures or physical injuries to personnel, physical damage and emergency responses taken. This report will be in addition to the Injury/Illness/Incident Report. Copies of this report must be submitted to the URS Project Manager and the HSM within 24 hours of the emergency. The HSM will review this report as soon as possible and issue a critique of the response to the emergency within 48 hours of receiving the report; this critique will be distributed to all personnel receiving copies of the Injury/Illness/Incident Report. If this critique indicates that additional emergency response equipment, training, personnel or response procedures are required at the Site, these actions will be implemented as soon as possible.

8.1 EMERGENCY RECOGNITION AND PREVENTION

8.1.1 Fires

Fires are possible whenever flammable gases or vapors are present in proper concentrations and an ignition source is present. Construction equipment itself provides an ignition source. To prevent fires, a CGI as specified in Section 6 will be used at the discretion of the SSO to detect flammable concentrations of gases or vapors. Ignition sources (including construction equipment) will be turned off and the area evacuated if vapors or gases reach 10 percent of the LEL. Work will not resume until the SSO observes CGI flammable gas concentrations continuously below 10 percent of the LEL for 15 minutes or more.

8.1.2 Chemical Exposures

Work will be performed in such a manner that exposure to contaminants through skin or eye contact, inhalation or ingestion is minimized. Work practices that will be followed to reduce chemical exposures include:

- PPE, as specified in Section 7, for the appropriate work activities and areas as defined by the SSO, will be used by all field personnel. An addendum to the HASP must be prepared by the HSM and authorized by the URS Project Manager and HSM in order to modify the PPE requirements.
- Keep hands away from face during work activities.
- Minimize all skin and eye contact with contaminants.

Early recognition of chemical exposure symptoms is essential to the prevention of serious chemical exposure incidents. Symptoms of exposure to the type of compounds potentially present at the Site include the following: fatigue; weakness; eye, nose or throat irritation; headache; dizziness; nausea; vomiting; malaise; tremors; aggressive confusion; cyanosis (i.e., blue color to skin); anemia and muscle spasms.

If a person experiences any of these symptoms or others, or recognizes any of the symptoms in a fellow worker, the person experiencing the symptoms will stop work and report his/her symptoms to the SSO. If the symptoms persist or appear to be damaging in any way, the SSO will make arrangements to have the individual taken to a hospital for medical treatment as soon as possible. If symptoms are serious, work activities in the area where the person was exposed will be discontinued until more is known about the incident.

8.1.3 Physical Injuries

Personnel should constantly look for potential safety hazards such as holes or ditches; precariously positioned objects such as drums or equipment that may fall; sharp objects such as nails, metal shards and broken glass; protruding objects at eye or head level; slippery surfaces; steep grades; uneven terrain or unstable surfaces such as walls which may cave in or flooring that may give way. Personnel will inform the SSO of any potential hazards identified so that corrective mitigative action can be taken.

8.2 EMERGENCY ALERTING PROCEDURES

In the event of an emergency, personnel will use the following hand signals where voice communications are not feasible:

Signal	Definition
Hands clutching throat	“Out of air/can’t breathe”
Hands on top of head	“Need assistance”
Thumbs up	“OK/I’m all right/I understand”
Thumbs down	“No/negative”
Arms waving upright	“Send back support”
Grip partner’s wrist	“Exit area immediately”

The SSO will use a portable radio or direct contact to alert the appropriate work groups when and if an emergency occurs. The SSO and any isolated work group will carry two-way radios if reasonable contact cannot be maintained. If radios fail, blast(s) from an alarm horn will be used to signal workers. The following signals will be used:

- one long blastevacuate area
- two short blastslocalized problem (no danger to workers)
- two long blastsall clear
- three short blastsmedical emergency

8.3 EMERGENCY TELEPHONE

If it is determined during the Safety Orientation Meeting that no individuals in a distinct work area possess a cell phone, the closest accessible telephone during working hours will be identified by the SSO prior to commencing field activities in that work area. When working in remote areas, a cell phone must be available. Emergency telephone numbers will be posted in URS field vehicle(s) and any field office trailer and will be available from the SSO present at all site activities.

8.4 EMERGENCY MEDICAL RESPONSE

The SSO will have the primary role in responding to all emergencies in the work area. All personnel present in the work area will contact the SSO in case of emergency. The SSO or designee must be present at the Site during all work activities in a CRZ or EZ. If reasonable contact cannot be maintained, the SSO will carry a two-way portable radio and each isolated work activity group will also have a two-way portable radio. If any emergency such as a fire, chemical exposure or physical injury occurs, the SSO will be immediately contacted. The SSO, or designee performing in this capacity, must have First Aid and blood borne pathogens training, and be familiar with universal precautions. In cases of emergency response, all field personnel will take direction from the SSO. If the SSO or designee is not present or has been injured, the Site Manager will respond to emergencies.

To obtain emergency medical treatment and ambulance service at the Site, dial 911 (for cellular phones, be prepared to give the operator your name and location address). Other emergency telephone numbers are included in Table 3. This table will be maintained by the SSO and kept readily available in URS field vehicle(s) and any field office trailer. It will be revised and updated to reflect any and all new emergency information. The revised table will be approved by the URS Project Manager before distribution.

The SSO will have the primary role in responding to all emergencies in the work area. In the event of a serious personal injury requiring off-site medical attention, the injured person will first be moved outside the work zone where an attempt will be made to go through the decontamination procedures including removal of protective clothing. If a head, neck, back or spinal injury is suspected, the injured person will not be moved and an ambulance will be summoned.

8.4.1 Emergency Decontamination Procedures

Decontamination of an injured or exposed worker will be performed only if decontamination does not interfere with essential medical treatment.

If decontamination can be performed: wash, rinse and/or cut off protective clothing and equipment and bag immediately.

If decontamination cannot be performed:

- wrap the victim in blankets or plastic sheeting to reduce contamination of other personnel;

- alert emergency and medical personnel to potential contamination; and,
- Arrange to have the SSO or other personnel familiar with the incident and contaminants at the Site accompany the victim to the hospital.

8.4.2 Physical Injury

In the event of physical injury, the following steps will be taken:

- evaluate the extent of injuries;
- summon emergency help as deemed necessary by the SSO or the SSO's designee;
- modify decontamination procedures as appropriate considering the actual levels of contaminants on the person, if any, and type or severity of injuries; and,
- apply First Aid.

In case of a severe injury requiring immediate attention (e.g., a neck or back injury, victim is unconscious or a severe burn or laceration), dial 911 for emergency medical services. Other emergency telephone numbers are provided in Table 3.

If the injury is clearly minor (e.g., a minor burn or cut), after decontamination, the injured individual may be driven to a First Aid Medical Services Facility. The First Aid Medical Services Facility selected for this project is Park Slope Emergency Physician Services (see Table 3 for directions from the Site to the First Aid Medical Services Facility).

Medical attention must be sought regardless of how minor the injuries appear to be.

8.4.3 Injury Due to Cold Exposure

First aid for frostbite consists of the following procedures:

- decontaminate victim;
- bring victim indoors and quickly rewarm the affected areas in water between 102° and 105°F;
- give victim a warm drink - not coffee, tea or alcohol;
- do not permit the victim to smoke;
- keep the frozen parts in warm water or covered with warm clothes for 30 minutes, even though the tissue will be very painful as it thaws;
- evaluate the injured areas and cover with sterile, soft, dry material;
- keep the victim warm and get immediate medical care;
- do not rub the frostbitten part;
- do not allow blisters to be broken;
- do not use ice, snow, gasoline or anything cold on frostbite;

- do not use heat lamps or hot water bottles to rewarm the part; and,
- do not place the affected part near a hot stove.

First Aid for exposure to cold (hypothermia) consists of the following procedures:

- decontaminate victim;
- bring victim into a warm area as quickly as possible;
- remove wet or cold garments;
- dry the person thoroughly;
- provide warm, dry clothing or covering;
- provide rapid but gentle rewarming;
- give victim a warm drink - not coffee, tea or alcohol; and,
- keep the victim warm and get immediate medical care.

8.4.4 Injury Due to Chemical Exposure

If it is suspected that a person has suffered from chemical exposure, the following procedures shall be undertaken:

Skin Contact: Flush with water. Remove clothing, if necessary. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide appropriate medical attention.

Inhalation: Move person away from area; decontaminate and transport person to the hospital for medical attention.

Ingestion: Decontaminate and transport person to the hospital for medical attention.

Eye Contact: Irrigate with water for at least 15 minutes. Decontaminate and transport person to the hospital for medical attention.

8.4.5 Emergency Medical Services for Severe Injuries

Emergency telephone numbers are listed in Table 3. If emergency medical treatment is required, the following procedures will be taken:

- Call 911 (for cellular phones, be prepared to give the operator your name and location address) to request an ambulance.
- Contact the URS Occupational Nurse (Jeanette Schrimsher).

8.4.6 First Aid Medical Services Facility for Minor Injuries

If the injury is clearly minor (e.g., a minor burn or cut) contact the URS Occupational Nurse (Jeanette Schrimsher). After decontamination, the injured individual may be driven to the First Aid Medical Services Facility. **If there is any question of the severity of an injury,**

call for emergency medical services by dialing 911 (see Section 8.5.5, Contacting Emergency Services for Severe Injuries, immediately above, for additional information).

The First Aid Medical Services Facility selected for this project is as follows:

MedRite Urgent Care
919 2nd Avenue, New York, NY 10017
(212) 935-3333

Directions to MedRite Urgent Care from the Site site are presented in Table 3.

9.1 PURPOSE AND APPLICABILITY

This Discharge Prevention and Cleanup Plan (the “Plan”) provides procedures relating to discharge prevention of hazardous substances onto the lands and into the waters of the State of New York during field activities associated with this project and, if necessary, cleanup of such discharge. By definition a discharge is any intentional or unintentional action or omission resulting in the releasing, spilling, pumping, pouring, emitting, emptying or dumping of a hazardous substance onto the lands of the State and/or into its waters. A hazardous substance is defined as any substance designated in 40 CFR Part 302 (Designation, Reportable Quantities and Notification Requirements for Hazardous Substances Under the Comprehensive Environmental Response, Compensation and Liability Act of 1980).

In addition, the requirements of NYCDEP’s Environmental, Health & Safety Policies and Procedures, Volume 2, entitled “Spill Prevention, Environmental Release Reporting & Investigation” (hereinafter, the “NYCDEP Spill Procedures”) must be strictly adhered to at all times. Section 7, Bureau of Wastewater Treatment (BWT)-Protocol for Reporting Spills/Releases, of the NYCDEP Spill Procedures, presents BWT-specific procedures for reporting spills. The “All Other Sites (Non-BWS Sites)” section of Part B of the NYCDEP BEDC Emergency and Spill/Release Incident Reporting Protocols presents additional information about reporting spills. A copy of the NYCDEP Spill Procedures is provided in Attachment 1.

The NYCDEP Spill Procedures apply to all releases of petroleum, hazardous substances, wastewater/sewage or other pollutants on NYCDEP property or a field work locations, whether or not caused by NYCDEP activities or those of its contractors. The NYCDEP Spill Procedures do not apply to transportation accidents or other releases caused by third parties unrelated to NYCDEP water or wastewater operations in New York City or its watersheds although NYCDEP may respond to these incidents as part of its water supply protection New York City Hazmat technical support roles.

9.2 RESPONSIBILITIES

The URS Project Manager is responsible for ensuring that the Plan is implemented. The URS Project Manager will provide guidance to the Site Manager relating to compliance with the provisions of this Plan.

9.3 DISCHARGE CONTAINMENT AND CLEANUP

Procedures for discharge containment should be enacted immediately following a discharge event. Absorbent sheets and rolls, and booms can be used to contain the discharged hazardous substance on both land and water. Storm sewers or other access points to the subsurface should be protected with barrier materials and/or absorbent materials as soon as possible.

Listed below are a number of cleanup procedures which can be employed. The methods presented below should not be considered as “all inclusive.” Absorbent materials will be stored in a designated area at the Site. In selecting the appropriate method, keep in mind the

health and safety of personnel. In addition, consider the potential of a discharge emitting vapors or presenting a flammability hazard.

For discharges on a hard surface, mop with a commercial mop, apply absorbent material to the residue, and sweep clean. Alternatively, vacuum with an explosion proof wet vacuum. Place the residue in a Department of Transportation (DOT)-approved storage container.

For pooled discharges on a hard surface, pump the discharge into a DOT-approved container with an explosion proof centrifugal or vacuum pump. Alternatively, for large discharges, contact an environmental services company to remediate the discharge.

For non-pooled discharges on gravel or soil, apply absorbent and/or absorbent sheets to absorb as much of the product from the gravel or dirt as possible. Apply additional absorbent and/or absorbent sheets as required to recover the remaining contaminated material. Place the recovered product and saturated absorbent material in a DOT-approved container.

All residue recovered from the discharge cleanup will be disposed of in accordance with applicable Federal, State and local rules and regulations.

For quick response, as appropriate, the following discharge containment and cleanup materials will be maintained at a readily accessible location at the Site:

- squeegees;
- brooms;
- shovels;
- DOT-approved containers;
- a small explosion proof pump or wet vacuum unit (if deemed necessary by SSO);
- one or more of the following absorbents:
 - inorganic perlite (granular),
 - inorganic vermiculite (granular),
 - straw,
 - synthetic organic polypropylene sheets or rolls of absorbent material, and/or
 - loose sand;
- commercial mops; and,
- commercial absorbent and/or absorbent sheets.

9.4 DISCHARGE NOTIFICATION REQUIREMENTS

The responsibility for informing the required agencies in the event of a hazardous substance discharge is assigned to the URS Task Manager. All notifications must be made in strict accordance with the requirements of the NYCDEP Spill Procedures. Additionally, the URS Task Manager is responsible for initiating control and countermeasures relating to the discharge.

Any notification performed by a person responsible for a discharge must include the following information as a minimum:

- the name, title, affiliation, address and telephone number of the person reporting the discharge;
- the location of the discharge, with as much specificity as NYCDEP requested, and in any event with sufficient specificity to enable the NYCDEP to direct its agents and employees and any other person to the discharge site, including:
 - the name of the Site, the street address, the municipality and the county; and,
 - for discharges into water, the name of the water body, location of the discharge with reference to a fixed point or points, and a description of the area which the discharge may reach.
- the common name of the hazardous substance(s) discharged;
- an estimate of the quantity of each hazardous substance discharged, including best estimates if the quantities are unknown;
- the date and time at which the discharge began, the date and time at which the discharge was discovered, and, if the discharge has ended, the date and time at which it ended;
- the actions such person proposes to take to contain, clean up and remove the hazardous substance(s) discharged; and,
 - the name and address of any person responsible for the discharge.

10.1 GENERAL

Records shall be kept documenting the site safety program. Logs and records will be kept for training, safety meetings, injury/exposure and air monitoring data. A daily health and safety log will be maintained by the SSO. This log shall include a description of the field work being conducted, any changes in the operations, names of all personnel working at the Site, types of air monitoring equipment being used and how calibrated, air monitoring results, level of PPE being worn, accidents and injuries, and a description of any unusual occurrences or physical complaints.

10.2 PERSONNEL RECORDS

Records shall be kept for each on-site individual. Records include a medical clearance statement from a qualified physician, and fit test and training documentation. When site safety meetings are conducted, an attendance sheet, including topics discussed, must be kept.

The following forms must be completed, as appropriate, by the SSO:

- Equipment Calibration Log;
- Project Safety Log;
- Compliance Agreement Form;
- URS Injury/Illness/Incident Report;
- Safety Orientation Meeting/Daily Site Briefings Form; and,
- Job Safety Analysis Forms

The SSO will be responsible for completing the Equipment Calibration Log, the Project Safety Log, the URS Injury/Illness/Incident Report and the Site Safety Briefing Form. The SSO will also ensure that all URS and Contractor personnel working on the Site complete the Compliance Agreement Form, review the Job Safety Analysis Forms and sign the Site Safety Briefing Form. The URS Project Manager will be responsible for completing any accident or investigation information required by the Client. All completed forms will be provided to the URS Project Manager for placement in the project files.

Copies of these forms (with the exception of the URS Injury/Illness/Incident form which is contained in URS SMS 049) are provided on the following pages.

EQUIPMENT CALIBRATION LOG

Project Name: _____

Project No. _____

DATE	TIME	INITIALS	INSTRUMENT	CALIBRATION SOLUTION OR GAS CONCENTRATION	ADJUSTMENTS REQUIRED AND COMMENTS

Project _____

PROJECT SAFETY LOG

Date: _____ Logged by: _____

Weather: _____

Field Tasks: _____

URS Personnel (or contractors) working on site (name and affiliation):

URS Personnel (or contractors) working in exclusion zone:

Visitors to Site:

Air Quality Monitoring Measurements:

Time	Instrument Parameter	Concentration	Locations
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Background:

Exclusion Zone:

Level of PPE: _____

Comments on other safety-related matters:

(including infractions, accidents, injuries, unusual occurrences, physical complaints)

**URS CORPORATION HEALTH AND SAFETY PLAN
COMPLIANCE AGREEMENT FORM**

PROJECT: Remedial Activities
156 Tillary Street Brooklyn, NY 11211

CLIENT:

URS PROJECT NO.: 11140247

I, _____, have received a copy of the Health and Safety Plan (HASP) dated October 2014 for the above-referenced project to review. I have been given an opportunity to read the HASP and have my questions, if any, answered. I understand the HASP and agree to comply with all its provisions. I understand that I can be prohibited from working on the Project for violating any of the safety requirements specified in the HASP.

Signed:

Signature

Date

Company

SAFETY ORIENTATION MEETING/DAILY SAFETY BRIEFING FORM

Project Name _____

Project Number _____ Date _____ Time _____

Location _____

Type of Work _____

SAFETY TOPICS PRESENTED

	Yes/No
Names and Responsibilities of Personnel	_____
Personal Protective Equipment	_____
Chemical Hazards	_____
Physical Hazards	_____
Biological Hazards	_____
Required Work Procedures	_____
Personal Protective Equipment	_____
Air Monitoring	_____
Personnel and Equipment Decontamination	_____
Respiratory Protection	_____
Emergency Procedures	_____
Other _____	_____

ATTENDEES

<u>Name (Printed)</u>	<u>Signature</u>
_____	_____
_____	_____
_____	_____
_____	_____

Meeting Conducted by: _____

Site Safety Officer: _____

Initial Job Safety Analysis

JOB LOCATION	URS PERSONNEL ASSIGNED	DATES OF WORK
Remedial Activities 156 Tillary Street Brooklyn, NY	Cary Friedman (FTM) Megan Dascoli John Crespo(SSO) Mira Abdelaziz	October 2014 through October 2015
TASK DESCRIPTION:		
Collection of Soil Samples		
HAZARD DESCRIPTION:		
<p>Physical Hazards Associated with Heavy Equipment – There may be a risk of physical injury (e.g., crushing, pinch points) resulting from contact with heavy equipment.</p> <p>Chemical Hazards – There maybe a risk of chemical exposures resulting from contact with contaminated dusts, liquids, vapors, mists or chemical constituents brought to the Site. Inhalation and dermal contact are generally the primary routes of exposure; ingestion is a secondary route of exposure.</p> <p>Slip-Trip-Fall Hazards – Dangerous conditions may result from muddy, uneven and slippery surfaces and equipment/supplies in the vicinity of the work area.</p> <p>Traffic Hazards – Traffic hazards may occur in work areas, especially when work activities are performed in highly trafficked areas (e.g., parking lots, roadways).</p> <p>Cold Stress Hazards – Work may be performed during winter when ambient weather is expected to be cold and windy.</p> <p>Heat Stress Hazards – Work may be performed during daylight hours in summer when ambient weather is expected to be warm and humid.</p> <p>Hand Tool Hazards – Physical hazards (e.g., cuts, pinch points) associated with the use of hand tools may cause injury.</p> <p>Biological Hazards – Poisonous plants (e.g., poison ivy), insects (e.g., ticks, spiders) and feral animals (e.g., dogs) may be present at the Site.</p> <p>Weather Hazards – Severe storms may develop which include lightning hazards and/or exacerbate other hazards (e.g., slip-trip-fall hazards).</p> <p>Radiant Energy Hazards – Work activities may be conducted outside during periods of strong sunlight; even on cloudy days, exposure to radiant energy may occur.</p> <p>Lifting Hazards – Field operations may require lifting heavy items (e.g., portable generators, sampling equipment and supplies, sample shuttles, boxes of soil samples, core boxes).</p> <p>Hazards to Public – Work activities may be performed in or adjacent to publicly accessible areas.</p>		

HAZARD CONTROLS:

- 1) An Initial Site Safety Orientation Meeting will be conducted by the URS Site Safety Officer (SSO) prior to conducting any fieldwork. Meeting topics will include the Job Safety Analysis, personal protective equipment requirements, safe sampling techniques, general and site-specific health and safety, site hazards, safe work procedures, releases to the environment, decontamination, air quality monitoring and emergency response. Topics discussed at this meeting and all attendees present will be documented by the SSO as described in the site-specific Health and Safety Plan (HASP). Thereafter, Daily Site Safety Briefings, covering the same topics as the Initial Site Safety Orientation Meeting (as necessary), will be conducted and documented by the SSO.
- 2) Check weather conditions before going to the Site. No work will be performed during “severe” weather conditions.
- 3) The SSO will determine whether any employee performing fieldwork has any special medical condition (e.g., allergy to poisonous plants, insects [especially bees]) that may need to be conveyed to emergency response personnel in case of an accident.
- 4) At least one member of each field team will carry a cellular telephone at all times. Individuals having cellular telephones will have ready access to emergency telephone numbers and directions to the First Aid Medical Facility.
- 5) All work activities will be performed in strict accordance with the requirements of the HASP prepared by URS. All aspects of the URS HASP must be understood by all site personnel and strictly adhered to.
- 6) Personnel will be aware of their location relative to heavy equipment and maintain a safe distance from operating equipment at all times.
- 7) While it is difficult to eliminate slip-trip-fall hazards, implementing safe work practices (e.g., good housekeeping), wearing proper footwear and keeping the work area free of obstructions will reduce the risk of injury.
- 8) Fluids will be provided regularly during the work periods in order to maintain adequate body fluid levels for field personnel to reduce heat stress hazards.
- 9) If work is to be performed continuously in the cold when the wind chill factor is at or below 19 degrees Fahrenheit, heated warming shelters (e.g., tents, trailers, vehicle cabs) will be made available nearby.
- 10) Consider erecting barriers (e.g., snow fencing, caution tape) to control public access to work areas.
- 11) Field personnel are encouraged to use insect repellent to reduce biological hazards.
- 12) Field personnel are encouraged to use sunscreen to reduce radiant energy hazards.

PERSONAL PROTECTION EQUIPMENT

Personal Protective Equipment (PPE) – Potential hazards will be reduced by protecting against exposures to contaminants by using appropriate PPE. If site conditions require respiratory protection to be used, work should be stopped and the requirements to upgrade PPE should be evaluated. Hearing protection will be required when noise levels exceed 85 decibels (8-hr time weighted average) or are greater than 100 decibels at any given time. See Personal Protective Equipment Section of the HASP for additional information.

AIR QUALITY MONITORING

Air Quality Monitoring – The type and frequency of air quality monitoring for worker protection will be dependent on the specific operation, location and available data concerning the work activity being performed. Personal monitoring may be conducted to provide real-time measurements of exposure to Site contaminants. See Air Quality Monitoring Section of the HASP for additional information.

EMERGENCY RESPONSE PROCEDURES

Emergency Response Procedures – Emergency telephone numbers are provided in a table in the HASP. The table will be carried by the SSO and at least one member of each work team, and kept readily available in URS field vehicle(s) and all field trailers. The table will be revised and updated, as necessary, to reflect all new emergency information. The SSO will have the primary role in responding to all emergencies at the Site. All personnel present in the work area will contact the SSO in case of an emergency.

If an injury is clearly minor (e.g., a minor burn or cut) contact the Health and Safety Representative and/or the URS Occupational Nurse (Jeanette Schrimsher). The injured individual should be driven to the Occupational Health Clinic. If emergency medical treatment is required, call 911 (for cellular phones, be prepared to give the operator your name and location address) to request an ambulance and then contact the URS Occupational Nurse (Jeanette Schrimsher).

See Emergency Response Procedures Section of the HASP for additional information.

DISCHARGE PREVENTION AND CLEANUP PLAN

Discharge Prevention and Cleanup Plan – Procedures for discharge containment will commence immediately following a discharge event. Absorbent sheets, rolls, booms, etc. will be used to contain discharged substances as soon as possible. Storm sewer or other access points to the subsurface will be protected with barrier materials and/or absorbent materials as soon as possible. See Discharge Prevention and Cleanup Section of the HASP for additional information.

Project Manager

Approval:

Robert Wolff

Name

Signature

URS Project Manager

Title

Date

Health and Safety

Manager Approval:

Name

Signature

URS Health and Safety

Representative

Title

Date

Daily Review of Initial Job Safety Analysis

This Initial Job Safety Analysis must be reviewed daily at the Daily Site Safety Briefing. Modifications, as indicated, to reflect actual field conditions must be documented herein and this form signed by the SSO. Add additional pages of this form as required.

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Initial Job Safety Analysis

JOB LOCATION	URS PERSONNEL ASSIGNED	DATES OF WORK
Remedial Activities 156 Tillary Street Brooklyn, New York	Cary Friedman (FTM) Megan Dascoli John Crespo(SSO) Mira Abdelaziz	October 2014 through October 2015
TASK DESCRIPTION:		
Residuals Management Activities		
HAZARD DESCRIPTION:		
<p>Lifting Hazards – Field operations may require lifting heavy items (e.g., drums of purge water, drill cuttings, waste PPE).</p> <p>Cold Stress Hazards – Work may be performed during winter when ambient weather is expected to be cold and windy.</p> <p>Heat Stress Hazards – Work may be performed during daylight hours in summer when ambient weather is expected to be warm and humid.</p> <p>Slip-Trip-Fall Hazards – Dangerous conditions may result from muddy, uneven and slippery surfaces and equipment/supplies in the vicinity of the work area.</p> <p>Hand Tool Hazards – Physical hazards (e.g., cuts, pinch points) associated with the use of hand tools may cause injury.</p> <p>Chemical Hazards – There maybe a risk of chemical exposures resulting from contact with contaminated dusts, liquids, vapors, mists or chemical constituents brought to the Site. Inhalation and dermal contact are generally the primary routes of exposure; ingestion is a secondary route of exposure.</p> <p>Weather Hazards – Severe storms may develop which include lightning hazards and/or exacerbate other hazards (e.g., slip-trip-fall hazards).</p> <p>Biological Hazards – Poisonous plants (e.g., poison ivy), insects (e.g., ticks, spiders) and feral animals (e.g., dogs) may be present at the Site.</p> <p>Radiant Energy Hazards – Work activities may be conducted outside during periods of strong sunlight; even on cloudy days, exposure to radiant energy may occur.</p>		

HAZARD CONTROLS:

- 1) An Initial Site Safety Orientation Meeting will be conducted by the URS Site Safety Officer (SSO) prior to conducting any fieldwork. Meeting topics will include the Job Safety Analysis, personal protective equipment requirements, working around heavy equipment, general and site-specific health and safety, site hazards, safe work procedures, releases to the environment, decontamination, air quality monitoring and emergency response. Topics discussed at this meeting and all attendees present will be documented by the SSO as described in the site-specific Health and Safety Plan (HASP). Thereafter, Daily Site Safety Briefings, covering the same topics as the Initial Site Safety Orientation Meeting (as necessary), will be conducted and documented by the SSO.
- 2) Check weather conditions before going to the Site. No work will be performed during “severe” weather conditions.
- 3) The SSO will determine whether any employee performing fieldwork has any special medical condition (e.g., allergy to poisonous plants, insects [especially bees]) that may need to be conveyed to emergency response personnel in case of an accident.
- 4) At least one member of each field team will carry a cellular telephone at all times. Individuals having cellular telephones will have ready access to emergency telephone numbers and directions to the First Aid Medical Facility.
- 5) All work activities will be performed in strict accordance with the requirements of the HASP prepared by URS. All aspects of the URS HASP must be understood by all site personnel and strictly adhered to.
- 6) While it is difficult to eliminate slip-trip-fall hazards, implementing safe work practices (e.g., good housekeeping), wearing proper footwear and keeping the work area free of obstructions will reduce the risk of injury.
- 7) Fluids will be provided regularly during the work periods in order to maintain adequate body fluid levels for field personnel to reduce heat stress hazards.
- 8) If work is to be performed continuously in the cold when the wind chill factor is at or below 19 degrees Fahrenheit, heated warming shelters (e.g., tents, trailers, vehicle cabs) will be made available nearby.
- 9) Field personnel are encouraged to use insect repellent to reduce biological hazards.
- 10) Field personnel are encouraged to use sunscreen to reduce radiant energy hazards.

PERSONAL PROTECTION EQUIPMENT

Personal Protective Equipment (PPE) – Potential hazards will be reduced by protecting against exposures to contaminants by using appropriate PPE. If site conditions require respiratory protection to be used, work should be stopped and the requirements to upgrade PPE should be evaluated. Hearing protection will be required when noise levels exceed 85 decibels (8-hr time weighted average) or are greater than 100 decibels at any given time. See Personal Protective Equipment Section of the HASP for additional information.

AIR QUALITY MONITORING

Air Quality Monitoring – The type and frequency of air quality monitoring for worker protection will be dependent on the specific operation, location and available data concerning the work activity being performed. Personal monitoring may be conducted to provide real-time measurements of exposure to Site contaminants. See Air Quality Monitoring Section of the HASP for additional information.

EMERGENCY RESPONSE PROCEDURES

Emergency Response Procedures – Emergency telephone numbers are provided in a table in the HASP. The table will be carried by the SSO and at least one member of each work team, and kept readily available in URS field vehicle(s) and all field trailers. The table will be revised and updated, as necessary, to reflect all new emergency information. The SSO will have the primary role in responding to all emergencies at the Site. All personnel present in the work area will contact the SSO in case of an emergency.

If an injury is clearly minor (e.g., a minor burn or cut) contact the Health and Safety Representative and/or the URS Occupational Nurse (Jeanette Schrimsher). The injured individual should be driven to the Occupational Health Clinic. If emergency medical treatment is required, call 911 (for cellular phones, be prepared to give the operator your name and location address) to request an ambulance and then contact the URS Occupational Nurse (Jeanette Schrimsher).

See Emergency Response Procedures Section of the HASP for additional information.

DISCHARGE PREVENTION AND CLEANUP PLAN

Discharge Prevention and Cleanup Plan – Procedures for discharge containment will commence immediately following a discharge event. Absorbent sheets, rolls, booms, etc. will be used to contain discharged substances as soon as possible. Storm sewer or other access points to the subsurface will be protected with barrier materials and/or absorbent materials as soon as possible. See Discharge Prevention and Cleanup Section of the HASP for additional information.

Project Manager Approval:

Robert Wolff	_____	URS Project Manager	_____
Name	Signature	Title	Date

Health and Safety Manager Approval:

_____	_____	URS Health and Safety Representative	_____
Name	Signature	Title	Date

Daily Review of Initial Job Safety Analysis

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Initial Job Safety Analysis

JOB LOCATION	URS PERSONNEL ASSIGNED	DATES OF WORK
Remedial Activities 156 Tillary Street Brooklyn, New York	Cary Friedman (FTM) Megan Dascoli John Crespo(SSO) Mira Abdelaziz	October 2014 through October 2015
TASK DESCRIPTION:		
Inspection of Interim Remedial Measures (IRMs) conducted by a remedial contractor, including soil “hot spot” excavations and/or post-excavation sampling.		
HAZARD DESCRIPTION:		
<p>Physical Hazards Associated with Heavy Equipment – There may be a risk of physical injury (e.g., crushing, pinch points) resulting from contact with heavy equipment.</p> <p>Excavation Hazards - URS field personnel will be observing excavations and trenching. When performing observations on an excavation or trench greater than 4 feet in depth, URS field personnel must remain at least more than 2 feet from the leading edge of the excavation and must never enter a trench or excavation.</p> <p>Noise Exposure – Work activities may be conducted at locations with high noise levels from site operations (e.g., drilling).</p> <p>Chemical Hazards – There maybe a risk of chemical exposures resulting from contact with contaminated dusts, liquids, vapors, mists or chemical constituents brought to the Site. Inhalation and dermal contact are generally the primary routes of exposure; ingestion is a secondary route of exposure.</p> <p>Slip-Trip-Fall Hazards – Dangerous conditions may result from muddy, uneven and slippery surfaces and equipment/supplies in the vicinity of the work area.</p> <p>Traffic Hazards – Traffic hazards may occur in work areas, especially when work activities are performed in highly trafficked areas (e.g., parking lots, roadways).</p> <p>Cold Stress Hazards – Work may be performed during winter when ambient weather is expected to be cold and windy.</p> <p>Heat Stress Hazards – Work may be performed during daylight hours in summer when ambient weather is expected to be warm and humid.</p> <p>Underground Structures/Obstructions/Utilities – The proximal location of underground structures/obstructions/utilities may pose hazards (e.g., fire, explosion, exposure, electrical, environmental release) when intrusive activities are conducted.</p> <p>Overhead Hazards – Overhead power lines may pose a shock or electrocution hazard if the power line is contacted or arcing occurs. Also, overhead piping carrying chemicals may be present.</p> <p>Hand Tool Hazards – Physical hazards (e.g., cuts, pinch points) associated with the use of hand tools may cause injury.</p> <p>Biological Hazards – Poisonous plants (e.g., poison ivy), insects (e.g., ticks, spiders) and feral animals (e.g., dogs) may be present at the Site.</p> <p>Weather Hazards – Severe storms may develop which include lightning hazards and/or exacerbate other hazards (e.g., slip-trip-fall hazards).</p> <p>Hazards to Public – Work activities may be performed in or adjacent to publicly accessible areas.</p> <p>Radiant Energy Hazards – Work activities may be conducted outside during periods of strong sunlight; even on cloudy days, exposure to radiant energy may occur.</p>		

HAZARD CONTROLS:

- 1) An Initial Site Safety Orientation Meeting will be conducted by the URS Site Safety Officer (SSO) prior to conducting any fieldwork. Meeting topics will include the Job Safety Analysis, personal protective equipment requirements, working around heavy equipment, general and site-specific health and safety, site hazards, safe work procedures, releases to the environment, decontamination, air quality monitoring and emergency response. Topics discussed at this meeting and all attendees present will be documented by the SSO as described in the site-specific Health and Safety Plan (HASP). Thereafter, Daily Site Safety Briefings, covering the same topics as the Initial Site Safety Orientation Meeting (as necessary), will be conducted and documented by the SSO.
- 2) Check weather conditions before going to the Site. No work will be performed during “severe” weather conditions.
- 3) The SSO will determine whether any employee performing fieldwork has any special medical condition (e.g., allergy to poisonous plants, insects [especially bees]) that may need to be conveyed to emergency response personnel in case of an accident.
- 4) At least one member of each field team will carry a cellular telephone at all times. Individuals having cellular telephones will have ready access to emergency telephone numbers and directions to the First Aid Medical Facility.
- 5) All work activities will be performed in strict accordance with the requirements of the HASP prepared by URS. All aspects of the URS HASP must be understood by all site personnel and strictly adhered to.
- 6) Personnel will be aware of their location relative to heavy equipment and maintain a safe distance from operating equipment at all times.
- 7) While it is difficult to eliminate slip-trip-fall hazards, implementing safe work practices (e.g., good housekeeping), wearing proper footwear and keeping the work area free of obstructions will reduce the risk of injury.
- 8) The excavation contractor will call for a utility mark-out (e.g., “Dig Safe” request) of all underground utilities at least 72 hours prior to field activities to identify underground utilities that may enter onto the Site. Documentation of this call must be provided to the URS SSO prior to the start of intrusive work and maintained on-site. URS will also request that a representative of the Client/Site Owner identify and mark-out the location of underground structures (e.g., utilities) at the Site.
- 9) Prior to conducting excavation operations adjacent to overhead power lines, work activities must be coordinated with the appropriate utility. The utility company will be notified and information will be obtained regarding line voltage and minimum separation distance required for work in this area. Operations adjacent to overhead lines will not be conducted unless the lines have been de-energized and positive means (e.g., lockout/tag out) have been taken to prevent lines from being energized.
- 10) Fluids will be provided regularly during the work periods in order to maintain adequate body fluid levels for field personnel to reduce heat stress hazards.
- 11) If work is to be performed continuously in the cold when the wind chill factor is at or below 19 degrees Fahrenheit, heated warming shelters (e.g., tents, trailers, vehicle cabs) will be made available nearby.
- 12) Field personnel are encouraged to use insect repellent to reduce biological hazards.
- 13) Field personnel are encouraged to use sunscreen to reduce radiant energy hazards.

PERSONAL PROTECTION EQUIPMENT
<p>Personal Protective Equipment (PPE) – Potential hazards will be reduced by protecting against exposures to contaminants by using appropriate PPE. If site conditions require respiratory protection to be used, work should be stopped and the requirements to upgrade PPE should be evaluated. Hearing protection will be required when noise levels exceed 85 decibels (8-hr time weighted average) or are greater than 100 decibels at any given time. See Personal Protective Equipment Section of the HASP for additional information.</p>
AIR QUALITY MONITORING
<p>Air Quality Monitoring – The type and frequency of air quality monitoring for worker protection will be dependent on the specific operation, location and available data concerning the work activity being performed. Personal monitoring may be conducted to provide real-time measurements of exposure to Site contaminants. See Air Quality Monitoring Section of the HASP for additional information.</p>
EMERGENCY RESPONSE PROCEDURES
<p>Emergency Response Procedures – Emergency telephone numbers are provided in a table in the HASP. The table will be carried by the SSO and at least one member of each work team, and kept readily available in URS field vehicle(s) and all field trailers. The table will be revised and updated, as necessary, to reflect all new emergency information. The SSO will have the primary role in responding to all emergencies at the Site. All personnel present in the work area will contact the SSO in case of an emergency.</p> <p>If an injury is clearly minor (e.g., a minor burn or cut) contact the Health and Safety Representative and/or the URS Occupational Nurse (Jeanette Schrimsher). The injured individual should be driven to the Occupational Health Clinic. If emergency medical treatment is required, call 911 (for cellular phones, be prepared to give the operator your name and location address) to request an ambulance and then contact the URS Occupational Nurse (Jeanette Schrimsher).</p> <p>See Emergency Response Procedures Section of the HASP for additional information.</p>
DISCHARGE PREVENTION AND CLEANUP PLAN
<p>Discharge Prevention and Cleanup Plan – Procedures for discharge containment will commence immediately following a discharge event. Absorbent sheets, rolls, booms, etc. will be used to contain discharged substances as soon as possible. Storm sewer or other access points to the subsurface will be protected with barrier materials and/or absorbent materials as soon as possible. See Discharge Prevention and Cleanup Section of the HASP for additional information.</p>

Project Manager

Approval:

Robert Wolff

Name

Signature

URS Project Manager

Title

Date

**Health and Safety
Manager Approval:**

Name

Signature

URS Health and Safety
Manager

Title

Date

Daily Review of Initial Job Safety Analysis

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1. American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
2. American Conference of Governmental Industrial Hygienists, Guide to Occupational Exposure Values.
3. National Institute for Occupational Safety and Health, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.
4. National Institute for Occupational Safety and Health, Pocket Guide to Chemical Hazards.
5. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Standard Operating Safety Guides, Publication 9285.1-03.
6. U.S. Occupational Safety and Health Administration, 29 CFR 1910 and 1926.

TABLE 1: HEALTH AND SAFETY RESPONSIBILITIES AND AUTHORITIES

URS REGIONAL HEALTH AND SAFETY MANAGER: Benjamin J. Bertolotti, CIH

Responsibilities

direct the implementation of the health and safety program of the Operating Group and provide recommendations for improvement of the program;
coordinate health and safety activities of the Operating Units in the Operating Group;
determine need for project HASPs;
maintain a high level of understanding regarding health and safety regulations affecting URS;
review and approve HASPs;
monitor implementation of HASPs;
investigate reports of incidents or accidents and report to URS Health and Safety Director;
provide employee health and safety training in the Operating Group;
determine whether an accidental exposure or injury merits a change in the affected individual's work assignments and whether changes in work practices are required;
coordinate Operating Units with regard to health and safety equipment needs; and,
supervise HSMs through a matrix management system, in cooperation with the Operating Unit Managers.

Authority

approve or disapprove HASPs;
direct Operating Unit HSM to prepare project HASPs;
access and review project files;
direct changes in personnel work practices to improve health and safety of employees;
remove individuals from projects, if their conduct jeopardizes their health and safety or that of co-workers; and,
suspend work on any project that jeopardizes the health and safety of personnel involved.

URS PROJECT MANAGER: Robert Wolff

Responsibilities

assure that projects are performed in a manner consistent with the URS health and safety program;
assure that the project HASPs are prepared, approved and properly implemented;
implement HASPs;
assure that adequate funds are allocated to fully implement project health and safety; and,
coordinate with the HSM on health and safety matters.

Authority

- assign HSM-approved SSO to project and, if necessary, assign a suitably qualified replacement;
- suspend field activities if health and safety of personnel are endangered, pending an evaluation by the HSM; and,
suspend an individual from field activities for infractions of the HASP, pending an evaluation by the HSM.

**TABLE 1: HEALTH AND SAFETY RESPONSIBILITIES AND AUTHORITIES
(continued)**

OPERATING UNIT HEALTH AND SAFETY REPRESENTATIVE: ??????????

Responsibilities

administer the health and safety program within the Operating Unit;
maintain a working understanding of key government health and safety regulations and URS health and safety policies;
interface with Project Managers in matters of health and safety;
report to RHSM on health and safety matters;
develop or review, approve or disapprove project HASPs prior to submittal to the RHSM for review;
conduct staff training and orientation on health and safety related activities;
appoint or approve SSOs;
monitor compliance with HASPs and conduct site audits;
assist Project Managers in obtaining required health and safety equipment;
approve personnel to work on hazardous waste management projects with regard to medical examinations, and health and safety training; and,
answer employee questions and concerns regarding health and safety.

Authority

suspend work or otherwise limit exposures to personnel if health and safety risks are unacceptable;
direct personnel to change work practices if existing practices are deemed to be hazardous to health and safety of personnel; and,
remove personnel from projects, if their actions or conditions endanger their health and safety or the health and safety of co-workers.

SITE SAFETY OFFICER: John Crespo

Responsibilities

direct health and safety activities on-site;
report immediately all safety-related incidents or accidents to the HSM and Project Manager;
verify that URS and Contractor personnel working on-site have met current training and medical clearance requirements;
determine that air quality monitoring equipment is used properly by URS personnel in accordance with manufacturer's instructions and that the monitoring results are properly documented and filed;
coordinate with the URS Project Manager and HSM to identify URS personnel on-site for whom special personal protective equipment, exposure monitoring or work restrictions may be required;
conduct safety meetings, as required;
conduct daily site safety inspections;
assist the Project Manager in all aspects of implementing the HASP and addenda, if any; and,
maintain health and safety equipment on-site.

Authority

implement emergency procedures as required;

**TABLE 1: HEALTH AND SAFETY RESPONSIBILITIES AND AUTHORITIES
(continued)**

temporarily suspend field activities if health and safety of personnel are endangered, pending further consideration by the HSM; and,
temporarily suspend an individual from field activities for infractions of the HASP pending further consideration by the HSM.

URS PROJECT PERSONNEL

Responsibilities

take all reasonable precautions to prevent injury to themselves and to their fellow employees;
perform only those tasks that they believe they can do safely and immediately reporting any accidents and/or unsafe conditions to the SSO or URS Project Manager;
implement the procedures set forth in the HASP and reporting any deviations from the procedures described in that HASP to the SSO or URS Project Manager for action;
notify the URS Project Manager and SSO of any special medical conditions (i.e., allergies) and seeing that all onsite URS personnel are aware of such conditions; and,
reviewing the project-specific HASP and addenda, if any, and signing the Safety Plan Compliance Agreement.

Authority

all field personnel following this HASP have “stop work” authority in situations where they believe that injury to themselves, their fellow employees, Contractor or Client personnel or the public, and/or property damage may occur.

TABLE 2: ACTIVITY-SPECIFIC INITIAL LEVELS OF PROTECTION AND ACTION LEVELS

Location	Activity	Initial Level of Protection	Monitoring Requirements	Action Levels
Throughout Site	All work activities authorized in Section 4, Work Activities.	Level D PPE	Organic vapors using PID with 10.5 eV lamp	<p>>5 ppm above background in the breathing zone (sustained reading): Go to Level C PPE (half-face APR)</p> <p>>50 ppm in the breathing zone (sustained reading): Evacuate CRZ and EZ</p> <p>If free product is encountered, go to Modified Level D PPE</p>
			CGI	<p>Flammable gas reading >10 percent LEL: Shut off all ignition sources. Do not resume work until the flammable gas readings are continuously below 10 percent LEL for 15 minutes or more. Notify the URS Project Manager and HSM as soon as possible.</p> <p>Oxygen reading <19.5 percent or >23.5 percent: Suspend work in immediate area and notify the Site Manager, URS Project Manager and HSM as soon as possible. Conduct air monitoring periodically to determine when work may be continued.</p> <p>Carbon monoxide reading >25 ppm: Suspend work in immediate area and notify the Site Manager, URS Project Manager and HSM as soon as possible. Conduct air monitoring periodically to determine when work may be continued.</p>
			Personal Meter for Aerosol and Dust	<p>>2.5 milligrams per cubic meter (mg/m³) (sustained reading): Go to Level C PPE</p> <p>>10 mg/m³ (sustained reading): Evacuate CRZ and EZ</p> <p>*If dust is generated from any ash material encountered in the subsurface, dust suppression methods should be implemented.</p>
			Detector Tube	<p>>0.5 ppm: Go to Level C PPE</p> <p>>5 ppm: Evacuate CRZ and EZ</p>

TABLE 3: EMERGENCY TELEPHONE NUMBERS AND DIRECTIONS TO FIRST AID MEDICAL SERVICES FACILITY

EMERGENCY TELEPHONE NUMBERS

Emergency Services

Medical:	911
Fire:	911
Police:	911

*For cellular phones, be prepared to give the operator your name and location address.

First Aid Medical Services Facility

MedRite Urgent Care

919 2nd Avenue, New York, NY 10017

(212) 935-3333

Hospital Emergency Services

The Brooklyn Hospital

121 Dekalb Avenue #9k

New York, NY 11205

(718) 250-8000

Government

National Response Center	(800) 424-8802
NYC Poison Control Center	(800) 222-1222 (212) 689-9014
Poison Control Center	(800) 962-1253
Owner's Representative: Glen C. Ravn	(917) 797-7464

URS Corporation

Project Manager: Robert Wolff	(212) 896-0185 (office) (347) 306-3914 (cell)
Site Safety Officer: John Crespo	(212) 896-1822 (office) (646) 772-9749 (cell)
Alternate Site Safety Officer: Cary Friedman	(212) 896-0429 (office) (908) 739-0054 (cell)
Health and Safety Representative: Mona Parekh	(973) 883-8615 (office) (848) 203-9257 (cell)
Regional Health and Safety Manager: Benjamin J. Bertolotti	(973) 777-3003 (office) (973) 572-3916 (cell)
Occupational Nurse: Jeanette Schrimsher	(512) 419-6440 (office) (512) 656-0203 (cell)

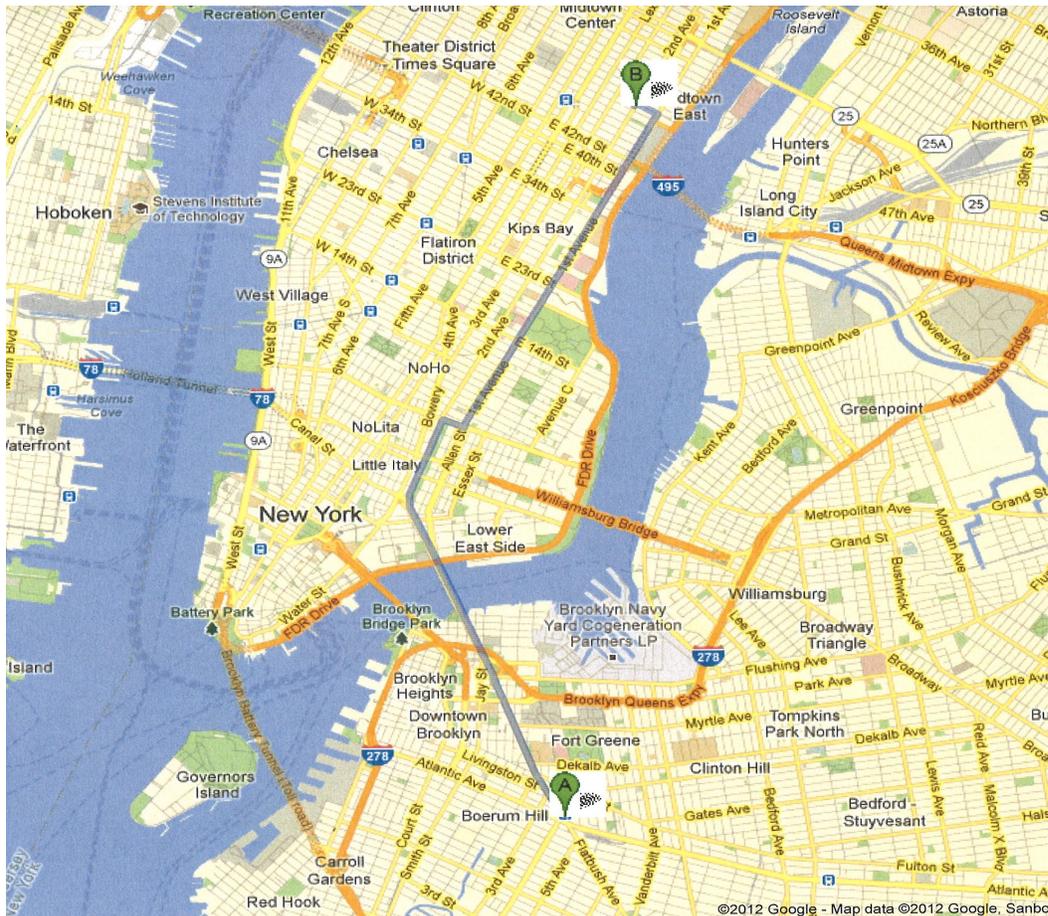
Spill/Discharge Notifications

NYCDEP 24-hr Call Center	(212) 689-1520
NYSDEC Spill Response Hotline	(800) 457-7362
National Response Center	(800) 424-8802
NYCDEP Division of Emergency Response and Technical Assessment	(718) 595-4646
NYSDEC Help-Line	(518) 402-9549

*** Refer to Section 9 and Attachment 1 (NYCDEP Environmental, Health & Safety Policies and Procedures, Volume 2, entitled “Spill Prevention, Environmental Release Reporting & Investigation”), of this Health and Safety Plan for specific information about reporting and documenting spills.**

DIRECTIONS TO FIRST AID MEDICAL SERVICES FACILITY

Directions to MedRite Urgent Care (919 2nd Ave., New York, NY) from the Site



- | | |
|---|---------------------------|
| 1. Head north on Flatbush Ave toward 4th Ave
About 1 min | go 0.3 mi
total 0.3 mi |
| 2. Continue onto Flatbush Avenue Ext
About 3 mins | go 0.6 mi
total 0.9 mi |
| 3. Slight right onto Flatbush Avenue Ext/Manhattan Bridge Upper Roadway
Continue to follow Manhattan Bridge Upper Roadway
About 2 mins | go 1.4 mi
total 2.3 mi |
| 4. Continue onto Chrystie St
About 2 mins | go 0.6 mi
total 2.9 mi |
| 5. Turn right onto E Houston St | go 0.1 mi
total 3.0 mi |
| 6. Turn left onto 1st Avenue
About 6 mins | go 2.0 mi
total 5.0 mi |
| 7. Slight left to stay on 1st Avenue | go 62 ft
total 5.0 mi |
| 8. Slight right onto 1st Ave/United Nations Plaza
Continue to follow United Nations Plaza
About 51 secs | go 0.4 mi
total 5.4 mi |
| 9. Turn left onto E 49th St | go 0.1 mi
total 5.6 mi |
| 10. Take the 1st left onto 2nd Ave
Destination will be on the right | go 118 ft
total 5.6 mi |

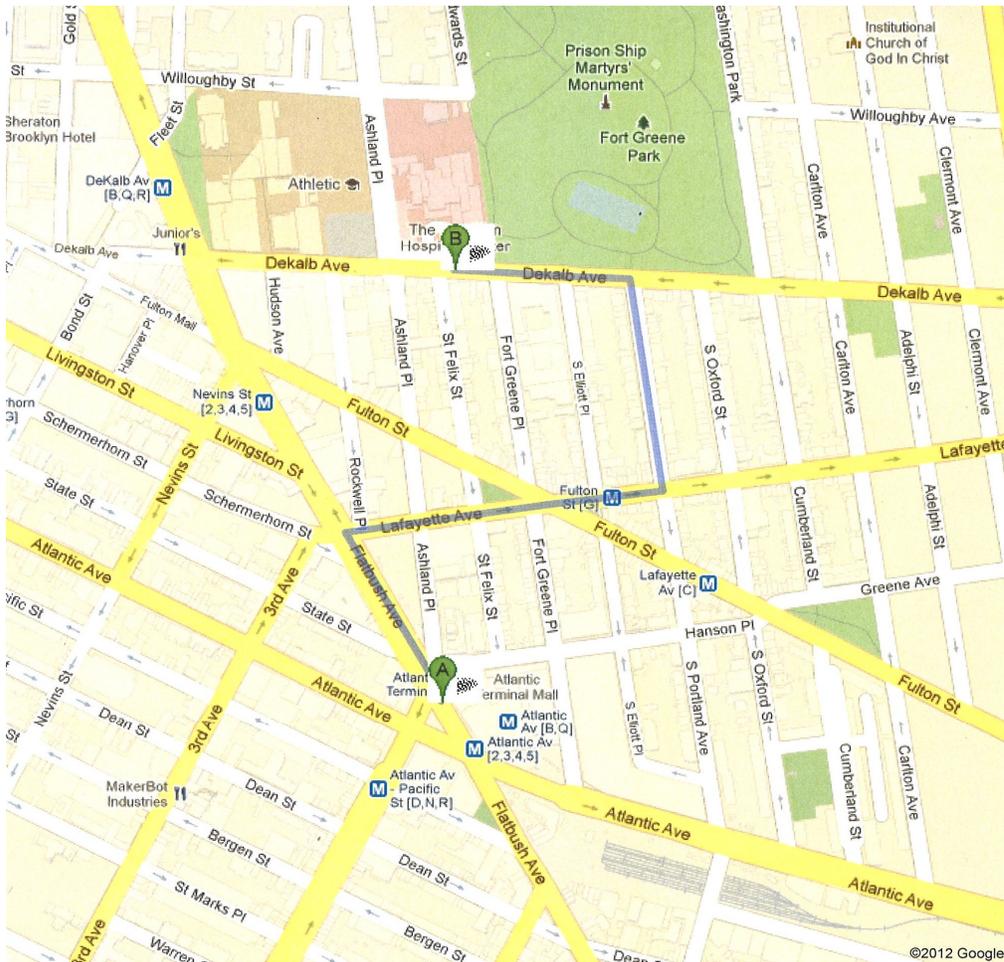
MedRite Urgent Care

919 2nd Avenue, New York, NY 10017

ESTIMATED Driving Distance (Time): 5.6 miles (approx. 15 minutes)

DIRECTIONS TO HOSPITAL EMERGENCY SERVICES

The Brooklyn Hospital (121 Dekalb Ave., Brooklyn, NY) from the Site



1. Head north on **Flatbush Ave** toward **4th Ave**
go 0.2 mi
total 0.2 mi
2. Turn right onto **Lafayette Ave**
About 1 min
go 0.2 mi
total 0.4 mi
3. Turn left onto **S Portland Ave**
About 50 secs
go 0.2 mi
total 0.6 mi
4. Turn left onto **Dekalb Ave**
Destination will be on the right
About 50 secs
go 0.1 mi
total 0.7 mi

The Brooklyn Hospital Center

121 Dekalb Avenue #9k, New York, NY 11205

ESTIMATED Driving Distance (Time): 0.7 miles (7 minutes)*ONLY DRIVE INJURED PERSONNEL TOMEDRITE URGENT CARE OR The BROOKLYN HOSPITAL IF THE INJURY IS CLEARLY MINOR (E.G., AMINOR BURN OR LACERATION). IF THERE IS ANY QUESTION OF THE SEVERITY OF AN INJURY, CALL FOR EMERGENCY MEDICAL SERVICES BY CALLING 911 ANDFOLLOWING THE PROCEDURES FOR EMERGENCY MEDICAL SERVICES FOR SEVERE INJURIES.

APPENDIX A
URS SAFETY MANAGEMENT STANDARDS

**URS SAFETY MANAGEMENT STANDARD 002
HAZARD COMMUNICATION (WORKER RIGHT-TO-KNOW)**

URS SAFETY MANAGEMENT STANDARD

Hazard Communication (Worker Right-to-Know)

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

This standard is not applicable to chemical laboratory operations that are covered under 29 Code of Federal Regulations (CFR) 1910.1450 (Occupational Exposure to Chemicals in Laboratories).

2. Purpose and Scope

The purpose of this Hazard Communication standard (also known as worker right-to-know program) is to provide URS personnel with information and training about safety and health hazards associated with the chemicals they may encounter in the workplace. This procedure describes how chemical safety hazards are communicated to URS personnel and how information is to be provided to employees of other companies working at the location. The requirements include steps to acquire this information, maintain the information, and train personnel in the hazard communication program.

3. Implementation

Implementation of this standard is the responsibility of the URS manager who directs activities at the facility, site, or project location. For office locations and large projects, this program may be incorporated into the general site orientation and training program or administered by project management.

4. Requirements

A. Hazardous Material Inventory

Maintain a hazardous material inventory that lists all of the hazardous materials used at each workplace (i.e., office, field location). Use chemical names consistent with the applicable material safety data sheet (MSDS).

B. Site-Specific Written Program

A site-specific written program may be prepared as a stand-alone document or included within a site-specific health and safety plan. The program must cover hazardous materials in all physical forms (liquids, solids, gases, vapors, fumes, and mists); regardless of whether they are “contained.”

C. Material Safety Data Sheets (MSDSs)

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Hazard Communication (Worker Right-to-Know)

1. The safety representative will obtain an MSDS for each chemical before it is used. MSDSs will generally be received by the person ordering the product. MSDSs for products frequently used should be kept on file because additional copies may not be included in repeat shipments.
2. The safety representative will review each MSDS when it is received to evaluate whether the information is complete and to determine whether existing protective measures are adequate.
3. Each office or project location will assign a responsible person or department to maintain a collection of all applicable and relevant MSDSs in an area that is accessible by all employees at all times. An electronic database is an acceptable method of maintaining the MSDSs.
4. The assigned person or department will replace MSDSs when updated sheets are received and will communicate any significant changes to those who work with the chemical.
5. MSDSs are required for all hazardous materials brought on site by project personnel.
6. General household products to be used for their specific purpose, as well as food, drugs, and cosmetics brought into the workplace for employee consumption, are exempt, as are supplies in the first aid kit, such as isopropyl alcohol and antibacterial wipes.
7. Subcontractors bringing hazardous materials on to a site or project must submit MSDSs to the safety representative. The safety representative may restrict the use of certain hazardous materials on a site or project due to occupational health risk, hazardous physical properties of the material, or potential employee sensitivity to odor or irritating properties of the material.

D. Labels

Unless each container has appropriate labeling, label all chemical containers with the following information:

1. Product name and identity of the hazardous chemical(s).
2. Appropriate hazard warnings.

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3. Name and address of the chemical manufacturer, importer, or other responsible party.

Labels on incoming containers of hazardous materials will not be removed or defaced.

Labels are also required when a hazardous substance is transferred from a primary container to a secondary container. Labels on secondary containers must indicate the product name or the names of the hazardous substances contained therein, as well as related physical and health hazards and their associated target organs.

Labels may incorporate words, pictures, symbols, or combinations thereof to ensure the appropriate information is provided to the end user. Examples of acceptable labeling systems include the National Fire Protection Association (NFPA) Diamond, the Hazardous Materials Identification System (HMIS), the Chemical Hazard Identification and Training (CHIT) system, or similar.

E. Hazardous Non-routine Tasks

Periodically, employees are required to perform hazardous nonroutine tasks. Prior to starting work on such projects, each employee must be provided with information about hazards to which they may be exposed, as follows:

1. Specific chemical hazards.
2. Protective/safety measures that must be taken.
3. Measures that have been taken to lessen the hazards, including ventilation, respirators, presence of another employee, and emergency procedures.

F. Informing Contractors/Subcontractors

Provide other contractors/subcontractors working in the same area with the following information on chemicals used by or provided to URS personnel:

1. Names of hazardous chemicals to which they may be exposed while on the jobsite.
2. Precautions the employees may take to lessen the possibility of exposure by usage of appropriate protective measures, such as

URS SAFETY MANAGEMENT STANDARD
Hazard Communication (Worker Right-to-Know)

ventilation or isolation of the work. In some cases, as an administrative control measure, a task may be delayed to a time when a minimal number of employees are present in the area.

3. Location of MSDSs.

G. Training

1. Provide training to all employees who have the potential to be exposed to hazardous materials, on the following schedule:
 - a. At the time of the initial task assignment,
 - b. Whenever new chemicals are introduced into the workplace, or
 - c. More frequently where required by site-specific conditions or client-specific requirements.
2. This training will include the following:
 - a. Applicable regulatory requirements.
 - b. Location of the program, inventory, and MSDS.
 - c. Site-specific chemicals used and their hazards (chemical, physical, and health), including:
 1. General characteristics of chemicals
 2. Signs and symptoms of exposure
 - d. How to detect the presence or release of chemicals including the location, types, and usage of any portable and fixed monitoring or detection equipment and their associated alarms, where applicable.
 - e. Safe work practices and methods employees can take to protect themselves from chemical hazards, including the use of respiratory protection.
 - f. How to read an MSDS.
 - g. Site- or project-specific information on hazard warnings and labels in use at the location, if applicable.

URS SAFETY MANAGEMENT STANDARD

Hazard Communication (Worker Right-to-Know)

- h. Site-specific evacuation and rescue procedures in the event of chemical release, including the location of staging areas and personnel accounting procedures.
3. Document the training.
4. Where non-English-speaking workers are employed, arrange provisions for training in the appropriate language. International Chemical Safety Cards (see Section 6, ILO) may be used in conjunction with MSDS information to provide non-English-language information. MSDSs are required to be on site, but there is no requirement for the MSDSs to be in a language other than English.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Chemical Inventory.
- B. MSDSs.
- C. Training records.
- D. Contractor/Subcontractor notifications.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) General Industry Standards – Hazard Communication – 29 Code of Federal Regulations (CFR) [1910.1200](#)
- B. U.S. OSHA General Industry Standards – Occupational Exposure to Hazardous Chemicals in Laboratories – [29 CFR 1910.1450](#)
- C. U.S. OSHA Construction Standards – Hazard Communication – [29 CFR 1926.59](#)
- D. Mine Safety and Health Administration – Hazard Communication – [30 CFR 47](#)
- E. OSHA Administration Technical Links – [Hazard Communication](#)

URS SAFETY MANAGEMENT STANDARD
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- F. National Paint and Coatings Association (NPCA) – [Hazardous Materials Identification System \(HMIS\) Version III](#)
- G. [National Fire Protection Association \(NFPA\) Standard 704](#) – Standard System for the Identification of Hazardous Materials for Emergency Response
- H. International Labour Organization (ILO) – International Chemical Safety Cards (information about 1613 chemicals in 18 languages).
<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm>
- I. Agency for Toxic Substances and Disease Registry (ATSDR) – Tox FAQs and Tox FAQs en Espanol, 2003. <http://www.atsdr.cdc.gov/toxfaq.html>

7. Supplemental Information

- A. [Hazard Communication Program – Template](#)
- B. [Hazard Communication Employee Training Program](#)



HAZARD COMMUNICATION PROGRAM

Table of Contents

- A. Purpose
- B. Identification of Hazardous Substances
- C. Container Labeling
- D. Material Safety Data Sheets (MSDS)
- E. Employee Training and Information
- F. Non-Routine Task Training
- G. Access to Information by Other Employees

Appendices

- I. Hazard Communication Checklist
- II. Potentially Hazardous Substances
- III. List of Jobsite Hazardous Substances
- IV. Sample Letter to Suppliers to Obtain MSDS

A. PURPOSE

A-1 To protect the health and safety of our employees, URS Corporation has developed this Hazard Communication program.

1. As an organization we intend to provide information about chemical hazards and other hazardous substances, and the control of hazards via our comprehensive Hazard Communication Program, which includes container labeling, Material Safety Data Sheets (MSDS), and training.
2. This written Hazard Communication Program applies to all operations that MAY expose employees to hazardous substances because of normal work conditions or as the result of a reasonably foreseeable emergency.
3. This written Hazard Communication Program is available, upon request, to employees, their designated representatives and to appropriate representatives of state and/or federal safety and health agencies.

A-2 Scope

This program is part of URS Corporation's comprehensive health and safety program and shall be applied in conjunction with that overall program.

A-3 Responsibilities

1. The Project Manager is responsible for implementing and ensuring compliance with this written hazard communication program. The Hazard Communication checklist found in Appendix I is provided to assist the Project Manager in carrying out this responsibility.
2. The designated Project Safety Representative is responsible for coordinating and administering the program, in developing and assisting in the presentation of training materials and in providing technical assistance to project supervision.
3. Each Project Supervisor shall become familiar with the hazard communication procedures and shall supervise the application of these procedures to tasks for which they are responsible.
4. The Safety Manager is the designated safety professional for the project or office location and is responsible for providing technical assistance to the Project Supervisor or Safety Representative to implement the hazard communication program.

B. IDENTIFICATION OF HAZARDOUS SUBSTANCES

- B-1 "Hazardous Substances" are materials or mixtures that are or have physical or health hazards (See Appendix II for examples of potentially hazardous materials).
- B-2 "Exposure" is any situation arising from work conditions where an employee may ingest, inhale, absorb or otherwise come in contact with a hazardous substance.
- B-3 A master list and the MSDSs of all of the hazardous substances to which employees may be exposed on this jobsite shall be maintained in the project office (see Appendix III).

C. CONTAINER LABELING

- C-1 When hazardous substances are received, the project safety representative shall examine the containers to determine if the labels provide the following information (primary containers):
1. The identity of the hazardous substances they contain;
 2. Appropriate warnings of the physical and health hazards associated with those substances;
 3. The name and address of the chemical manufacturer or distributor.
- C-2 When hazardous substances are transferred into portable or secondary containers, the responsible Project Supervisor shall ensure that these containers are labeled with an extra copy, of the manufacturer's label or with a printed label that includes the information in one (1) and two (2) above.
- EXCEPTION: When an employee transfers a hazardous substance into a portable container for his/her own immediate use, within the work shift the portable container need not be labeled.
- C-3 Each Project Supervisor shall ensure that the labels on containers of hazardous substances are not removed or defaced, unless the containers are immediately relabeled with the information in C-1 above. The labels shall be written legibly in English. However, for non-English speaking employees information may be presented in their native language as well.
- C-4 Containers without complete labels or with defaced labels will not be used on the job.
- C-5 The Project Supervisor or Safety Representative shall review the jobsite labeling procedure at least quarterly and update as required.

D. MATERIAL SAFETY DATA SHEETS (MSDS)

- D-1 Material Safety Data Sheets (MSDSs) are documents that supply information about a particular hazardous substance or mixture. Manufacturers are required to provide MSDSs when the hazardous substances are sold to distributors or purchasers. In most cases, MSDSs are sent to the purchaser of the project (e.g. the procurement department or Project Supervisor) not the safety department.
- D-2 The Safety Manager / Project Safety Representative or Project Supervisor in coordination with the purchasing agent or project business manager, will be responsible for obtaining and maintaining the master sets of MSDSs and other information on all hazardous substances used (see sample letter in Appendix IV).
- D-3 The Project Safety Representative will review MSDSs for completeness. If an MSDS is missing or obviously incomplete, a new MSDS will be requested from the manufacturer. In some cases, MSDSs may be obtained on-line through the manufacturer's web site. The Project Safety Representative should review products for highly toxic or dangerous constituents prior to use and consult with the Safety Manager for any items considered hazardous or toxic.
- D-4 MSDSs are available to all employees in their work area for review during each work shift. If MSDSs are not available or new hazardous substance(s) in use do not have MSDSs, contact the Project Safety Representative immediately. Additional information such as chemical safety cards and the NIOSH Pocket Guide to Chemical Hazards may be used for additional information.
- D-5 Project Supervisors shall be alert to other employees (such as subcontractors) whose work on the jobsite may expose employees to additional hazardous substances. When it appears such exposure will occur, MSDSs for the substances must be obtained.
- D-6 When doing renovation or remodeling work, the Project Supervisor shall coordinate MSDSs of hazardous materials used by contractors. Contractors bringing hazardous materials on to a site or project must submit MSDSs to the Project Supervisor. The Project Supervisor should consult with the Safety Manager if there are any questions regarding hazardous constituents of products.

E. EMPLOYEE TRAINING AND INFORMATION

- E-1 Initial Orientation

Before starting work, each new employee must attend a health and safety orientation. Also, URS Corporation's on-line training program on Hazard Communication may be used as a component of the initial training but employees still require site specific information on hazards of chemicals in use, site specific spill and emergency procedures, and site specific labeling systems as described below.

- E-2 Training shall be provided before employees are assigned duties that may cause exposure to hazardous substances. Training shall also be given when new hazardous substances are introduced into the work area or when an MSDS is changed. In general, this training shall include:
1. Information on which hazardous substances are in the work area.
 2. How to read and interpret information on MSDSs and labels.
 3. Any physical or health hazards associated with the use of a hazardous substance or mixture being used in the work area.
 4. Proper precautions for handling, including specific procedures the company has implemented to protect workers from exposure such as personal protective equipment and work practices.
 5. Proper procedures for reporting of releases or threatened releases of hazardous substances.
 6. Emergency procedures for spills, fires, disposal and first aid.
 7. The methods and observations that can be used to detect the presence of a hazardous substance in the work place (odor, visual appearance or monitoring).
 8. The right of employees, their physicians or their collective bargaining agents to receive information on hazardous substances to which they may be exposed.
 9. The right against discharge or discrimination due to an employee's exercise of the rights afforded by law.
 10. The details of this written Hazard Communication Program; the availability and location of this written Hazard Communication Program and of MSDSs or other information.
- E-3 Hazard communication training must be documented.
- E-4 Additional training shall be provided as needed during the weekly safety and health training ("toolbox") meetings in order to emphasize the safe handling, use and storage of onsite hazardous substances.

F. NON-ROUTINE TASK TRAINING

- F-1 When employees are assigned to a non-routine task that may expose them to a hazardous substance for which they have not been trained, they shall be trained in the manner required by Section E.
- F-2 Some examples of non-routine tasks are:
- Confined space entry.
 - Tank cleaning.
 - Reactor vessels.
 - Repair of pipes or tanks containing hazardous substances.

Prior to starting work on such projects, each affected employee will be given information about the hazardous chemicals he or she may encounter during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps the jobsite is using to reduce the hazards, including ventilation, respirators, presence of another employee and emergency procedures including site specific warnings, evacuation routes, and assembly points.

G. ACCESS TO INFORMATION BY OTHER EMPLOYERS

- G-1 It is the responsibility of the Project Safety Representative or Project Supervisor to provide contractors and subcontractors with information about hazardous chemicals their employees may be exposed to on a jobsite and suggested precautions for the contractor's employees to follow to avoid exposure to hazardous conditions.
- G-2 Contractors and subcontractors on the job site with potential exposure or risk will be contacted before work is started, to gather and distribute information concerning any chemical hazard that they may bring or be exposed to, in areas that are under URS Corporation control.

APPENDIX I**HAZARD COMMUNICATION CHECKLIST**

- _____ 1. Have we prepared a list of all the hazardous chemicals in our workplace?
- _____ 2. Are we prepared to update our hazardous chemical list?
- _____ 3. Have we obtained or developed a material safety data sheet for each hazardous chemical we use?
- _____ 4. Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and data sheets?
- _____ 5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?
- _____ 6. Are our employees aware of the specific information and training requirements of the Hazard Communication Standard?
- _____ 7. Are our employees familiar with the different types of chemicals and the hazards associated with them?
- _____ 8. Have our employees been informed of the hazards associated with performing non-routine tasks?
- _____ 9. Do our employees understand how to detect the presence or release of hazardous chemicals in the workplace?
- _____ 10. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work area?
- _____ 11. Does our training program provide information on appropriate first aid, emergency procedures and the likely symptoms of overexposure?
- _____ 12. Does our training program include an explanation of labels and warnings that are used in each work area?
- _____ 13. Does the training describe where to obtain data sheets and how employees may use them?
- _____ 14. Have we worked out a system to ensure that new employees are trained before beginning work?
- _____ 15. Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?
- _____ 16. Do we have a system for informing employees when we learn of new hazards associated with a chemical we use?
- _____ 17. Have the employees been advised of the consequences for failure to follow established procedures?
- _____ 18. Do we have a system to ensure Subcontractors are sharing information with one another, concerning the hazardous chemicals they have brought to the site?

APPENDIX II**EXAMPLES OF POTENTIALLY HAZARDOUS MATERIALS THAT MAY BE
FOUND ON URS CORPORATION
CONSTRUCTION AND GENERAL INDUSTRY PROJECTS**

Acetone	Kerosene
Acetylene gas	Lead
Adhesives	Lime (calcium oxide)
Aluminum etching agent	Limestone
Ammonia	Lubricating oils
Anti-freeze	Lye (sodium hydroxide, potassium hydroxide)
Arsenic compounds	Magnesium
Asbestos	Metals (aluminum, nickel, copper, zinc, cadmium, iron, etc.)
Asphalt (Petroleum) fumes	Methanol (methyl alcohol)
Battery Fluids	Methyl ethyl ketone (2-butanone)
Benzene (and derivatives)	Motor oil additives
Bleaching agents	Muriatic acid (hydrochloric acid)
Carbon black	Naptha (coal tar)
Carbon monoxide (in cylinders)	Nitroglycerin
Caulking, sealant agents	Oxalic acid
Caustic soda (sodium hydroxide)	Ozone
Chromate salts	Paint remover
Chromium	Paint stripper
Cleaners	Paints/lacquers
Cleaning agents	Particle board
Coal tar pitch	Pentachlorophenol
Coal tar epoxy	Pesticides
Coatings	Photographic developers and fixers
Cobalt	Photogravure ink (copy machine)
Concrete curing compounds	Plastics
Creosol	Polishes for metal floors
Cutting oil (oil mist)	Propanol
De-emulsifier for oil	Putty Resins, epoxy/synthetics
Diesel gas, diesel oil	Sealers
Drywall	Shellac
Dusts (brick, cement block)	Solder, flux (zinc chloride, fluorides, etc.)
Enamel	Solder, soft (lead, tin)
Etching agents	Solvents
Ethyl alcohol	Sulfuric acid
Fiberglass, mineral wool	Thinner, paint/lacquer
Foam insulation	Tin
Freon 20, R20 (and others)	Transite
Gasoline (petrol, ethyl)	Turpentine, gum spirit, oil of turpentine
Glues	Varnishes
Graphite	Waterproofing agents
Greases	Waxes
Helium (in cylinders)	Welding Rods
Hydraulic brake fluid	Wood alcohol (methanol)
Hydrochloric acid	Wood preservative
Hydrogen (in cylinders)	Xylene
Inks	Zinc
Insulations	
Iron	

	<p style="text-align: center;">Health, Safety and Environment HAZARD COMMUNICATION PROGRAM - TEMPLATE</p>	<p style="text-align: right;">SMS 002 NA Supplemental Information A Issue Date: February 2009 Revision 2: August 2010</p>
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APPENDIX III

LIST OF PROJECT SPECIFIC HAZARDOUS SUBSTANCES

On the following page(s) is a current list of the specific hazardous substances and the manufacturer's name of the product known to be present at this jobsite.

This list uses the chemical name referenced on the MSDS. Specific information on each substance may be found on the MSDSs located in the project office.

	<p style="text-align: center;">Health, Safety and Environment HAZARD COMMUNICATION PROGRAM - TEMPLATE</p>	<p style="text-align: right;">SMS 002 NA Supplemental Information A Issue Date: February 2009 Revision 2: August 2010</p>
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APPENDIX IV

(PROJECT LETTERHEAD)

Date

Product Manufacturer's Name
Product Manufacturer's Address

Subject: Material Safety Data Sheet Requisition

Dear Manufacturer:

Please provide the following material safety data sheet(s):

Thank you for your support and assistance in this matter.

Sincerely,

Requestor's Name
Requestor's Address

This document presents information that can be used for hazard communication training.

This information has been developed based on groups (types) of hazardous substance(s) used and the common hazards associated with them.

For specific hazard information on each brand of material the MATERIAL SAFETY DATA SHEETS (MSDS) must be reviewed.

OVERVIEW OF THE HAZARD COMMUNICATION REGULATION

The Hazard Communication Regulation is intended to ensure that both employers and employees are aware of the dangers associated with hazardous substances in their workplaces. The following information is a review of the specific requirements of a hazard communication program, including container labeling, MSDS and training.

WRITTEN HAZARD COMMUNICATION PROGRAM

We have a written program that outlines how we will provide information and control your exposure to hazardous substances. This plan is available for your review during our training and at the project office for review during your work shift.

HAZARDOUS SUBSTANCES USED IN OUR WORKPLACE

On this job, we use a variety of products. Many of these products contain one or more hazardous substances. Let's review the HAZARDOUS SUBSTANCE INVENTORY LIST in your work area.

READING LABELS AND MSDS

LABELS: A product label on both the original and secondary containers should be reviewed prior to working with the material. Each label will have three important pieces of information you should be familiar with:

1. The identity of the Hazardous Substance.
2. Hazard Warnings.
3. Target Organs.

The label on the original container will also state the name and address of the manufacturer.

The label should act as a visual reminder of the information we have presented in this training session and of the information found in more detail on the MSDS. It is essential for your safety that you read the Hazard Warning and only use the Hazardous Substance(s) within the guidelines prescribed on the label. Questions concerning the label should be directed to your supervisor/foreman.

	<p align="center">Health, Safety and Environment</p> <p align="center">HAZARD COMMUNICATION</p> <p align="center">EMPLOYEE TRAINING PROGRAM</p>	<p align="right">SMS 002 NA Supplemental Information B</p> <p align="right">Issue Date: February 2009 Revision 2: August 2010</p>
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MATERIAL SAFETY DATA SHEETS (MSDS): The MSDS is the primary means we will use to convey the necessary information about the hazards of the substances we use. The manufacturers and importers are responsible for providing us with the MSDS. The manufacturer must provide us with adequate information to use the substance safely.

PHYSICAL AND HEALTH HAZARDS OF THE HAZARDOUS SUBSTANCE(S) USED

Employees are to be trained specifically about the hazards of the substances in their work areas. This may be done by specific Hazardous Substance(s) or by categories of hazards, but in any case, the employee is to be aware that information is available on the specific hazards of individual Hazardous Substances through MSDSs.

Employees may be trained using the common type or generic chemical group or by reviewing the specific MSDS as long as the training includes the following information:

1. Measures to protect employee from the hazards (i.e., work practices, engineering controls and the use of personal protective equipment).
2. The physical and health hazards of the Hazardous Substance(s).
3. Detection of release of the substance; emergency and first aid procedures.

EXAMPLE OF GENERAL HAZARDOUS SUBSTANCE GROUP TYPE TRAINING

Product/Chemical Group: Hydrocarbon Solvents.

Health Effects – Effect of Overexposure: High concentrations of solvent vapors are irritating to the eyes, nose, throat and lungs, may cause headaches and dizziness and sleepiness. Even higher levels may cause unconsciousness and may have other brain and central nervous system effects.

Prolonged or repeated liquid contact with the skin may cause defatting of the skin, leading to dryness, possible irritation and dermatitis (reddening and inflamed skin). Some solvents are absorbed right through the skin and the health effects are just as if the solvent vapor was inhaled.

Each organic solvent's possible long term health effects will vary; however, prolonged solvent exposures are related to possible liver, kidney and central nervous system and brain damage (NOTE: THE VARIETY OF SOLVENT TYPES SHOULD BE REVIEWED).

Physical Hazards: Hydrocarbon solvents are flammable and combustible and represent fire and explosion hazards if the materials are not handled correctly. Hydrocarbon solvents are generally stable and will not react violently with water. Review the MSDS section on Fire and Explosion Hazard information. Most solvents will vaporize rapidly and become airborne.

Detection of Release: Odor – Solvent vapor may produce an odor or cause your nose or eyes to be irritated, but do not depend on odor to warn you. Odor thresholds (lowest level that can be detected) for most solvents vary widely from person to person. Also, some solvents produce “olfactory fatigue” - the rapid loss of ability to smell the odor. However, odor can warn you of exposure to some solvents (confirm this with industrial hygiene monitoring).

Appearance – Most solvent vapors are invisible so do not rely on appearance to warn you for exposure.

Instrumentation – A variety of industrial hygiene instruments can be used to measure employee exposure. This equipment should be operated only by qualified personnel.

Emergency Response – For Flammable Solvents: If the material is spilled or leaks, shut-off and eliminate all sources of ignition. Recover the free product by adding absorbents to the spill. Minimize breathing vapors and skin contact. Ventilate the area by opening windows and doors. Follow the established hazardous waste disposal procedures.

Exposure Control: Protective Equipment, Engineering Controls and Proper Work Practices:

- Protective Equipment – Use chemical-resistant gloves, aprons or clothing if prolonged or repeated skin contact may occur. Use splash goggles and face shield when eye or face contact may occur. Use approved respiratory protective equipment as established by our Safety Program (NOTE: if needed, a review of the respiratory protective program may be appropriate).
- Engineering Controls/Work Practices – Ventilation is to be used when it is necessary to prevent build-up of vapors from both a health or fire and explosion concern. Keep containers closed when not in use. Do not handle or store near heat or sources of ignition or strong oxidants. No smoking, burning or welding is permitted near the flammable vapors. Use the bonding and/or grounding system when transferring materials. Most solvents will vaporize rapidly and become airborne.

APPROPRIATE EMERGENCY AND FIRST AID PROCEDURES

Eye contact – If splashed into the eyes, flush with water for 15 minutes or until irritation subsides. If irritation continues, call a physician.

Skin contact – In case of skin contact, remove any contaminated clothing and wash skin thoroughly with water and soap.

Inhalation – If overcome by vapors, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation.

Ingestion – If ingested, DO NOT induce vomiting, call emergency medical aid immediately.

HAZARDOUS PROPERTIES OF CHEMICALS TRAINING

Chemicals are a part of every aspect of our lives. A minute does not go by that we do not use something that contains chemicals, or chemicals were used in the manufacturing process. The chemicals you use in the work place only present potential health and physical hazards when they are mishandled, improperly used, incompatible mixtures combined, improperly stored or labeled.

Depending upon the chemical and the level of exposure, health hazards can vary from minor skin irritations to serious chemical burns, nerve damage, different forms of cancer and even death. Physical damage may include fires, explosions, property and environmental damage.

Hazard awareness is recognizing and understanding the potential injuries and illnesses or physical damage the chemicals can cause. The communication of this information is essential for your being aware of, understanding and respecting the potential hazards. This knowledge is important for the decisions you make concerning how you use the chemicals and the safe work practices you follow.

Remedial action response personnel may be exposed to a number of substances that are hazardous because of their properties. These properties can be summarized into three broad categories:

- a. physical/chemical
- b. biological
- c. radiological

It should be noted that many hazards may be present at any one time. It is important to understand the fundamentals of each of these properties and their relationships so that effective safety practices may be employed to reduce the risk to the public and remedial response personnel. Some hazards that may be encountered at this work site are toxic substances, flammable materials, explosive materials, corrosive materials, biological agents, excessive noise, heat or cold stress, oxygen deficient work areas, and radioactive materials.

PHYSICAL/CHEMICAL PROPERTIES

Physical hazards. Chemical compounds possess inherent properties, which determine the type and degree of the hazard they represent. Evaluating risks of an incident depends on understanding these properties and their relationship to the environment.

- a. Solubility. The ability of a solid, liquid, gas or vapor to dissolve in a solvent is solubility. An insoluble substance can be physically mixed or blended in a

solvent for a short time but is unchanged when it finally separates. The solubility of a material is important when determining its reactivity, dispersion, mitigation and treatment.

- b. Density. The density of a substance is its mass per unit volume, commonly expressed in g/cc.
- c. Specific gravity. Specific gravity is the ratio of the density of a substance to the density of water. If the specific gravity of a substance is greater than 1 it will sink in water. The substance will float in water if its specific gravity is less than 1.
- d. Vapor density. The vapor density is the density of a gas compared to the density of air. If the density of a gas is greater than that of air then the gas will tend to pocket and settle into the lowest points. If the vapor density is close to air or lower than air then the gas will disperse. If the vapor or gas displaces oxygen in the low spots then it can become an asphyxiant problem. If the gas or vapor is an explosive, when it pockets it will become an explosive hazard.
- e. Flashpoint. If the ambient temperature in relation to the material of concern is right, then it may give off enough vapor at its surface to allow ignition by an open flame or spark. The minimum temperature at which a substance produces sufficient flammable vapors to ignite is its flashpoint. If the vapor does ignite, combustion can continue as long as the temperature remains at or above the flashpoint. The relative flammability of a substance is based on its flashpoint. An accepted relation between the two is:
- | | |
|-------------------------|----------------------------|
| Highly flammable: | Flashpoint <100°F |
| Moderately flammable: | Flashpoint >100°F & <200°F |
| Relatively inflammable: | Flashpoint >200°F |
- f. Chemical Hazards. Hazardous conditions that may exist because of the chemical nature of substances may be summarized as fire hazards, explosive hazards, corrosive hazards, and chemical reactivity.

Fire Hazards

- a. Combustibility: Combustibility is the ability of a material to act as a fuel, that is, to burn. Materials that can be readily ignited and sustain a fire are considered to be combustible, while those that cannot are called noncombustible. Three elements are required for combustion to occur: fuel, oxygen, and heat. The concentration of the fuel and the oxygen must be high enough to allow ignition and maintain the burning process. Combustion is a chemical reaction that requires heat to proceed. Heat is supplied by the

ignition source and is maintained by the combustion, or it must be supplied from an external source. The relationship of these three fire components can form a triangle. If one leg of the triangle is removed, then the fire can be extinguished. For example, water applied to a fire removes the heat, thereby extinguishing the fire. When a material generates enough heat by itself to self-ignite and combust, spontaneous combustion occurs, either as a fire or explosion (e.g., diesel greater than 140 degrees Fahrenheit is combustible.)

- b. Flammability: Flammability is the ability of a material (liquid or gas) to generate a sufficient concentration of combustible vapors under normal conditions to be ignited and produce a flame. It is necessary to have a proper fuel-to-oxygen (oxygen) ratio (% fuel in air) to allow combustion. A flammable material is considered highly combustible if it can burn at ambient temperatures. But a combustible material is not necessarily flammable because it may not be easily ignited or the ignition maintained. Pyrophoric materials will ignite at room temperature in the presence of a gas or vapor or when a slight friction or shock is applied.

The substances listed below are easily ignited (pyrophorics), require little oxygen to support combustion, have low flammability limits and explosive limits and a wide flammable and explosive range.

Flammable liquids

Aldehydes
 Ketones
 Amines
 Ethers
 Aliphatic Hydrocarbons
 Aromatic Hydrocarbons
 Alcohols
 Nitroaliphatics

Flammable solids

Phosphorus
 Magnesium Dust
 Zirconium Dust
 Titanium Dust
 Aluminum Dust
 Zinc Dust

Water Reactive Flammable Solids

Potassium
 Sodium
 Lithium

Pyrophoric Liquids

Organometallic compounds
 Dimethyl Zinc
 Tributyl Aluminum

Some of the hazards related to fires and explosions can cause physical destruction due to shock waves, heat, and flying objects. Secondary fires can be created as well as other flammable conditions. Toxic or corrosive compounds may also be released to the surrounding environment as well.

Explosives

An explosive is a substance, which undergoes a very rapid chemical transformation producing large amounts of gases and heat. The gases

produced, for example, nitrogen, oxygen, carbon monoxide, carbon dioxide, and steam, due to the heat produced, rapidly expand to velocities exceeding the speed of sound. This creates both a shockwave (high pressure front) and noise. The main categories of explosives are listed below.

High or detonating – produces a shock wave followed by combustion.

Primary high explosive – detonation occurs in a short time. Examples: lead azide, mercury fulminate, and lead styphnate.

Secondary high explosive – needs a booster to detonate. Examples: Tetryl, cyclonite, dynamite and TNT

Low or deflagrating – Explosive rate very fast. Combustion followed by a shock wave. Examples: smokeless powder, magnesium, and molotov cocktail.

Corrosive Hazards

Corrosion is a process of material degradation. Upon contact, a corrosive material may destroy body tissues, metals, plastics, and other materials. Corrosivity is the ability of material to increase the hydrogen ion concentration of a material or to transfer electron pairs of or from itself or another material. A corrosive material is a reactive compound or element that produces a destructive chemical change in the material it is acting on. Common corrosives are:

Halogens

Bromine
Chlorine
Fluorine
Iodine

Acids

Acetic acid
Hydrochloric acid
Hydrofluoric acid
Nitric acid
Sulfuric acid

Bases (Caustics)

Potassium Hydroxide
Sodium Hydroxide

Skin irritation and burns are typical results when the body contacts an acidic or basic corrosive material.

The measure of an acid or a base is the pH scale. The pH scale ranges from 0 to 14 with a pH <7 being acidic and a pH >7 being basic. The lower the pH of the acid the more acidic is the material, and the higher the pH of the base the more basic the material. A pH of 7 is considered neutral.

Chemical Reactivity

- a. Reactivity hazards. A reactive material is one that undergoes a chemical reaction under specified conditions. Generally, the term “reactive hazard” is used to refer to a substance that undergoes a violent or abnormal reaction in

the presence of water or under normal ambient atmospheric conditions. Among this type of hazard are the pyrophoric liquids that will ignite in air at or below normal room temperature in the absence of added heat, shock, or friction, and the water-reactive flammable solids that will spontaneously combust upon contact with water.

The most common reactive mixture in construction is found in gas welding or brazing. Acetylene gas mixes with oxygen to provide an extremely powerful reaction in the form of a very intense flame.

- b. Compatibility. If two or more hazardous materials remain in contact indefinitely without reaction, they are compatible. Incompatibility, however, does not necessarily indicate a hazard. For example, acids and bases (both corrosive) react to form salts and water, which may not be corrosive.

The compatibility of materials must be determined before the materials are used or stored. Some examples of incompatibilities are sulfuric acid and plastics (toxic gas or vapor is produced), acids and metal (flammable gas or vapor is produced), chlorine and ammonia (chlorine gas is created, toxic gas). There are many other incompatibilities that may be found. Check to make sure that the materials used for a project are compatible.

All of the hazards listed above will be found on the material safety data sheet (MSDS). The MSDS is a short technical report that provides you with the known hazards of a specific material. The MSDS explains how to properly use the material, handle any problems related to the material and how to store the material. Know what the MSDS says for the materials that you work with.

All materials should have a label on them. This is the first and easiest place to look to see if a material is hazardous. Labels should tell you any precautions that must be taken when handling the material. Read the label on the materials that you use and abide with the cautions and warnings. If a material is not properly labeled, notify your supervisor so that the problem is corrected.

BIOLOGICAL HAZARDS

Biological agents are living organisms that can cause sickness or death to exposed individuals. Biological hazards can cause infection or disease to persons who are exposed.

Biological hazards may involve plants or animals including microorganisms. Biological hazards, such as disease causing agents, may be present at a hazardous waste site or involved in a spill. Like chemical hazards, they can be dispersed throughout the environment via wind and water.

Many biological agents require a carrier to inoculate a person. For instance, rabid rodents at a landfill may be a biological hazard. Deer carry ticks that may have Rocky Mountain Spotted fever; prairie dogs will not.

The same personnel protective requirements for a response to a chemical hazard apply to biological hazards. Body coverings and respiratory protective equipment might have to be utilized. Especially important is the need to maintain personnel cleanliness. Before eating, drinking or smoking residual contamination should be washed off.

BIOHAZARDS

Biohazard training will be provided to employees as per the blood borne pathogen program on biohazardous materials.

HAZARDOUS MATERIAL PROTECTION

The routes of exposure for hazardous materials include the following:

- Inhalation – Breathing contaminated air (e.g. welding fumes.)
- Skin Absorption – Contact with harmful liquids, gases, solids or contaminated clothing, equipment, medications, cosmetics, etc. A good example is solvents. Materials can also enter through an open wound.
- Ingestion – Eating or drinking contaminated foods, water or medications. (Remember food and cigarettes can become contaminated by your unwashed hands, gloves, equipment. Good hygiene practices are very important.)
- Injection – A contaminated material can be injected into some part of the body.

Protection from potentially hazardous materials include the following:

- Use good personal hygiene. This is the simplest control measure to chemical hazards.
- Know what protective equipment is required for the specific job you are doing. Ask your supervisor what risks you might encounter and what hazardous substances you are working with.
- Know what potential explosive and or flammable conditions may exist with the job you are doing.
- Have all confined spaces checked for explosives, hydrogen sulfide, carbon monoxide, and oxygen deficiency. Know what hazards are involved with confined spaces.
- Know where emergency equipment is located and how to use it. For example know where the nearest fire extinguisher is from your work area.

- Know the standard operating procedures for rescue and emergency situations.
- Know the proper method for decontamination when working with hazardous materials.
- Use the buddy system when at all possible. Keep communication lines open when working with hazardous materials.
- Stay out of contaminated areas if you are not properly trained, equipped, or authorized to enter. Do not take chances with life-threatening materials or situations.

PERSONAL PROTECTIVE EQUIPMENT

Different types of protective equipment will be required depending on the substances to be handled, the existing conditions, and the particular situation. Personal protective equipment includes a variety of special suits, hard hats, goggles, face shields, aprons, boots, gloves, and respirators. Each is designed to protect you from certain hazards. It is important for you to know the advantages and disadvantages of all the equipment you may use or need. Use all equipment as instructed and follow all written procedures for the specific equipment.

STANDARD OPERATING PROCEDURES FOR EMERGENCY SITUATIONS

Standard operating procedures exist for any unexpected event such as an accident, fire, explosion, etc.

If you know or suspect that you have been contaminated with a hazardous substance, **TELL YOUR SUPERVISOR**. You should know the general symptoms of over-exposure to toxic substances. These include:

- Irritation of skin, eyes, nose, throat, or respiratory tract
- Changes in complexion or skin discoloration
- Headache
- Difficulty in breathing
- Nausea
- Dizziness or light-headedness
- Excessive salivation (drooling)
- Lack of coordination
- Blurred vision
- Cramps and/or diarrhea
- Changes in behavior patterns

You should know the location of emergency eyewash and shower facilities.

Before you enter, and periodically while you are working in confined spaces such as tanks, crawl spaces, ditches, etc., the air in the space should be tested by a qualified individual for oxygen content, explosive levels, gases, and contamination of hazardous materials.

Understand the site emergency response procedures and know the locations of response equipment before the need arises. If you must rescue someone, use proper precautions and protective equipment. **DO NOT BECOME A CASUALTY YOURSELF**. Move the affected person from the hazardous exposure if possible. Get help and follow emergency rescue procedures.

For spills and leaks of hazardous materials limit the leak or spill as quickly as possible. Small spills should be cleaned up immediately. If a valve must be closed to prevent a spill from continuing then do so. If the spill is large, or your skin, eyes or clothing are contaminated, leave the work area immediately. Wash eyes, skin, and clothes off with lots of water to remove the material. Get to fresh air. Notify your foreman or supervisor as soon as it is safe for you to do so. Unless you have special training and the proper protective equipment, do not try to clean up large spills yourself.

If a corrosive material is splashed in your eyes or on your skin and clothes, deal with it immediately. Wash the affected area with plenty of water (at least 15 minutes with a continuous stream). Remove any contaminated clothing. Get to fresh air if you feel burning in the nose, throat or lungs. Do not vomit if you have swallowed a corrosive material. Drink large quantities of water to dilute the material, and seek immediate medical attention.

EXAMPLES OF HAZARDOUS MATERIALS POSSIBLY FOUND ON SITE

SOLVENTS

Solvents are among the most common toxic materials in the workplace. Many processes, mixing and cleaning, use or give off solvent vapors. They are also used as thinners in paints and adhesives. Solvents vary in their toxicity from practically non-toxic materials such as the alcohols, ketones, halogenated solvents, to the very toxic such as dimethyl acetamide, methyl acrylate and other materials. Some solvents are also flammable or reactive.

Solvents can cause irritations to the eyes and skin when in high concentrations. Most will dissolve the protective layer of oils on the skin and leave it looking white in the small cracks. They should never be used to clean the skin; if there is a problem with contamination, some form of glove or barrier cream should be used to protect the skin. The early signs of overexposure often include headaches, dizziness, nausea and other related symptoms.

METALS AND SOLID PARTICULATES

Examples: Babbitt metal, cadmium, galvanized metal, lead, manganese, nickel, zinc

Metals and other particulate solids can be toxic and are usually given off when welding or grinding. Some, like gypsum dust are only nuisance dusts, while others, like zinc fume from welding cause flu-like symptoms. Others, like asbestos have been linked to cancer and other chronic diseases. Dusts can irritate the skin and be ingested with food, drinks or smoking materials if they aren't washed off the hands and removed from clothing. They may also be carried home to family members and cause problems there if they are not washed off before leaving the work area.

When the welding, brazing, grinding or cutting of metal is performed, care should be taken to avoid breathing the fumes or dusts. Local exhaust ventilation should be used to reduce your exposure. If fumes and dust cannot be controlled with exhaust ventilation, appropriate approved respirators should be used. Approved safety goggles and gloves should be worn when working with metals. Gloves may be necessary to prevent skin sensitization and dermatitis.

ACIDS

Examples of acids found on URS Corporation sites are sulfuric acid (used in water treatment plants and found in batteries), hydrochloric acid, and nitric acid. Acids are considered corrosives and cause material degradation. Acids destroy tissues, metals and other materials. Acids can cause skin irritations in the form of rashes or other types of dermatitis, and more severe problems such as skin or eye burns. When working with acids proper eye and face protection should be worn as well as hand protection.

LUBRICANTS, COOLANTS AND MACHINE OILS

Lubricants, coolants and machine oils are common in construction sites. There are three types: petroleum based (straight oils), water based, and synthetic fluids that contain no oils. Many cutting oils contain additives to inhibit corrosion, prevent bacterial growth and permit high temperature operation. The fumes and mist from cutting operations can be irritating to the eyes and lungs. Skin exposure can result in acne-like conditions and can cause other problems. Avoid breathing mist and fumes and use gloves and aprons to minimize contact with materials.

GASES

Examples: Acetylene, ammonia, carbon dioxide, carbon monoxide, freon, oxygen, hydrogen, liquefied petroleum gas, propane

Gases present a range of problems. Some, like nitrogen, are simple asphyxiates. They prevent the body from getting enough oxygen by displacing it from the air stream. Some are chemically hazardous, like carbon monoxide, or nitrous oxide, which cause poisoning of the body systems. Some are very toxic, like arsine and phosphine. Some are very reactive and should be dealt with in very careful manners. Other gases, like hydrogen, oxygen and acetylene are explosives and must be treated with great care. Chains and stands should secure all compressed gas cylinders at all times, and only the proper fittings should be used. Liquefied and petroleum gases are extremely flammable and considered simple asphyxiates.

PLASTICS, EPOXIES AND POLYMERS

Plastics, epoxies and polymers are a growing group of industrial chemicals. Materials such as polystyrene, polypropylene, acrylates, vinyl, and polyurethane are but a few. Although most of these materials are not toxic in their final form, where they are being molded, extruded, laid up, there can be significant hazards. When burned, these materials can be very hazardous.

CLEANERS

Cleaners contain acid, alkalis, aromatics, surfactants, petroleum products, ammonia and hypochlorite. Because of these ingredients these materials are considered to be irritants, and can be harmful to you if swallowed or inhaled. Many may cause eye, nose, throat, and skin and lung irritation. Some cleaners are flammable and burn easily. Others may be caustic or corrosive and cause severe skin burns. Because many cleaners used in the job area are consumer products commonly found in our homes, you may underestimate the hazard they pose. Protect yourself from these hazards by reading the labels and following the recommended precautions. Wear gloves and eye protection. Avoid inhaling the vapors and mists. Wash your hands and face thoroughly before eating, drinking or smoking.

Specific emergency procedures for each chemical will be detailed on that cleaner's material safety data sheet. In general, if a cleaning chemical gets into your eyes, flush the eyes with clean running water for at least 15 minutes, then seek medical attention. If the chemical gets on your skin, wash the area of contact and seek medical attention.

Do not mix two cleaning chemicals together, unless specifically told to do so by your supervisor. For example, the dangerous gas, chlorine, will be created if you mix bleach and ammonia or bleach and drain cleaner together.

Examples: Abrasive cleaners, bleach, drain cleaner, general purpose cleaning spray, germicide, and glass cleaner, metal cleaner, rug and upholstery cleaners, stain remover.

FUELS

Examples: Diesel oil, gasoline, propane, kerosene

The primary hazard posed by fuels is obviously, fire. Fuels are either flammable or combustible. Whether flammable (a material which is easily ignited and burns with extreme rapidity) or combustible (a material capable of fueling a fire), they should be handled with care.

Proper storage and transport of fuels in approved, self-closing, safety containers is extremely important and should be strictly adhered to at all times. When filling portable containers with flammable materials they should be properly grounded and bonded to the container to prevent ignition from static electricity.

Store gasoline in containers marked "gasoline". Store kerosene in containers marked "kerosene". Never use kerosene containers for the transport or storage of gasoline.

Excessive skin contact with fuels can result in dermatitis. Some petroleum products have been shown to cause skin tumors. Inhalation of fuel vapors over a long period of time can cause central nervous system depression, and may aggravate any existing respiratory problems that may exist. Ingestion of fuels can cause poisoning. Do not induce vomiting. If fuels get in your eyes, rinse with clean water for at least 15 minutes and seek medical attention.

LABELING

Proper labeling of all chemical containers is another excellent control measure to chemical hazards. Container labels give the name of the chemical in the container, the name/address of the manufacturer and a hazard warning statement and/or graphic hazard statement that warns you of possible dangers. Read the label on all materials with which you work.

Examples of hazard warning statements:

- Danger, will cause death if swallowed
- Warning, causes eye irritation, harmful if swallowed
- Caution, avoid contact with skin and avoid breathing of vapors

Labels and their warnings should be taken seriously since they provide you with the first clue to the hazards posed to your health and safety. They also give information on personal protective equipment required, emergency response and first-aid steps in case of an exposure, proper procedures in case of a spill and emergency phone numbers.

MSDS

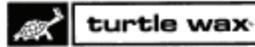
Material safety data sheets, if read and followed, are a powerful means of controlling chemical exposures. Chemical manufacturers are required to provide MSDSs for the chemicals they produce or import. The purpose of the MSDS is to communicate information on the recommended safe use and handling procedures for that chemical.

MSDS may look different, yet the Occupational Safety and Health Administration (OSHA) requires that all MSDS must provide certain categories of information about the chemical substance or mixture:

- Material identification (physical and chemical)
- Hazardous ingredients
- Emergency and first aid procedures
- Recommended control measures
- Physical and health hazards
- Safe handling procedures
- Date of preparation/revision
- Manufacturer's name, address, and phone number
- Primary routes of entry
- National Toxicological Program (NTP) or Annual Report on Carcinogens from the International Agency for Research on Cancer

MATERIAL SAFETY DATA SHEETS
THEY ANSWER YOUR QUESTIONS ABOUT THE CHEMICALS YOU WORK WITH

What product/chemical is this MSDS for?



NFPA RATING
 HEALTH = 1
 FLAMMABILITY = 2
 REACTIVITY = 0

Material Safety Data Sheet
 May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
 Occupational Safety and Health Administration
 (Non-Mandatory Form)
 Form Approved
 OMB No. 1218-0072 T-525

Note: Blank spaces are not permitted, if any item is not applicable, or no information is available, the space must be marked to indicate that.

IDENTITY (As Used on Label and List)
BUG & TAR REMOVER LIQUID, T-525

Section I	
Manufacturer's Name TURTLE WAX, INC.	Emergency Telephone Number NA
Address 5655 WEST 73RD STREET	Telephone Number for information (708) 563-3600
CHICAGO, IL 60638	Date Prepared 7/1/90
	Signature of Preparer (optional)

How much of this material can I be safely exposed to?

What Chemicals are contained in this material?

Section II - Hazardous Ingredients/Identity Information				
Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits (Recommended)	% (optional)
PETROLEUM DISTILLATES (CAS #64475-85-0)	5 MG/M ³	5 MG/M ³	NA	15.0%
PETROLEUM DISTILLATES (CAS #92045-37-9)	5 MG/M ³	5 MG/M ³	NA	10.0%
MONOCYCLIC TERPENES (CAS #8006-64-2)	100 PPM	100 PPM	NA	7.0%

How do I recognize this material? Things to know for storage and

Section III - Physical/Chemical Characteristics					
Boiling Point	NA	Vapor Pressure (mm.Hg.)	NA	Vapor Density (AIR = 1)	NA
Specific Gravity (H ₂ O = 1)	0.932	Melting Point	NA	Evaporation Rate (Butyl Acetate = 1)	NA
Solubility in Water	40%	Appearance and Odor			WHITE WATERY EMULSION. ODOOR: SOLVENT.

What should I do to prevent this material from catching fire? How do I put it out?

Section IV - Fire and Explosion Hazard Data					
Flash Point (Method Used)	110°F TCC	Flammable Limits	NA	LDNA	UEL NA
Extinguishing Media	CARBON DIOXIDE, CHEMICAL FOAMS, WATER SPRAY				
Special Fire Fighting Procedures	NA				
Unusual Fire and Explosion Hazards	NA				

Are there conditions or materials that should not come in contact with the product?

Section V - Reactivity Data		
Stability	Unstable	Conditions to Avoid
	Stable	X NA
Incompatibility (Materials to Avoid)		NA
Hazardous Decomposition or Byproducts		NA
Hazardous Polymerization	May Occur	Conditions to Avoid
	Will Not Occur	X NA

(Reproduce locally)

OSHA 174, Sept. 1985



HAZARD COMMUNICATION TRAINING QUESTIONS

NAME: _____ LOCATION: _____

1. Container labels must:
 - A. Give directions to the manufacturing plant.
 - B. Give price of the product.
 - C. Notify the user of the physical and health hazards.
 - D. Provide translation in Spanish.

2. What is a MSDS?
 - A. Main Statistical Data Service.
 - B. Material Safety Data Sheet.
 - C. New accident reporting system.
 - D. Both A and C.

3. What are the requirements of the Hazard Communication Standard?
 - A. Chemical inventories.
 - B. Container labeling.
 - C. Negotiations for purchase price of chemicals.
 - D. MSDSs.
 - E. Employee Training.
 - F. All of the above except C.

4. What is one way to determine if a chemical has been spilled or released in your work area?
 - A. When you smell something out of the ordinary.
 - B. By reading the MSDS and being knowledgeable of the chemical appearance and odor.
 - C. Call somebody.
 - D. Both A & B.

5. How can you protect yourself from chemical exposures?
 - A. Personal protective equipment and proper work practices.
 - B. Stay upwind of vapors and gases.
 - C. Use proper ventilation.
 - D. All of the above.

6. What are the main examples of chemicals found on site?
 - A. Solvent, fuel, metals, lubricants, gases.
 - B. Toxic, flammable, corrosive, reactive, pressurized.
 - C. Physical properties and health effects.
 - D. The good, the bad and the ugly.

7. New and transferred employees must be trained on the hazards of their new work area.
 - A. True
 - B. False

8. A MSDS provides what?
 - A. Supervisor guide to acid unloading.
 - B. Engineering data.
 - C. Health, safety and first-aid information.
 - D. Chemical process checklist.

9. Where is your site-specific Hazard Communication program located?
 - A. Accident Prevention Manual.
 - B. Employee Handbook.
 - C. Budget Manual.
 - D. MSDS Book.

10. A new chemical used in your area is always considered a new hazard.
 - A. True
 - B. False

11. If a MSDS is not available for the chemical you are using, you should?
 - A. Notify your supervisor.
 - B. Call the manufacturer.
 - C. Contact the Safety Department.
 - D. Nothing, most chemicals are safe.
 - E. Both A & C.

12. Labeling systems use words, graphics, geometric shapes, and colors to warn you of any possible danger to your health and safety, and to tell you about safe work practices you need to follow when handling chemicals.
 - A. True
 - B. False

13. A flammable chemical is a liquid with a flashpoint:
 - A. Of 2,000 degrees Fahrenheit
 - B. Below 100 degrees Fahrenheit
 - C. At freezing
 - D. All of the above

14. Using the ANSI labeling system, which represents the most serious hazard?
 - A. Caution
 - B. Warning
 - C. Danger
 - D. Beware

15. Chemicals can enter the body through:
 - A. Breathing them in
 - B. Contact with body openings
 - C. Both A and B
 - D. None of the Above

16. If you are not familiar with a chemical, you should check the Material Safety Data Sheets.
- A. True
 - B. False
17. A primary/original container label for a chemical must include:
- A. The chemical name
 - B. The chemical manufacturers or importer's name and address
 - C. Warnings of its hazardous content
 - D. All of the above
18. A container label should be checked only if you do not know the contents of the container.
- A. True
 - B. False
19. If a label is torn or missing, you should report it right away to the proper personnel at your facility.
- A. True
 - B. False
20. The Hazard Communication Standard is also referred to as the Right to Know Standard.
- A. True
 - B. False
21. A material safety data sheet is required for all hazardous materials in your facility.
- A. True
 - B. False
22. Safe work practices require a complete understanding and respect for the potential hazards.
- A. True
 - B. False
23. The written emergency response plan contains the procedures to take in the event of an emergency.
- A. True
 - B. False

**HAZARD COMMUNICATION TRAINING QUESTIONS
ANSWER SHEET**

1. Container labels must:
 - A. Give directions to the manufacturing plant.
 - B. Give price of the product.
 - C. Notify the user of the physical and health hazards.**
 - D. Provide translation in Spanish.

2. What is a MSDS?
 - A. Main Statistical Data Service.
 - B. Material Safety Data Sheet.**
 - C. New accident reporting system.
 - D. Both A and C.

3. What are the requirements of the Hazard Communication Standard?
 - A. Chemical inventories.
 - B. Container labeling.
 - C. Negotiations for purchase price of chemicals.
 - D. MSDSs.
 - E. Employee Training.
 - F. All of the above except C.**

4. What is one way to determine if a chemical has been spilled or released in your work area?
 - A. When you smell something out of the ordinary.
 - B. By reading the MSDS and being knowledgeable of the chemical appearance and odor.
 - C. Call somebody.
 - D. Both A & B.**

5. How can you protect yourself from chemical exposures?
 - A. Personal protective equipment and proper work practices.
 - B. Stay upwind of vapors and gases.
 - C. Use proper ventilation.
 - D. All of the above.**

6. What are the main examples of chemicals found on site?
 - A. Solvent, fuel, metals, lubricants, gases.**
 - B. Toxic, flammable, corrosive, reactive, pressurized.
 - C. Physical properties and health effects.
 - D. The good, the bad and the ugly.

7. New and transferred employees must be trained on the hazards of their new work area.
 - A. True**
 - B. False

8. A MSDS provides what?
- A. Supervisor guide to acid unloading.
 - B. Engineering data.
 - C. Health, safety and first-aid information.**
 - D. Chemical process checklist.
9. Where is your site-specific Hazard Communication program located?
- A. Accident Prevention Manual
 - B. Employee Handbook
 - C. Budget Manual
 - D. MSDS Book**
10. A new chemical used in your area is always considered a new hazard.
- A. True**
 - B. False
11. If a MSDS is not available for the chemical you are using, you should?
- A. Notify your supervisor.
 - B. Call the manufacturer.
 - C. Contact the Safety Department.
 - D. Nothing, most chemicals are safe.
 - E. Both A & C**
12. Labeling systems use words, graphics, geometric shapes, and colors to warn you of any possible danger to your health and safety, and to tell you about safe work practices you need to follow when handling chemicals.
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- A. **True**
 - B. False
17. A primary/original container label for a chemical must include:
- A. The chemical name
 - B. The chemical manufacturers or importer's name and address
 - C. Warnings of its hazardous content
 - D. **All of the above**
18. A container label should be checked only if you do not know the contents of the container.
- A. True
 - B. **False**
19. If a label is torn or missing, you should report it right away to the proper personnel at your facility.
- A. **True**
 - B. False
20. The Hazard Communication Standard is also referred to as the Right to Know Standard.
- A. **True**
 - B. False
21. A material safety data sheet is required for all hazardous materials in your facility.
- A. **True**
 - B. False
22. Safe work practices require a complete understanding and respect for the potential hazards.
- A. **True**
 - B. False
23. The written emergency response plan contains the procedures to take in the event of an emergency.
- A. **True**
 - B. False

URS SAFETY MANAGEMENT STANDARD 013
EXCAVATION

URS SAFETY MANAGEMENT STANDARD

Excavation

1. Applicability

This standard applies to operations where URS Corporation and subsidiary companies perform trenching and excavation activities, and/or where URS employees are exposed to hazards associated with trenching and excavation activities.

2. Purpose and Scope

The purpose of this standard is to protect personnel from the hazards associated with excavation and trenching activities.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Competent Person

Where potential employee exposure to hazards associated with the excavation (e.g., entrapment, falls greater than 4 feet (1.2 meters), cave-ins, etc.) can reasonably be anticipated, an excavation-competent person must be on site. The excavation-competent person:

1. Has formal documentation of training as an excavation-competent person.
2. Must be physically located at the excavation site at all times while work is in progress.
3. Is responsible for conducting daily inspections of excavations, adjacent areas, and protective systems prior to each shift.
4. Is responsible for inspection after every rainstorm or other potentially hazard-producing event.
5. Must have knowledge of soils and soil classification.
6. Understands design and use of protective systems.
7. Understands the requirements of the applicable regulations.

URS SAFETY MANAGEMENT STANDARD

Excavation

8. Has authority to stop work and take corrective actions when conditions change.
9. Has the ability to recognize and test hazardous atmospheres.
10. If URS hires a subcontractor to perform excavation or trenching activities, the subcontractor will be required to assign an excavation-competent person to the project. Documentation of this person's qualifications will be maintained in the project safety file.

B. Preliminary Planning

1. Underground and aboveground utilities, adjacent structures or retaining walls, spoil layout, truck routes, and emergency procedures must be identified before work begins.
2. When the excavation or trench approaches the estimated location of underground utilities, the exact location will be determined by methods identified in SMS 034 – Utility Clearance and Isolation.

C. Access/Egress

1. Entry into an excavation or trench should not be made unless absolutely necessary.
2. If personnel enter an excavation or trench that is 4 feet (1.2 meters) deep or more, ladders, steps, ramps, or other safe means of access and egress must be provided, and located at intervals of 25 feet (7.6 meters) or less of lateral travel. If a ladder is used, the ladder must extend 3 feet (0.9 meter) above the original surface of the ground.
3. In excavations and trenches that employees may be required to enter, excavated or other material must be effectively stored and retained at least 2 feet (0.6 meter) or more from the edge of the excavation. As an alternative to this clearance requirement, barriers or other effective retaining devices may be used in lieu thereof in order to prevent excavated or other materials from falling into the excavation.
4. Surface crossing of trenches by personnel or vehicles should not be made unless absolutely necessary. When necessary, the following conditions must be met:

URS SAFETY MANAGEMENT STANDARD

Excavation

- a. Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.
 - b. Walkways or bridges must have a minimum clear width of 20 inches (50.8 centimeters [cm]), be equipped with standard guardrails, and extend a minimum of 24 inches (61 cm) past the surface edge of the trench.
5. When performing excavation oversight or observation on an excavation/trench greater than 4 feet (1.2 meters) in depth, personnel must remain at least more than 2 feet (0.6 meter) from the leading edge of the excavation.

D. Soil Classification

When sloping, benching, or installed protective systems are used, soil classification of each rock and soil deposit must be classified by a competent person. Soil and rock will be classified as one of the following: stable rock, Type A soil, Type B soil, or Type C soil. The classification will be based on the results of at least one visual analysis and one manual analysis, such as soil plasticity dry strength, thumb penetration, pocket penetrometer, or hand-operated shear vane. In the event that soil classification requires additional technical expertise, the competent person will consult with a registered professional engineer. (See Supplemental Information A – Soil Classification.)

E. Protective Systems

1. Employees in excavations deeper than 4 feet (1.2 meters) must be protected by means of properly designed protective systems.
2. Protective systems for excavations or trenches deeper than 20 feet (6.1 meters) must be designed and stamped by a registered professional engineer.
3. Protective systems must have the capacity to resist all loads that are intended or could reasonably be expected to be applied or transmitted to the system.
 - a. Sloping and Benching
 - When personnel are required to work in trenches or excavated areas, all slopes must be excavated to at least the angle of repose, or otherwise safely supported to prevent cave-ins.

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Excavation

- The determination of the angle of repose and design of the supporting system must be based on careful evaluation of pertinent factors such as: depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed by structures, equipment, overlying material, or stored material; and vibration from equipment, blasting, traffic, or other sources. (See Supplemental Information B – Angles of Repose – Simple Slopes.)
- The slopes and configurations of sloping and benching systems for excavations 4 feet (1.2 meters) to 20 feet (6.1 meters) deep will be selected and constructed by the employer or his designee, and must be in accordance with the following requirements.
- Soil must be analyzed by a competent person to determine the soil or rock type. The maximum allowable slope for each soil or rock type is identified in the table below.

Soil or Rock Type	Maximum Allowable Slope (Horizontal: Vertical)
Stable Rock	Vertical 90°
Type A	¾:1 or 53°
Type B	1:1 or 45°
Type C	1½: 1 or 34°

- Soil classification is not required if 1½:1 (Horizontal:Vertical) or 34° slope is used. If this slope is greater than 1½:1 (Horizontal:Vertical) or 34°, a soil classification must be made. The excavation must comply with one of the following three options.
 - Option I – Maximum allowable slope, and allowable configurations for sloping and benching systems will be determined in accordance with the conditions and requirements in Supplemental Information A – Soil Classification; and Appendix B – Sloping and Benching.
 - Option II – Designs of sloping or benching systems will be selected by using tabulated data based on soil

URS SAFETY MANAGEMENT STANDARD

Excavation

conditions. These tables must be calculated and prepared by a registered professional engineer. The plan must be stamped by a registered professional engineer, and this information must be documented and filed on site.

- Option III – A registered professional engineer must design the sloping and benching system and stamp the plan. This information must be documented and filed on site.

Excavations with sloping and benching in excess of 20 feet deep must be designed and stamped by a registered professional engineer.

b. Timber and Aluminum Hydraulic Shoring for Trenches

Designs of support systems, shield system, and other protective systems will be selected and constructed by the employer or their designee, and must be in accordance with one of four options.

- Option I – Designs using Appendices A, C, and D (see 29 Code of Federal Regulations [CFR] 1926 Subpart P). Shoring in trenching will be determined using conditions and requirements of Supplemental Information A – Soil Classification; Appendix C – Timber Shoring; and Appendix D – Aluminum Hydraulic Shoring.
- Option II – Designs of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data will be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer (i.e., trench jacks, hydraulic). This information must be filed on site.
- Option III – Designs using other tabulated data. Designs of support systems, shield systems, or other protective systems will be selected from and be in accordance with tabulated data. This information must be filed on site.
- Option IV – Design by registered professional engineer. Support systems, shield systems, and other protective

URS SAFETY MANAGEMENT STANDARD
Excavation

systems not using Option I, II, or III must be approved and stamped by a registered professional engineer.

- c. Alternatives to Timber Shoring
- Portable trench boxes or sliding trench shields may be used for the protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they must be designed, constructed, and maintained in a manner that will provide protection equal to or greater than the sheeting or shoring required for the trench.
 - Trench boxes require placement using portable lifting equipment such as backhoes or other tractor-like devices. The job hazard analysis will consider the hazards of lifting and placement of the trench boxes, including the proper use of chains, stability of the mobile equipment, swing radius protection for load, and load rating for the lifting device.
 - Trench shields and boxes must either be pre-manufactured with listed load ratings, or designed, stamped, and constructed under the direction of a registered professional engineer.
- d. Protective systems designed to protect employees in excavations deeper than 20 feet (6.1 meters) must be designed and stamped by a registered professional engineer.
- e. Excavations must be clearly identified and barricaded to keep unauthorized individuals out.
- f. Walkways, runways, and sidewalks must be kept clear of excavated material or other obstructions, and no sidewalks should be undermined unless shored to carry a minimum live load of one 125 pounds (56.6 kilograms) per square foot.
- g. If it is necessary to place heavy objects or operate heavy equipment on a level above and near any excavation, the side of the excavation must be sheet piled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

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Excavation

F. Hazardous Atmospheres and Confined Spaces

1. In excavations or trenches greater than 4 feet (1.2 meters) deep where an oxygen deficient (<19.5 percent) or flammable (>10 percent Lower Explosive Limit [LEL]) or other potentially toxic environment could be expected to exist, the atmosphere of the excavation must be monitored before workers enter the excavation. Air monitoring must be conducted before personnel enter an excavation or trench, and then periodically to ensure that the atmosphere remains safe. Monitoring will be conducted at a minimum of three vertical depths of the excavation to detect potentially stratified gas layers (e.g., propane has a density 1.55 times that of normal air and will accumulate in the lower depths of an open trench).
2. The frequency of air monitoring will be increased if equipment used in or near the excavation or trench may alter the atmosphere where personnel are working. All air monitoring must be documented and maintained in the project safety files.
3. Attended emergency rescue equipment, such as a breathing apparatus, a safety harness and line, basket stretcher, etc., must be readily available where adverse atmospheric conditions may exist or develop in an excavation or trench.
4. Excavations or trenches may qualify as confined spaces. When this occurs, compliance with SMS 010 – Confined Spaces, is required.

G. Water Accumulation

1. Employees will not work in excavations where water is accumulating unless adequate precautions have been taken to protect employees. Personnel must exit excavations and trenches during rainstorms.
2. De-watering equipment must be installed and monitored by a competent person.
3. Diversion ditches, dikes, or other suitable means will be used to prevent water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation.

URS SAFETY MANAGEMENT STANDARD

Excavation

4. Excavations and trenches must be inspected by a competent person after each rain event and before personnel are permitted to re-enter the excavation or trench.

H. Excavation and Trenching Permit

1. An Excavation/Trenching Permit (Attachment 013-1 NA) must be completed prior to all excavation or trenching activities.
2. The Excavation and Trenching Permit must be completed and signed by all applicable parties as indicated on the permit.
3. Excavation and Trenching Permits may be valid for up to 1 week.

I. Daily Inspections

1. Daily inspections must be made (Attachment 013-2 NA) of excavations and trenches. Where potential employee exposure to hazards associated with the excavation (e.g., entrapment, falls greater than 4 feet (1.2 meters), cave-ins, etc.) can reasonably be anticipated, these inspections must be made by a competent person.
2. Inspections must be conducted daily before the start of work, after every rainstorm, after other events that would increase hazards such as snowstorm, thaw, earthquake, or dramatic change in weather, and when fissures, tension crack, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur.
3. If evidence of possible cave-ins or slides is apparent, all work in the excavation or trench must cease until the necessary precautions have been taken to safeguard the personnel.

J. Excavating at Potential MEX/UXO Sites

1. If the project site is suspected of munitions and explosives of concern (MEC) or unexploded ordinance (UXO) contamination, the UXO team will conduct a reconnaissance and MEC/UXO avoidance to provide clear access routes to each site before excavation crews enter the area.
2. MEC/UXO sites with planned excavation activities will not be conducted until a complete plan for the site is prepared and/or approved by the URS UXO Safety Officer. MEC/UXO avoidance

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Excavation

must be conducted during excavation operations on known or suspect MEC/UXO sites (SMS 039).

K. Training/Briefings

1. Conduct and document daily safety briefings for all employees associated with excavation activities. Discuss excavation hazards, protective measures, and work practices that will be applicable to the day's activities.

5. Documentation Summary

The following information will be maintained in the project file:

- A. Competent person qualifications.
- B. Excavation and Trenching Permit(s).
- C. Daily inspections by an excavation-competent person.
- D. Air monitoring records.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard [Excavations](#) 29 CFR 1926, Subpart P
 1. Appendix B, [Sloping and Benching](#)
 2. Appendix C, [Timber Shoring](#)
 3. Appendix D, [Aluminum Hydraulic Shoring](#)
 4. Appendix E, [Alternatives to Timber Shoring](#)
- B. U.S. OSHA Technical Links – [Trenching and Excavation](#)
- C. [SMS 010](#) – Confined Space Entry
- D. [SMS 034](#) – Utility Clearance and Isolation
- E. [SMS 039](#) – Munitions Response / Munitions and Explosives of Concern
- F. [Attachment 013-1 NA](#) – Excavation/Trenching Permit
- G. [Attachment 013-2 NA](#) – Daily Excavation/Trench Inspection Form

URS SAFETY MANAGEMENT STANDARD
Excavation

7. Supplemental Information

- A. [Soil Classification](#)
- B. [Angle of Repose – Simple Slopes](#)



EXCAVATION / TRENCHING PERMIT

All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be evacuated immediately, and no one is allowed to re-enter until corrective action has been taken.

Signature and Dates

	Print Name	Signature	Date
Excavation Competent Person	_____	_____	_____
Client Representative (if applicable)	_____	_____	_____
Site Supervisor	_____	_____	_____
HSE Representative	_____	_____	_____
Registered Professional Engineer (if applicable)	_____	_____	_____
Project Manager	_____	_____	_____
Subcontractor Rep	_____	_____	_____
Equipment Superintendent	_____	_____	_____
Field Engineer	_____	_____	_____
Other	_____	_____	_____



Health, Safety and Environment
DAILY EXCAVATION / TRENCH
INSPECTION FORM

Attachment 013-2 NA

Issue Date: July 2000
Revision 5: December 2009

Competent Person: _____

Date: _____

Project Name: _____

Weather Conditions: _____

Excavation Location: _____

Rainfall Amounts 24 Hours Previous: _____

Access/Egress

Is access and egress located within 25 feet (7.6 meters) of entrants? Yes No Not Applicable

If ladders are used, do they extend 3 feet (0.9 meter) beyond the top of the excavation? Yes No Not Applicable

Soil Characteristics

Is any water seepage noted in trench walls or bottom? Yes No Not Applicable

Are pumps in place, or available if needed? Yes No Not Applicable

Is there evidence of significant fracture planes in soil or rock? Yes No Not Applicable

Are there any zones of unusually weak soils or materials not anticipated? Yes No Not Applicable

Have tension cracks been observed along the top on any slopes? Yes No Not Applicable

Are there any noted dramatic dips or bedrock? Yes No Not Applicable

Is there any evidence of caving or sloughing of soil since the last inspection? Yes No Not Applicable

Protective Systems

Are slopes cut at design angle of repose? Yes No Not Applicable

Is the shoring system installed in accordance with the design? Yes No Not Applicable

Is the shoring being used secure? Yes No Not Applicable

Does the design include an adequate safety factor for equipment being used? Yes No Not Applicable

Is traffic being adequately kept away from the excavation/trenching operation? Yes No Not Applicable

Are hydraulic shores pumped to design pressure? Yes No Not Applicable

Is vibration from equipment or traffic too close to the trenching operation? Yes No Not Applicable

Are trench box(s) certified? Yes No Not Applicable

Hazardous Atmosphere & Confined Spaces

Is the hazardous atmosphere testing being conducted on a regular basis? Yes No Not Applicable

Have rescue procedures been established, and is equipment immediately available? Yes No Not Applicable



Health, Safety and Environment
DAILY EXCAVATION / TRENCH
INSPECTION FORM

Attachment 013-2 NA

Issue Date: July 2000
Revision 5: December 2009

Miscellaneous

- Are utility markings in place? Yes No Not Applicable
- Are trees, boulders, or other hazards located in the area? Yes No Not Applicable
- Are barricades or covers in place and in good condition? Yes No Not Applicable
- Is excavated material and equipment at least 2 feet (0.6 meter) from the edge of the excavation? Yes No Not Applicable
- Are all short-term trench(es) covered within 24 hours? Yes No Not Applicable
- Are GFCIs used on all temporary electrical cords? Yes No Not Applicable
- Is the excavation within the original scope of the excavation permit? Yes No Not Applicable
- Is a valid excavation permit executed for the excavation/trenching activity? Yes No Not Applicable

Notes:

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"I hereby attest that the following conditions existed and that the following items were checked or reviewed during this inspection."

All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be immediately evacuated, and no one is allowed to re-enter until corrective action has been taken.

Daily Excavation/Trenching Inspection Completed By:

COMPETENT PERSON

Date

SOIL CLASSIFICATION**"Type A" soils**

Cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A.

However, no soil is Type A if:

1. The soil is fissured;
2. The soil is subject to vibration from heavy traffic, pile driving, or similar effects;
3. The soil has been previously disturbed;
4. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
5. The material is subject to other factors that would require it to be classified as a less stable material.

"Type B" soils

1. Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
2. Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
3. Previously disturbed soils except those which would otherwise be classed as Type C soil.
 - a. Soil that Dry rock that is not stable; or
 - b. Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

"Type C" soils

1. Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
2. Granular soils including gravel, sand, and loamy sand;
3. Submerged soil or soil from which water is freely seeping;
4. Submerged rock that is not stable, or
5. Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.



SOIL CLASSIFICATION

Soil Texture	Visual detection of particle size and general appearance of the soil	Squeezed in hand and pressure released		Soil ribboned between thumb and finger when moist.
		When Air Dry	When Moist	
Sand	Soil has a granular appearance in which the individual grain sizes can be detected. It is free flowing when in a dry condition.	Will not form a cast and will fall apart when pressure is released.	Forms a cast, which will crumble when lightly touched.	Cannot be ribboned.
Sandy Loam	Essentially a granular soil with sufficient silt and clay to make it somewhat coherent. Sand characteristics predominate.	Forms a cast, which readily falls apart when lightly touched.	Forms a cast, which will bear careful handling without breaking.	Cannot be ribboned.
Loam	A uniform mixture of sand, silt and clay. Grading of sand fraction quite uniform from coarse to fine. It is mellow, has somewhat gritty feel, and yet is smooth and slightly plastic.	Forms a cast, which will bear careful handling without breaking.	Forms a cast, which can be handled freely without breaking.	Cannot be ribboned.
Silt Loam	Contains a moderate amount of the finer grades of sand and only a small amount of clay over half of the particles are silt. When dry it may appear quite cloddy which readily can be broken and pulverized to a powder.	Forms a cast, which can be freely handled. Pulverized it has a soft flour-like feel.	Forms a cast, which can be freely handled. When wet, soil runs together and puddles.	It will not ribbon but it has a broken appearance, feels smooth and may be slightly plastic.
Silt	Contains over 80% of silt particles with very little fine sand and clay. When dry, it may be cloddy, readily pulverizes to powder with a soft flour-like feel.	Forms a cast, which can be handled without breaking.	Forms a cast, which can be freely handled. When wet, it readily puddles.	It has a tendency to ribbon with a broken appearance, feels smooth.
Clay Loam	Fine textured soil breaks into hard lumps when dry. Contains more clay than silt loam. Resembles clay in a dry condition; identification is made on physical behavior of moist soil.	Forms a cast which can be handled freely without breaking.	Forms a cast, which can be handled freely without breaking. It can be worked into a dense mass.	Forms a thin ribbon, which readily breaks, barely sustaining its own weight.
Clay	Fine textured soil breaks into very hard lumps when dry. Difficult to pulverize into a soft flour-like powder when dry. Identification based on cohesive properties of the moist soil.	Forms a cast which can be freely handled without breaking.	Forms a cast, which can be handled freely without breaking.	Forms long, thin flexible ribbons. Can be worked into a dense, compact mass. Considerable plasticity.
Organic Soils	Identification based on the high organic content. Muck consists of thoroughly decomposed organic material with considerable amount of mineral soil finely divided with some fibrous remains. When considerable fibrous material is present, it may be classified as peat. The plant remains or sometimes the woody structure can easily be recognized. Soil color ranges from brown to black. They occur in lowlands. In swamps or swales. They have high shrinkage upon drying. Table 1. –Field Method for identification of soil texture			

ANGLE OF REPOSE

FOR SLOPING OF SIDES OF EXCAVATIONS LESS THAN 20 FEET DEEP

Note: Clays, Silts, Loams
or Non-Homogenous
Soils Require Shoring
or Bracing

The Presence of
Ground Water Requires
Special Treatment

Examples*

Type A Soils:

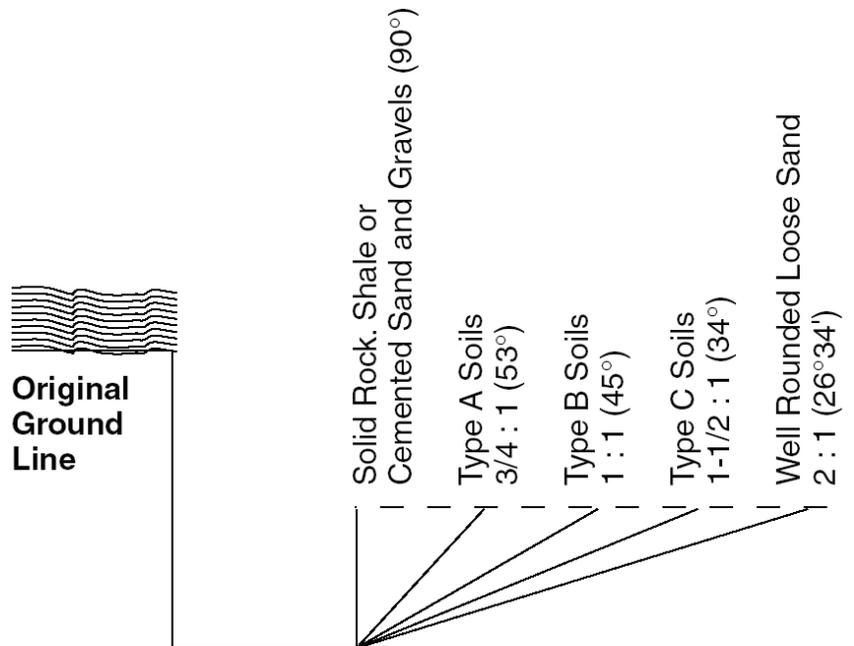
Clay, silt clay, sandy clay
clay loam, caliches,
and hardpan

Type B Soils:

Angular gravel, silt,
silt loam, sandy loam,
unstable dry rock

Type C Soils:

Gravel, sand and loamy
sand, submerged
soil and rock, and
layered soils



REFERENCE:

OSHA Safety and Health Standards 1926
Appendix A and B to Subpart P

**URS SAFETY MANAGEMENT STANDARD 014
FIRE PROTECTION AND PREVENTION**

URS SAFETY MANAGEMENT STANDARD

Fire Protection and Prevention

1. Applicability

This standard applies to URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to reduce/eliminate potential fire hazards in the workplace and to provide for a rapid, effective response should a fire occur.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location. At project sites controlled by contractors or building owners, some of these responsibilities may be covered by building/facility owners or owner agents.

4. Requirements

A. Fire Protection

1. A fire protection program will be developed and followed throughout all phases of work.
 - a. Access to available firefighting equipment will be maintained at all times.
 - b. Firefighting equipment will be inspected monthly and maintained in operating condition. Defective equipment will be immediately replaced.
 - c. Fire extinguishers that out of service or discharged will be immediately tagged, removed from service, and replaced.
 - d. Firefighting equipment will be conspicuously located and not obstructed from view in the workplace.
 - e. Where and when required or necessary, the project manager will provide a trained and equipped firefighting organization (fire brigade) to assure adequate protection.
2. A temporary or permanent water supply (sufficient volume, duration, and pressure) required to properly operate the firefighting equipment will be made available as soon as combustible materials accumulate.

URS SAFETY MANAGEMENT STANDARD
Fire Protection and Prevention

- a. Where underground water mains are to be provided, they will be installed, completed, and made available for use as soon as practicable.
- b. Fire Hose and Connections
 - i. One hundred feet, or less, of 1.5-inch (3.75-cm) hose, with a nozzle capable of discharging water at 25 gallons (95 liters) or more per minute, may be substituted for a fire extinguisher rated not more than 2A 20BC in the designated area, provided the hose line can reach all points in the area.
 - ii. If fire hose connections are not compatible with local firefighting equipment, the project manager will provide adapters or equivalent to permit connections.
 - iii. During demolition involving combustible materials, charged hose lines supplied by hydrants, water trucks with pumps, or equivalent will be made available.
- c. Fixed Firefighting Equipment
 - i. Sprinkler Protection
 - Where URS is involved in the construction of a facility in which automatic sprinkler protection is required, the installation of the sprinklers will closely follow the construction, and sprinklers will be placed into service as soon as practicable.
 - Where URS is involved in the demolition or alteration of a facility, existing automatic sprinkler installations should be retained in service as long as reasonable. Only authorized persons will permit the operation of sprinkler control valves. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves will be checked daily, at the close of work/business, to ascertain that the protection is in service.

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ii. Standpipes

In all structures requiring standpipes or where standpipes exist in structures being altered, they will be maintained to always be ready for fire protection use. Conspicuously marked standpipes will be provided with connections on the outside of the structure (at the street level). Each floor will be equipped with at least one standard hose outlet.

iii. Fire Alarm Devices

- An alarm system (e.g., telephone system, siren) will be established to alert both the employees on the site and the local fire department of an emergency.
- The alarm code and reporting instructions will be conspicuously posted at phones and at all employee entrances.

iv. Fire Cutoffs

- In new construction, firewalls and exit stairways required for the completed buildings will be given construction priority. Fire doors, with automatic closing devices, will be hung on openings as soon as practicable.
- Fire cutoffs will be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

d. Jobsite Requirements

- i. Material storage areas will be equipped with fire extinguishers adequate for their size, construction, and the material stored therein.
- ii. Welding, cutting, grinding, and burning will not be done within 25 feet (7.6 meters) of any material fuel storage area. Fire extinguishers will be provided at the site of welding operations.

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Fire Protection and Prevention

- iii. Flammable materials will be stored as far as possible from the working area, at least 25 feet (7.6 meters). Safety cans will be used when handling and transporting fuel, gas, and other flammables.
- iv. Extinguishers are to be adequately maintained.
- v. The telephone number of the nearest organized firefighting group is to be displayed at jobsite telephones.

3. Fire Extinguishing Equipment

a. Extinguisher Requirements

Use only UL-listed extinguishers. Mark extinguishers and extinguisher locations, indicating the suitability of each extinguisher for a particular classification of fire.

b. Building and Occupancy Hazard Protection

Requirements for fire extinguisher protection are divided into two categories: building protection and occupancy hazard protection. Provide for extinguishing equipment to protect both the building structure (if it is combustible) and the occupancy hazards inside it.

- i. For building protection, provide fire extinguishers rated for Class A fires or greater, as required by applicable building codes.
- ii. For protection against occupancy hazards, provide fire extinguishers rated for Class A, B, C, or other fire potential as appropriate. Requirements may vary from section to section within a single building. Determine the occupancy hazards, as well as the proper ratings of necessary fire extinguishers, of each room or section. Classify rooms or sections as light hazard, ordinary hazard, or extra hazard. See Supplemental Information B for additional details and assistance in determining extinguisher requirements.

c. Extinguisher Placement

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Fire Protection and Prevention

- i. Place extinguishers in conspicuous locations, along normal paths of travel, and near exits. If the extinguishers are not readily visible, use wall markings, signs, or lights to identify their locations.
- ii. Ensure that extinguishers are readily accessible. Keep the space in front of and below extinguishers clear at all times. The floor area beneath extinguishers may be marked as a reminder to keep the area clear.
- iii. Hang extinguishers on hangers, brackets, or other equipment furnished by the manufacturer, or place them on shelves. If an extinguisher weighs less than 40 pounds (18.1 kg), the top of the extinguisher will not be more than 5 feet (1.5 meters) above the floor. If an extinguisher weighs equal to or more than 40 pounds (18.1 kg), it will not be more than 3.5 feet (1.1 meters) above the floor. The clearance between the bottom of the extinguisher and the floor will never be less than 4 inches (10.2 cm).
- iv. Provide the appropriate number and types of fire extinguishers for operations being performed. Refer to Supplemental Information A for guidance.

d. Inspection

Properly trained personnel will inspect extinguishers at least monthly. The monthly inspection will include the following items at a minimum:

- i. Location.
- ii. Rating.
- iii. Access.
- iv. Visibility.
- v. Operating instructions.
- vi. Seals.
- vii. Tamper indicators.

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viii. Fullness.

ix. Physical condition.

Attach inspection tags to each extinguisher indicating the dates of purchase, inspection, testing, and recharging, and the initials of the inspector. In addition to the tag, a colored tape may be used to indicate that an extinguisher has been inspected.

Fire extinguishers must be inspected annually by a qualified fire services contactor.

e. Testing and Maintenance

- i. Establish periodic testing programs to ensure that extinguishers are in proper operating condition. Only properly trained personnel (preferably fire extinguisher vendors) should maintain extinguishers.
- ii. At the conclusion of testing or maintenance work, attach a tag to the extinguisher showing the date and the signature of the person who performed the service.

f. Testing Intervals

- i. Each year, recharge soda acid and foam extinguishers, and weigh others according to the manufacturer's instructions. Inspect the body, hose, and nozzle of the extinguisher, and examine the dry powder. Note: Testing is not necessary for stored pressure units unless a loss of pressure or other conditions indicates a need; however, units mounted in vehicles or otherwise subject to mechanical packing should have their powder examined.
- ii. Every five years, test the pressure parts of all extinguishers except Halon 1301 extinguishers; dry chemical extinguishers with braised-brass, mild steel, or aluminum shells; and dry-powder extinguishers for metal fires.

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- iii. Every six years, empty dry-chemical, stored-pressure extinguishers and examine working parts for operability.
- iv. Every 12 years, test the pressure parts of Halon 1301 extinguishers; dry-chemical extinguishers with braised-brass, mild steel, and aluminum shells; and dry-powder extinguishers for metal fires.

g. Employee Training

- i. Where fire extinguishers are provided for employee use, training will be provided on general principles of portable fire extinguishers, including stages of fires and classes of fire extinguisher. The emphasis should be on hazards of fighting a fire during the initial phases of a fire.
- ii. Personnel designated to use firefighting as part of a site Emergency Action Plan must have training in the use of appropriate equipment. Training must be conducted prior to initial assignment and annually thereafter or whenever there is a change in the Emergency Action Plan or new equipment is introduced.

B. Fire Prevention

1. General

- a. Develop an Emergency Preparedness Plan as outlined in SMS 003 – Emergency Preparedness Plan.
- b. Conduct evacuation drills at least annually.
- c. Maintain good housekeeping to reduce fire hazards and to provide safe routes of egress should a fire occur.
- d. Conduct periodic workplace inspections to identify fire hazards such as unnecessary accumulation of combustibles (including paper and boxes), unnecessary storage of flammables, and sources of ignition.

2. Ignition Hazards

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Fire Protection and Prevention

- a. Electrical wiring and equipment for light, heat, or power purposes will be properly installed.
 - b. Equipment powered by internal combustion will be located with the exhausts positioned away from combustible materials. When the exhausts are piped outside the building under construction, a clearance of at least 6 inches (15 cm) will be maintained between piping and combustible material.
 - c. Smoking is prohibited at or in the vicinity of operations that constitute a fire hazard. Such areas will be conspicuously posted as follows: "NO SMOKING OR OPEN FLAME."
 - d. Portable, battery-powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, will be approved for the hazardous locations. For more information, see SMS 015 – Flammable and Combustible Liquids and Gases.
 - e. The nozzles of air, inert gas, and steam lines or holes used in the cleaning or ventilation of tanks and vessels containing hazardous concentrations of flammable gases or vapors will be bonded to the tank or vessel shell. Bonding devices will not be attached or detached while hazardous concentrations of flammable gases or vapors exist.
3. Temporary Buildings
- a. Temporary buildings will not be erected where the location adversely affects any means of employee exit.
 - b. Temporary buildings, located within another building or structure, will be of noncombustible construction or combustible construction having a fire resistance rating of not less than 1 hour.
 - c. Temporary buildings, located other than inside another building and not used for handling and storage of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, will be located at a distance of not less than 10 feet (3 meters) from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet (186 square meters) in total, will be considered a single temporary building.

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4. Open Yard Storage

- a. Combustible materials will be stored with regard to the stability of piles and in no case higher than 10 feet (3 meters).
- b. Driveways between and around combustible storage piles will be at least 15 feet (4.6 meters) wide and maintained free of accumulations of rubbish, equipment, or other articles or materials. Driveways will be spaced to produce a maximum grid system unit of 50 feet (15.2 meters) by 150 feet (45.7 meters).
- c. The entire storage site will be kept free from accumulations of unnecessary combustible materials. Weeds and grass will be maintained, and procedures will be established for periodic cleanup of the entire area.
- d. The method of piling combustible materials will be solid and in orderly regular piles. No combustible material will be stored outdoors within 10 feet (3 meters) of a building or structure.
- e. Portable fire extinguishing equipment, suitable for the fire hazard involved, will be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A:20BC, will be placed to assure that the maximum travel distance to the nearest unit will not exceed 100 feet (30.5 meters).

5. Indoor Storage

- a. Storage will not obstruct, or adversely affect, means of exit.
- b. Materials will be stored, handled, and piled with regard to their fire characteristics.
- c. Noncompatible materials, which may create a fire hazard, will be segregated by a barrier having a fire resistance of at least 1 hour.
- d. Materials will be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling will be maintained at all times. Aisle space will be

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maintained to safely accommodate the widest vehicle used within the building for firefighting purposes.

- e. A clearance of at least 36 inches (90 cm) will be maintained between the top level of the stored material and the sprinkler deflectors.
- f. Clearance will be maintained around lights and heating units to prevent ignition of combustible materials.
- g. A clearance of 24 inches (60 cm) will be maintained around the fire door's path of travel, unless a barricade is provided, in which case no clearance is needed. Material will not be stored within 36 inches (90 cm) of a fire door.

C. Temporary Heating Devices

1. Ventilation

- a. Fresh air will be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means of fresh air supply are inadequate, mechanical ventilation will be provided.
- b. Heaters used in confined spaces necessitate that special care be taken to provide sufficient ventilation to ensure proper combustion, maintain the health and safety of workmen, and limit temperature increase in the area.

2. Clearance and Mounting

- a. Temporary heating devices will be installed to provide clearance to combustible materials not less than the amount shown in the following table:

Minimum Clearance in inches (cm)			
Heating Appliance	Sides	Rear	Chimney Connector
Room heater, circulating type	12 (30)	12 (30)	18 (45)
Room heater, radiant type	36 (90)	36 (90)	18 (45)

- b. Temporary heating devices that are listed for installation with lesser clearance than specified in the previous table must be

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installed in accordance with the manufacturer's specifications.

- c. Heaters not suitable for use on wood floors will not be set directly upon them or other combustible materials. When such heaters are used, they will rest on suitable heat-insulating material or concrete at least 1 inch (2.5 cm) thick or equivalent. The insulating material will extend beyond the heater 2 feet (60 cm) or more in all directions.
- d. Heaters used near combustible tarpaulins, canvas, or similar coverings will be located at least 10 feet (3 meters) from the coverings. The coverings will be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

3. Stability

When in use, heaters will be set horizontally level, unless otherwise permitted by the manufacturer's instructions.

4. Solid Fuel Heaters

Solid fuel heaters are prohibited in buildings and on scaffolds.

5. Oil Fired Heaters

- a. Flammable liquid-fired heaters will be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed will not be considered a primary safety control.
- b. Heaters designed for barometric or gravity oil feed will be used only with integral tanks.
- c. Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Emergency Action Plans.

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Fire Protection and Prevention

- B. Fire extinguisher inspection logs.
- C. Employee training documentation.
- D. Site audits.
- E. Evacuation drills.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard – [Means of Egress](#) – 29 Code of Federal Regulations (CFR) 1910, Subpart E
- B. U.S. OSHA Standard – [Exit Routes, Emergency Action Plans, and Fire Prevention Plans](#) – 29 CFR 1910.38
- C. U.S. OSHA Standard – [Fire Protection](#) – 29 CFR 1910, Subpart L
- D. U.S. OSHA Software – [Fire Safety Advisor](#)
- E. U.S. OSHA Construction Standard – [Fire Protection and Prevention](#) – 29 CFR 1926.150, Subpart F
- F. National Fire Protection Association – Standard for Portable Fire Extinguishers – [NFPA 10](#)
- G. International Code Council – [International Fire Code](#)
- H. [SMS 003](#) – Emergency Preparedness Plan
- I. [SMS 015](#) – Flammable and Combustible Liquids and Gases

7. Supplemental Information

- A. [Fire Classifications](#)
- B. [General Fire Extinguisher Requirements](#)

	<p style="text-align: center;">Health, Safety and Environment</p> <p style="text-align: center;">FIRE CLASSIFICATIONS</p>	<p style="text-align: right;">SMS 014 NA Supplemental Information A Issue Date: February 2009</p>
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A. Fire Classifications

Fires are classified as Class A, B, C, D, or Special, depending upon the types of materials involved. These classifications are defined as follows:

1. Class A – Fires in ordinary combustible materials such as wood, cloth, paper, trash, rubber, and plastic.
2. Class B – Fires in flammable liquid, oil, grease, tar, oil-base paint, lacquer, and flammable gas.
3. Class C – Fires involving energized electrical equipment or systems, resulting in the extinguishing media conducting electricity. When electrical equipment or systems are de-energized, extinguishers for Class A or B fires can be used safely.
4. Class D - Fires involving combustible metals such as magnesium, titanium, zirconium, lithium, potassium, and sodium. Specialized techniques, extinguishing agents, and extinguishing equipment have been developed to control and extinguish fires of this type. Generally, do not use normal extinguishing agents on metal fires. In such fires, there is the danger of increasing the intensity of the fire because of a chemical reaction between some extinguishing agents and the burning metal.
5. Special - Fires that involve certain combustible metals or reactive chemicals require, in some cases, special extinguishing agents or techniques.

B. Extinguisher Classifications and Ratings

All types of extinguishers are not equally effective against all classifications of fires. Therefore, extinguishers are rated according to the classification and size of the fires against which they are effective. Extinguisher ratings are found on the extinguisher label. A rating consists of a letter indicating the classification of fire on which the extinguisher is effective and a rating number indicating the relative extinguishing effectiveness. The significance of the rating number varies with the classification of fire for which the extinguisher is rated. The following rating criteria are used:

1. For extinguishers rated for Class A fires, the rating number indicates relative effectiveness, the higher the number, the more effective the extinguisher. The minimum recommended rating for extinguishers rated for Class A fires is 2A.

	<p style="text-align: center;">Health, Safety and Environment</p> <p style="text-align: center;">FIRE CLASSIFICATIONS</p>	<p style="text-align: right;">SMS 014 NA Supplemental Information A Issue Date: February 2009</p>
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2. For extinguishers rated for Class B fires, the rating number represents the average size (in square feet) of the fire the extinguisher could put out.
3. No number is used for extinguishers rated for Class C fires, because Class C fires are essentially either Class A or B fires involving energized electrical wiring and equipment.

C. Hazard Classifications

The materials in a building or area present hazards of varying potential. These hazards are classified. As follows:

1. Light or Low Hazard – A room or area where, considering the amount of combustible material or flammable liquids present, fires of small size should be anticipated (e.g., change trailers, toilet trailers, and general storage).
2. Ordinary or Moderate Hazard – A location where, considering the amount of combustibles or flammable liquids present, fires of moderate size should be anticipated (e.g., temporary construction offices and most shops).
3. Extra or High Hazard – A location where, considering the amount of combustibles or flammable liquids present, fires of severe magnitude should be anticipated (e.g., carpenter shops and storage areas for flammable liquids and lumber).

1. Fire Extinguishers – General

The following are **minimum** requirements for fire extinguisher placement in office buildings, construction facilities, support buildings, and/or buildings under construction. In some cases, client requirements may be more stringent, in which case the client's requirements supersede the guidelines below.

Extinguisher Requirements for Class A Hazards

Rating Shown on Extinguisher	Maximum Travel Distance to Extinguishers in Feet (m)	Maximum Area to be Protected per Extinguisher		
		Light Hazard sq. ft. (m ²)	Ordinary Hazard sq. ft. (m ²)	Extra Hazard sq. ft. (m ²)
1-A	-	-	-	-
2-A	75 (23)	6,000 (557)	3,000 (279)	-
3-A	75 (22.9)	9,000 (836)	4,500 (418)	3,000 (279)
4-A	75 (22.9)	11,250 (1,045)	6,000 (557)	4,000 (372)
6-A	75 (22.9)	11,250 (1,045)	9,000 (836)	6,000 (557)
10-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	10,000 (929)
20-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	11,250 (1,045)
40-A	75 (22.9)	11,250 (1,045)	11,250 (1,045)	11,250 (1,045)

Extinguisher Requirements for Class B Hazards

Type of Hazard	Minimum Extinguisher Rating	Maximum Travel Distance to Extinguishers in Feet (m)
Light	5-B	30 (9.1)
	10-B	50 (15.2)
Ordinary	10-B	30 (9.1)
	20-B	50 (15.2)
Extra	40-B	30 (9.1)
	80-B	50 (15.2)

Extinguisher Requirements for Class C Hazards

Class C extinguishers are required wherever energized electrical equipment is located. Since a Class C fire itself is either Class A or Class B (involving ordinary combustible material, flammable liquids, or flammable gases), the extinguishers are sized and located as for a Class A or B hazard.

Types of Extinguishers Approved for Types of Hazards

Class A Hazards	Class B Hazards	Class C Hazards
Cartridge-operated water or antifreeze	Carbon dioxide*	Carbon dioxide
Stored pressure water or antifreeze	Dry chemical	Dry chemical
Wetting Agent Foam	Multipurpose dry chemical (ABC)	Multipurpose dry chemical (ABC)
Loaded stream	Halon 1301	Halon 1301
Multipurpose dry chemical (ABC)	Halon 1211	Halon 1211
Pump tank water or antifreeze (Halon 1211)		

*Certain sizes are not classified or acceptable to meet requirements.

2. Hot Work

A minimum of one fire extinguisher, rated at least 20BC, must be provided for each hot work location. The extinguisher should be conspicuously positioned no more than 10 feet (3.04 meters) from the hot work. Refer to SMS 020- Hot Work”.

3. Motorized Construction Equipment

At least one portable fire extinguisher, rated at least 20BC, must be provided on each piece of motorized construction equipment.

4. Temporary Construction/Work Trailer

A minimum of one fire extinguisher, rated at a minimum of 2A, must be provided for each temporary construction/work trailer.

**URS SAFETY MANAGEMENT STANDARD 016
HAND TOOLS AND PORTABLE EQUIPMENT**

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

1. Applicability

This standard applies to URS Corporation and its subsidiary companies in which hand tools and/or portable powered equipment, including chain saws; brush cutters, powder-actuated tools, and similar high-hazard implements are used.

2. Purpose and Scope

The purpose of this standard is to provide procedures for the safe use and handling of hand tools and portable powered equipment. SMS 064 – Hand Safety provides additional information on the safe use of hand tools.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site or project location.

4. Requirements

A. General

1. Keep hand and power tools in good repair and use them only for the task for which they were designed. Use tools only in accordance with the manufacturer's recommendations.
2. Remove damaged or defective tools from service. Affix a "Do Not Use" tag (or similar) to the tool until repairs are made or the tool is destroyed.
3. Provide employees using hand tools or portable powered equipment with personal protective equipment (PPE) and train employees in the use of PPE required for the operation being undertaken.
4. Keep surfaces and handles clean and free of excess oil and grease to prevent slipping.
5. Do not carry sharp tools in pockets; this practice may cause puncture wounds.
6. Clean tools and return to a suitable toolbox, room, rack, or other storage area upon completion of a job.
7. Before applying pressure, ensure that wrenches have a good bite.

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Hand Tools and Portable Equipment

- a. Brace yourself by placing your body in the proper position so that that you will not fall in case the tool slips.
 - b. Make sure hands and fingers have sufficient clearance in the event the tool slips.
 - c. Always pull on a wrench, never push.
8. When working with tools overhead, place tools in a holding receptacle or secure when not in use to prevent them from falling.
 9. Do not leave tools in or on passageways, access ways, walkways, ramps, platforms, stairways, or scaffolds where they can create a tripping hazard.
 10. Do not throw tools from place to place or from person to person, or drop tools from heights.
 11. Use nonsparking tools in atmospheres with fire or explosive characteristics.
 12. Inspect all tools prior to start-up or use to identify any defects.
 13. Powered hand tools should not be capable of being locked in the ON position, except as noted elsewhere in this standard.
 14. Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.
 15. Ensure that all portable powered tools designed to accommodate guards are equipped with such when in use.
 16. Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.
 17. Do not use cheater pipes.
 18. Make provisions to prevent machines from automatically restarting upon restoration of power (see SMS 023 – Lockout and Tagout Safety).
 19. Where URS issues tools to its employees, the supervisor is responsible for the safe condition of tools and equipment.

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

20. Where workers furnish their own tools, their tools must conform to the requirements demanded for safety and efficiency. The supervisor has the responsibility to regularly inspect these tools for defects.

B. Electrical Power Tools

1. Electric-power-operated tools will be either of the approved double-insulated type or grounded in accordance with the National Electric Code.
2. The use of the electric cord for hoisting or lowering electric tools is an unsafe practice and will not be permitted.
3. All handheld powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches (5.1 centimeters) in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools will be equipped with a momentary contact ON/OFF control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
4. All other handheld powered tools such as circular saws, chain saws, and percussion tools without positive accessory holding means will be equipped with a constant pressure switch that will shut off the power when the pressure is released (i.e., "dead man" switch).

C. Grinding Tools

1. Inspect work rests and tongue guards for grinders.
 - a. Work rest gaps should not exceed $\frac{1}{8}$ inch (3 mm).
 - b. Tongue guard gaps should not exceed $\frac{1}{4}$ inch (6 mm).
2. Do not adjust work, guards, or tool rests while the grinding wheel is moving.
3. Inspect the grinding wheel for cracks, chips, defects, or excessive wear. Remove from service if any defects are found.
4. Wear goggles when grinding. A clear full face shield may be worn with the goggles.

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5. Do not use the side of a grinding wheel unless the wheel is designed for side grinding.
6. Always stand to the side of the blade, never directly behind it.
7. Use grinding wheels only at their rated speed.
8. Grinding aluminum is prohibited.
9. For operations in the United Kingdom:
 - a. No grinding wheels exceeding 55 mm are to be used.
 - b. All wheels are to be marked with their safe maximum speed.
 - c. Abrasive wheels will be operated only by personnel who have been specifically trained and specified competent by URS.
 - d. Abrasive wheels will be operated only by persons specified as competent, under the abrasive wheel regulations.
 - e. Abrasive wheels must be operated only if the manufacturer's guard is fitted and they are in good working order.

D. Power Saws

1. Require that circular saws are fitted with blade guards.
2. Inspect each day prior to use. Remove damaged, bent, or cracked saw blades from service immediately.
3. Require that table saws are fitted with blade guards and a splitter to prevent the work from squeezing the blade and kicking back on the operator.
4. Require guards that cover the blade to the depth of the teeth on hand-held circular saws. The guard should freely return to the fully closed position when withdrawn from the work surface.

E. Woodworking Machinery

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1. Do not leave woodworking tools running when unattended.
2. Keep the operating table and surrounding area clear of debris.
3. Do not use compressed air to remove dust and chips from woodworking machinery.
4. Locate the ON/OFF switch to prevent accidental start-up. The operator must be able to shut off the machine without leaving the workstation. Safety goggles and kickback aprons should be provided for and worn by operators. Respirators or local exhaust ventilation may also be necessary based on the type of material being cut or sanded.
5. Guard planers and joiners to prevent contact with the blades throughout the full length of the cutting area.
6. Ensure that band saw blades are fully enclosed except at the point of operation.
7. Require that swing cut-off saws have a guard completely covering the upper half of the saw.
8. Require that circular cross-cut and rip saws are provided with a hood guard, splitter, and anti-kickback device. The hood should adjust itself automatically to the thickness of and remain in contact with the material being cut. All circular saws will be provided with a hood guard.
9. Ensure that exposed parts of the saw blade under the table are properly guarded.
10. Equip all swing cutoff and radial saws that are drawn across a table with limit stops to prevent the saw from traveling beyond the edge of the table.
11. Hold the material being cut firmly against a back guide or fence and cut with a single, steady pass.
12. Cut green or wet material slowly and with caution. Check all material being cut for nails, hard knots, etc.
13. Use a push stick when:

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- a. The cutting operation requires the hands of the operator to come close to the blade.
 - b. Small pieces are being machined.
14. When cutting long stock, provide extension tables and a helper to assist the operator.
15. Adjust saw blades so they clear only the top of the cut.
16. Automatic feed devices should be used whenever feasible.
17. When drills are used:
- a. Take care to prevent clothing from being wound around the drill. Wear sleeves buttoned at the wrist or short-sleeved shirts.
 - b. Clamp or hold down material being drilled to prevent spinning with the drill.
 - c. If the bit is long enough to pass through the material, provide against damage and injury.
 - d. Secure magnetic drills with a chain or rope to prevent falling. Label cord connections to prevent unplugging.
18. When sanders are used:
- a. Move sanders away from the body.
 - b. Because dust may create an explosion hazard, guard against open flames and sparks.
- F. Pneumatic Tools and Equipment
1. Require that pneumatic tools have:
- a. Tool retainers to prevent the tool from being ejected from the barrel during use.
 - b. Safety clips, chains, tie wires, or other retaining devices to secure connections between tool/hose/compressor to prevent whipping in case of disconnection or failure.

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2. Do not lay hose in walkways, on ladders, or in any manner that presents a tripping hazard.
3. Never use compressed air to blow dirt from hands, face, or clothing.
4. Do not use compressed air for cleaning purposes unless the pressure is reduced to 30 pounds per square inch (psi) or less. This rule does not apply for concrete form, mill scale, green cutting, and similar cleaning operations. Proper respiratory, hand, eye, and ear protection must be worn.
5. Never raise or lower a tool by the air hose.
6. Shut off the pressure and exhaust from the line before disconnecting the line from any tool or connection.

G. Powder-Actuated Fastener Tools

1. Use powder-actuated tools that comply with the requirements of the American National Standards Institute (ANSI)/American Society of Safety Engineers (ASSE) Standard A10.3 – 2006 – Powder-Actuated Fastening Systems.
2. Assess local and state regulations governing the use of these tools to ensure compliance.
3. Use only individuals who have been trained by a manufacturer's representative and possess the proper license to operate, repair, service, and handle powder-actuated tools.
4. With each tool, the manufacturer or supplier should furnish a detailed instruction manual covering the application, operation, and maintenance of the tool. The manufacturer's recommendation for size of charge, stud unit, or pin, and for specific application must be followed explicitly by the operator.
5. Keep cartridges or shells in the original containers, in separate metal containers, or in the carrying case provided with the tool, and then stored in locked containers. Keep cartridges of varied charges or forces segregated from each other.

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6. Take precaution, as defined by the manufacturer, in the event of a misfire.
7. Provide information from the manufacturer on the safe use, testing, and maintenance of each type of tool in each tool kit.
8. Never use a powder-actuated tool in a flammable or explosive atmosphere.
9. Require the use of goggles or a full face shield as well as safety glasses during operation of powder-actuated tools.
10. Use only tools that are provided with a shield or muzzle guard. This shield or guard should be of a size, design, and material that will effectively confine flying particles and prevent escape of ricocheting studs and pins.
11. Ensure that powder-actuated tools are not able to be fired unless the tool is pressed against the work surface.
12. Always handle powder-actuated tools like firearms, with hands clear of the muzzle and barrel pointed away from all persons, especially when the tool is being closed or assembled after loading.
13. Ensure that the tool is not able to fire if the tool is dropped when loaded.
14. Ensure that firing the tool requires two separate operations, with the firing movement being separate from the motion of bringing the tool to the firing position.
15. Provide signs and barricades when shooting into walls or floors with personnel working on the other side.
16. Never fire into easily pierced or soft substrates or into materials of unknown resistance to piercing. In these situations, there is potential for the fastener to penetrate and pass through, creating a flying projectile hazard. If penetration of these materials is required, the material should be backed with a box of wood or sand at least four inches (10 cm) thick and of adequate area.
17. Do not use powder-actuated tools in reinforced concrete if there is the possibility of striking the rebar.

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18. Do not use powder-actuated tools on cast iron, high carbon, heat treated steel, or armor plate, thin slate, marble, glass, live rock, glazed brick or tile, terra cotta, or other brittle substances, or where the composition is unknown.
19. Do not fire studs closer than three inches (7.5 cm) from the edge or corner when being used on brick or concrete. Do not fire studs closer than ½ inches (1.25 cm) from the edge when being used on steel.
20. Never load and leave a powder-actuated tool unattended. It should be loaded only prior to its intended firing. Use only studs or pins specifically designed for the tool.
21. Test tools each day prior to loading by testing safety devices according to the manufacturer's recommended procedure.
22. Inspect, clean, and store powder-actuated tools in a safe place at the end of each day. No tool will be stored loaded. Store tools with the barrels removed or breech open.
23. At the manufacturer's recommended intervals, the tool will be completely dismantled and carefully inspected for wear on the safety devices by a qualified person familiar with the tool. Worn parts will be replaced before the tool is used again. It is recommended that factory-authorized service representatives be utilized for inspection, repair, and parts replacement, where possible.

H. Chain Saws

1. Approval by the HSE manager is required for all use of chain saws.
2. Inspect the saw prior to each use and periodically during daily use.
3. Never cut above chest height.
4. Require that the idle is correctly adjusted on the chain saw. The chain should not move when the saw is in the idle mode.
5. Start cutting only after a clear escape path has been made.

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6. Shut the saw off when carrying through brush or on slippery surfaces. The saw may be carried no more than 50 feet (15 meters) while idling.
 7. Require applicable protective gear. This will include, but is not limited to:
 - a. Logger's safety hat.
 - b. Safety glasses and face shield.
 - c. Steel-toed boots.
 - d. Protective leggings.
 - e. Hearing protection.
 - f. Work gloves.
 8. Inspect saws to ensure that they are fitted with an inertia break and hand guard.
 9. *Never* operate a chain saw when fatigued.
 10. Do not allow others in the area when chain saws are operated.
 11. Make sure there are no nails, wire, or other imbedded material that can cause flying particles.
 12. Do not operate a chain saw that is damaged or improperly adjusted, or is not completely and securely assembled. Always keep the teeth sharp and the chain tight. Worn chains should be replaced immediately.
 13. Keep all parts of your body away from the saw chain when the engine is running.
 14. For all operations, only personnel specifically trained and certified as competent by URS may operate chain saws.
- I. Hand-Operated Pressure Equipment
1. Direct pressure equipment such as grease guns, and paint and garden sprayers away from the body and other personnel in the area. The person operating any equipment

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such as this, which has a potential for eye injury, must wear protective goggles.

2. The noise produced when using certain types of pressure equipment may require the use of hearing protection.
3. Never allow the nozzle of a pressurized tool to come in contact with any body parts while operating. There is potential for injection of a chemical directly into the user's body, resulting in severe injury or death.

J. Gasoline-Powered Tools

1. Never pour gasoline on hot surfaces.
2. Never fuel around an open flame or while smoking.
3. Shut down the engine before fueling.
4. Provide adequate ventilation when using in enclosed spaces.
5. Use only Underwriters Laboratories (UL) - or FM-approved safety cans to transport flammable liquids. The use of unapproved containers for gasoline is strictly prohibited.
6. Label gasoline containers in compliance with Hazard Communication requirements, indicating the chemical and physical hazards of the product.

K. Inspection

Inspect all hand tools on a regular basis. Immediately remove defective tools from service, and tag or destroy them to prevent further use.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Site briefings regarding tool use.
- B. Records of tools removed from service.
- C. Copies of powder-actuated tool licenses (as applicable).

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D. Tool inspection documentation.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard – [Hand and Portable Power Tools](#) – 29 Code of Federal Regulations (CFR) 1910, Subpart P
- B. U.S. OSHA Standard – [Construction Tools – Hand and Power](#) – 29 CFR 1926, Subpart I
- C. American National Standards Institute ([ANSI](#))/[American Society of Safety Engineers \(ASSE\) Standard A10.3 – 2006](#) – Powder-Actuated Fastening Systems
- D. [National Association of Demolition Contractors](#)
- E. United Kingdom – ['Provision and Use of Work Equipment' Regulations 1998](#)
- F. Australia/New Zealand Standards – Powder-Actuated Handheld Fastening Tools - AS/NZS 1873.1:2003 Australian/New Zealand Standards – [Hand-held Motor-operated Electric Tools – AS/NZS 60745.1:2003](#)
- G. [SMS 023](#) – Lockout and Tagout Safety
- H. [SMS 064](#) – Hand Safety

URS SAFETY MANAGEMENT STANDARD 018
HEAT STRESS

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Heat Stress

1. Applicability

This standard applies to URS Corporation and its subsidiary companies on projects where ambient (not adjusted) temperatures exceed 70 degrees Fahrenheit (°F) (21 degrees Celsius [°C]) for personnel wearing chemical-protective clothing, including impermeable protective clothing such as Tyvek or Saranex coveralls, and 90°F (32°C) for personnel wearing standard permeable work clothes. Permeable clothing refers to clothes of standard cotton or synthetic materials. Note that certain governmental entities require heat stress prevention techniques be implemented at lower temperatures or whenever outdoor work is conducted. Always consult local regulations to determine if more stringent standards apply.

2. Purpose and Scope

The purpose of this standard is to protect project personnel from the effects of heat-related illnesses.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. The project Health and Safety Plan will address heat stress control when temperatures identified in Section 1 of this standard are anticipated.

This standard introduces three different means of monitoring for heat stress conditions: Wet Bulb Globe Temperature (WBGT), Humidex Based Heat Response and Physiological Monitoring. These methods can be used separately or in conjunction. For employees wearing chemical-protective clothing, physiological monitoring (Section D) is the most effective approach, because evaporative cooling capability is limited.

B. Heat stress is influenced by air temperature, radiant heat, and humidity. The WBGT is a useful index of the environmental contribution to heat stress. Because WBGT is only an index of the environment, the contributions of work demands, clothing, and state of acclimatization must also be accounted for, as described in the following steps.

1. Monitor ambient temperatures and conduct heat stress monitoring in accordance with the project Health and Safety Plan. Revise the heat

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stress monitoring and controls if there are any reports of discomfort due to heat stress.

2. Monitor temperatures in each unique environment in which workers perform work (e.g., take WBGT measurements inside truck cabs for truck drivers, and take separate WBGT measurements in the outdoor area where field employees work, etc.). Follow manufacturer’s instructions on proper use of the WBGT.
3. Determine if individual workers are acclimatized or un-acclimatized. Full heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the activity under those heat-stress conditions is discontinued, or when there is a sustained increase in temperatures of 10 °F (5.6 °C) or more, and a noticeable loss occurs after 4 days. A worker can be considered acclimatized for the purpose of this procedure when they have been exposed to the site conditions (including level of activity) for 5 of the last 7 days.
4. Determine the approximate workload of each worker or group of workers. The following examples can be used for comparison:

Table 1
Examples of Activities within Workload Categories

Categories	Example Activities
Resting	Sitting quietly
	Sitting with moderate arm movements
Light	Sitting with moderate arm and leg movements
	Standing with light work at machine or bench while using mostly arms
	Using a table saw
	Standing with light or moderate work at machine or bench and some walking about
Moderate	Scrubbing in a standing position
	Walking about with moderate lifting or pushing
	Walking on level at 6 Km/hr while carrying 3 Kg weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a non-continuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

5. Determine the approximate proportion of work within an hour during a typical shift. Typically, the initial work schedule will be 60 minutes of work

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per hour (100 percent work) with a small break in the morning and afternoon, as appropriate, and a 30-minute lunch break mid-day.

6. Compare the WBGT values measured in 4.B.1 to the screening criteria values in the following table, using the determinations made in 4.B.3 through 4.B.5.

Table 2
SCREENING CRITERIA FOR HEAT STRESS EXPOSURE
(WBGT Values in °F /°C)

Work Cycle (60 min/ hour)	Acclimatized				Unacclimatized			
	Light Work	Mod. Work	Heavy Work	Very Heavy Work	Light Work	Mod. Work	Heavy Work	Very Heavy Work
100% Work	85.1/ 29.5	81.5/ 27.5	78.8/ 26.0	N/A	81.5/ 27.5	77.0/ 25.0	72.5/ 22.5	N/A
75% Work 25% Rest	86.9/ 30.5	83.3/ 28.5	81.5/ 27.5	N/A	84.2/ 29	79.7/ 26.5	76.1/ 24.5	N/A
50% Work 50% Rest	88.7/ 31.5	85.1/ 29.5	83.3/ 28.5	81.5/ 27.5	86/ 30	82.4/ 28	79.7/ 26.5	77/25
25% Work 75% Rest	90.5/ 32.5	87.8/ 31	86/ 30	85.1/ 29.5	87.8/ 31	84.2/ 29	82.4/ 28	79.7/ 26.5

- a. If the measured WBGT is *less than* the table value, there is little risk of excessive exposure to heat stress, and work can continue. Continue to monitor ambient conditions with the WBGT. However, if there are reports of the symptoms of heat-related disorders, then the analysis of little risk should be reconsidered.
- b. If the measured WBGT is *greater than* the table value, institute heat stress controls, including a work-rest cycle, and perform physiological monitoring as described in section D of this standard.
- c. Because of the physiological strain associated with very heavy work among less fit workers regardless of WBGT, values are not provided in Table 1 for continuous work. Physiological monitoring should always be implemented under these conditions.
- d. For workers wearing cloth coveralls (e.g., Nomex fire resistant clothing), add 3.5 to the measured WBGT. For impermeable clothing, such as Tyvek or Saranex, the WBGT procedures cannot be used. For these situations, workers should begin physiological monitoring as soon as the temperature in the work area exceeds 70°F (21°C).

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C. Humidex Based Heat Response

1. The Humidex method is a simplified way of protecting workers from heat stress which is based on the WBGT to estimate heat strain. It is an equivalent scale intended to express the combined effects of warm temperatures and humidity. Humidex is used as a measure of perceived heat that results from the combined effect of excessive humidity and high temperature.
2. This method requires only a local air temperature and relative humidity value. Monitoring must continue throughout the day for changing conditions. Identify a representative location where measurements can be taken. Measurements should be recorded at least hourly when ambient temperatures and 90°F (32°C) for personnel wearing normal permeable work clothes.
3. Specific procedures to complete the Humidex Based Heat Response Plan are included in Attachment 018-1 NA – Humidex Worksheet.

D. Physiological Monitoring

Physiological monitoring provides a means to assess the effectiveness of the heat stress controls (training, hydration, work-rest cycles, etc.) that are in place. Based on the results of physiological monitoring and self-assessment, work-rest cycles can be adjusted to more effectively control heat stress by shortening the work period, or to allow for longer work periods if workers are recovering adequately during rest breaks.

1. Perform physiological monitoring as soon as the employee stops working and begins their break (rest). Perform *physiological monitoring at least every hour*. *Base rest breaks* on the results of the monitoring, workers' self-assessment, and professional judgment.
 - a. Example 1: If the WBGT is 85°F (29.4°C) or less for acclimatized, light-duty workers, they can work 60 minutes per hour (100 percent work), and they need only take their regularly scheduled breaks.
 - b. Example 2: If the WBGT is greater than 85°F (29.4°C) for acclimatized, light-duty workers, physiological monitoring must be performed, and workers' work-rest cycles must be adjusted as described below.
2. Have workers assess themselves and their body's reaction to the heat and work conditions (self-assessment), and report any signs or symptoms of

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heat illness. These can include nausea or dizziness, heat cramps, extreme thirst, or very dark urine.

3. Based on the results of the physiological monitoring and on the workers' self-assessments, the work period may be adjusted as follows:
 - a. The work period may be *increased* (generally, by 5- to 10-minutes intervals, up to a maximum of 4 hours) if the results of the first 2 hours of the physiological monitoring and the workers' self-assessments indicate that workers *are* recovering adequately (see below), and on the judgment of the Health and Safety Technician.
 - b. The work period *must be decreased* if the results of the physiological monitoring and the workers' self-assessment indicate that workers are NOT recovering adequately (see below).
4. Perform physiological monitoring
 - a. The worker or the Health and Safety Technician must measure and record body temperature and pulse rate as described below. Use SMS 018-2 NA – Heat Stress Monitoring Record as a tool.
5. Body Temperature Monitoring
 - a. Monitor body temperature to determine if employees are adequately dissipating heat buildup. Ear probe thermometers which are adjusted to oral temperature (aural temperature) are convenient and the preferred method of measurement. Determine work/rest regimen as follows:
 - i. Measure oral body temperature at the end of the work period. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.
 - ii. If temperature exceeds 99.6°F (37.5°C), shorten the following work period by 1/3 without changing the rest period.
 - iii. If, at the next rest period, temperature still exceeds 99.6°F (37.5°C), the worker should not be allowed to continue work until repeated temperature measurements are in the acceptable range (i.e., less than 99.6°F). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.

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- iv. Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6°F (38.1°C).
 - b. Have employees assess themselves and their body's reaction to the heat and work conditions, and report any signs or symptoms of heat stress, including, but not limited to, feeling nauseous or dizzy, skin rash or skin irritation, muscle cramps, weakness or fatigue, extreme thirst, dizziness, blurred vision, headache, or very dark urine.
- 6. Pulse Rate Monitoring
 - a. Take the radial (wrist) pulse as early as possible in the rest period and determine the worker's heart rate in beats per minute. The heart rate is determined by counting the pulse for ten seconds and multiplying the number by 6 to get the beats per minute. Record this as P1.
 - b. Wait 2 minutes and repeat the pulse measurement. Record this as P2.
 - c. If P1 is greater than or equal to 110 beats per minute (bpm) and if (P1 – P2) is less than or equal to 10 bpm (indicating that workers are not recovering adequately), shorten the next work cycle by 1/3 without changing the rest period.
 - d. At the next rest period, if P1 is still equal to or greater than 110 bpm, and if (P1 – P2) is still less than or equal to 10 bpm, shorten the following work cycle by 1/3 without changing the rest period.
 - e. At the third rest period, if P1 is still equal to or greater than 110 bpm and (P1 – P2) is still less than or equal to 10 bpm, the worker should not be allowed to continue work until repeated pulse measurements are in the acceptable range (i.e., P1 is less than 110 bpm and (P1 – P2) is greater than 10 bpm). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.
- E. Record monitoring results and worker's self-assessments on Attachment 018-2 NA – Heat Stress Monitoring Record.
- F. Investigate the use of auxiliary cooling devices in extreme heat conditions.
- G. Conduct briefings for employees regarding health hazards and control measures associated with heat stress whenever conditions require the implementation of heat stress monitoring. Review the information provided in Supplemental Information A.

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- H. Provide cool water and electrolyte replacement drinks as described in Supplemental Information A.
- I. Allow employees who are not accustomed to working in hot environments appropriate time for acclimatization, as described in Supplemental Information A.
- J. Provide break areas as described in Supplemental Information A.

5. Documentation Summary

The following information will be maintained in the project file:

- A. Heat Stress Monitoring Records
- B. Employee Safety Briefing Verification Forms

6. Resources

- A. NIOSH – [Working in Hot Environments \(Publication No. 86-112\)](#), 1986
- B. NIOSH – Criteria for a Recommended Standard for Occupational Exposures to Hot Environments ([Publication No. 86-113](#)), 1986
- C. ACGIH – [Documentation of the Threshold Limit Values and Biological Indices, 2003](#)
- D. AFL-CIO Building Trades Division – [Heat Stress in Construction](#)
- E. Occupational Health Clinics for Ontario Worker, Inc. – [Humidex Based Heat Response Plan](#)
- F. [Attachment 018-1 NA](#) – Humidex Worksheet
- G. [Attachment 018-2 NA](#) – Heat Stress Monitoring Record

7. Supplemental Information

- A. [Heat Stress Informational Supplement](#)



HUMIDEX WORKSHEET

Step 1: On the Humidex table below, look up the temperature on the left (Celsius is located below RH>) and the relative humidity (RH) on the top. Determine the Humidex value.

F	RH>	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	
108	42													55	52	50	48	46	
106	41													55	53	51	48	46	
104	40													55	53	51	49	47	
102	39													55	53	51	49	47	
100	38	Step 1 - Determine HUMIDEX VALUE									54	53	51	49	47	45	43	42	40
99	37								54	52	51	49	47	45	44	42	40	38	
97	36				57	55	53	52	50	49	47	45	44	42	40	39	37		
95	35			56	54	53	51	50	48	47	45	43	42	40	39	37	36		
93	34	56	55	53	52	51	49	48	46	45	43	42	40	39	37	36	34		
91	33	55	54	53	51	50	48	47	46	44	43	41	40	39	37	36	34		
90	32	53	51	50	49	48	46	45	44	42	41	40	38	37	36	34	33		
88	31	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	32		
86	30	48	47	46	44	43	42	41	40	39	37	36	35	34	33	31	30		
84	29	46	45	43	42	41	40	39	38	37	36	35	33	32	31	30	29		
82	28	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28		
81	27	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26		
79	26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25		
77	25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25	24		

Step 2: Place the Humidex value into the Heat Index Adjustment Table below. Determine the applicable adjustments based on the given work or task.

Heat Index Adjustment Table

Step 2 - Risk Factor Adjustment		
Write in value	What is the HUMIDEX value from the table in Step 1?	
Radiant Heat		Adjustment
	Working in full-sun	Add 2
	Working in ½ or partial sun or weak radiant heat source	Add 1
	Working near very hot equipment surfaces or processes	Add 2
Clothing: Pick One Only		
	Short/long sleeve shirt and pants – no overalls	None
	Overalls (e.g., Nomex suit)	Add 3
	Double layer overalls	Add 5
Stop	Impermeable clothing	Perform Physiological Monitoring
Acclimatization		
	Have been working at least 5 of last 7 days in heat stress conditions.	Subtract 4
Work Load & Miscellaneous Factors		
	Light Work (Standing, slow walking)	Subtract 2
	Medium Work (Walking about with moderate lifting or pushing)	None
	Heavy Work (Shoveling dry sand, carrying 50 lbs)	Add 2
	Very Heavy Work (Shoveling wet sand)	Add 3
TOTAL – Compare to Heat Index Response Plan		

Step 3: Compare adjusted Heat Index Total to the Heat Index Response Plan table to obtain guidance for work/rest.

Heat Index Response Plan*

TOTAL NUMBER	Final Step 3 - HEAT INDEX Response
30-33	alert & information & water
34-37	warning & increase water
38-39	75% work - 25% rest & monitor for signs of heat stress
40-41	50% work - 50% rest & monitor for signs of heat stress
42-44	25% work - 75% rest & monitor for signs of heat stress
45+	Perform Physiological Monitoring

* Percent work and rest/recovery are on a per hour basis. Adjustments and subsequent work/rest cycle recommendations are rough guidelines only. No heat stress prediction scheme can replace monitoring of symptoms or a health care practitioners advice in the case of individuals with special medical conditions or predisposing circumstances for heat related illness. Always pay attention to the way workers are feeling. Recuperate if fatigued, nauseated, dizzy or thirsty.

HEAT RASH

Heat rash (prickly heat) may result from continuous exposure to heat or humid air. It appears as red papules (elevated skin lesion), usually in areas where the clothing is restrictive, and gives rise to a prickly sensation, particularly as sweating increases. It occurs in skin that is persistently wetted by un-evaporated sweat. The papules may become infected unless treated.

First Aid for Heat Rash - To prevent heat rash, shower after work, dry off thoroughly, and put on clean, dry underwear and clothes. Try to stay in a cool place after work. If, in spite of this, you develop heat rash, see your physician.

HEAT CRAMPS

Heavy sweating with inadequate electrolyte replacement causes heat cramps. Signs and symptoms include:

- Muscle spasms.
- Pain in the hands, feet and abdomen.

First Aid for Heat Cramps - Leave the work area, and rest in a cool, shaded place.

Mild heat cramps can be treated by drinking beverages that contain salt or eating salty food. Severe heat cramps are treated with fluids and salts given intravenously.

Once the spasms disappear, you may return to work. Taking adequate breaks and drinking electrolyte replacement drink should prevent the cramps from returning.

HEAT EXHAUSTION

Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin.
- Heavy sweating.
- Dizziness.
- Nausea.
- Fainting.
- Headache.
- Blurred vision.
- Vomiting.

The key here is that the victim is still sweating, so the cooling system is still working; it's just under severe stress. The body core temperature may be elevated, but not higher than 104°F (40°C). It is important to recognize and treat these symptoms as soon as possible, as the transition from heat exhaustion to the very hazardous heat stroke can be quite rapid.

First Aid for Heat Exhaustion – Treatment involves replacing fluids (rehydration) and salts and removing the person from the hot environment. If symptoms are mild, sipping cool, slightly salty beverages every few minutes may be all that is needed. Removing or loosening clothing and applying wet cloths or ice packs to the skin also aid cooling.

HEAT STROKE

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels, typically at or above 104°F (40°C). Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin.
- Lack of or reduced perspiration (lack of perspiration may be masked for those wearing chemical protective clothing since perspiration from earlier in the day will be present).
- Nausea.
- Vomiting.
- Dizziness and confusion.
- Strong, rapid pulse.
- Coma.

First Aid for Heat Stroke - THIS IS A MEDICAL EMERGENCY! SUMMON MEDICAL ASSISTANCE IMMEDIATELY!

While awaiting transportation to the hospital, a person should be wrapped in cold, wet bedding or clothing; immersed in a lake, stream, or cool bathtub; or cooled with ice. At the hospital, body cooling is usually accomplished by removing the clothes and covering the exposed skin with water or ice. To speed evaporation and body cooling, a fan may be used to blow air on the body. Body temperature is measured frequently, often constantly. To avoid overcooling, cooling is stopped when the body temperature is reduced to about 102°F (38°C).

HEAT STRESS PREVENTION

The best approach to avoiding heat-related illness is through preventative heat stress management.

Rest areas - A relatively cool, shaded area must be provided for breaks when ambient temperatures exceed 70°F (21°C) and workers are wearing chemical protective clothing (including uncoated Tyvek), or if temperatures exceed 80°F (26°C) and workers are wearing "Level D" coveralls or work clothes. For hazardous waste sites, the rest area should be located in the support zone adjacent to the contamination reduction zone, situated so that part of it is in the decon area so workers can take breaks without going through full decon. If shade is not available, shaded areas shall be constructed. This same type of canopy can be set up to shade personnel performing various types of work in hot weather. Cooling measures other than shade (e.g., misting, air conditioned break areas, air conditioned

vehicles, etc.) can be used in lieu of shade provided it can be demonstrated that they are at least as effective in cooling employees. Employees should have access to these rest areas at break times and at any other time when suffering from heat illness or believing a preventive recovery period is needed.

Liquids - Encourage employees to drink plenty of cool plain water and electrolyte replacement drinks. Supplementing water with cool electrolyte replacement drinks, such as Gatorade, Squench or Quik-kick (drink), is helpful to employees who tend to sweat a lot. Do not use "community cups"; use paper cups. Employees should have access to potable drinking water equivalent to one quart of water per employee per hour during the shift. Less water can be available at the start of the shift provided it is effectively replaced when required.

Have workers drink 16 ounces (0.5 liters) of drink before beginning work, such as in the morning and after lunch. At each break, workers should drink 8 to 16 ounces (0.25 to 0.5 liters). Employees should not wait until they are thirsty to drink.

Discourage the use of alcohol during non-working hours, and discourage the intake of coffee during work hours, as these make heat stress control more difficult.

Acclimatization - This is the process by which your body "gets used to" hot work environments. This is achieved by slowly increasing workloads. Start at 50 percent capacity on day one, and increase by 10 percent per day; on day six, you'll be at 100 percent. You don't lose acclimatization over a weekend, but it'll start to decrease after three to four days. If you don't do hot work for a week, the acclimatization is gone. You don't have to do full shift hot work to achieve or retain acclimatization; a minimum of 100 minutes of continuous hot work exposure per day is adequate.

Auxiliary Cooling - Auxiliary cooling is usually obtained by providing workers with a specially-designed vest, which is worn under the protective clothing, but over any underclothing. These vests typically provide cooling via one of two methods: the use of ice or other frozen media, or the use of a vortex cooler. Each method has its advantages and disadvantages.

The frozen media vest requires a means for freezing the media, and the media (usually water or "blue ice") will melt, requiring replacement.

The vortex cooler tends to cool more uniformly. Instead of frozen media, this vest uses the expansion of compressed air to cool the wearer. The drawback is the compressed air requirement, but this is negated when the wearer is already using an airline respirator supplied by a compressor. A vortex cooler should not be supplied from air cylinders, as this will draw down the cylinders rapidly.

Auxiliary cooling should be considered when the following conditions exist:

- Ambient temperature over 80°F (26°C).
- Workers are wearing impermeable garments (i.e., Tyvek, Saranex, Chemrel, etc.).
- It is desirable to have long work shifts with minimum interruption.

**URS SAFETY MANAGEMENT STANDARD 019
HEAVY EQUIPMENT OPERATIONS**

URS SAFETY MANAGEMENT STANDARD

Heavy Equipment Operations

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where heavy equipment is in operation by URS employees or subcontractors.

2. Purpose and Scope

The purpose of this standard is to require that heavy equipment is operated in a safe manner; that the equipment is properly maintained; and that ground personnel are protected. Heavy equipment includes construction and mining equipment such as backhoes, excavators, skid steers, graders, loaders, dozers, tractors, cranes, drills, and draglines.

In addition to this standard, refer to SMS 038 – Cranes and Derricks; and SMS 056 – Drilling Safety.

Military related vehicles and equipment (e.g., tanks) are not covered under this standard.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Authorized Operators

1. Evaluate operators through documented experience (resume), and as appropriate, a practical evaluation of skills. Supplemental Information A through G, or a similar method, may be used for evaluating operators.
2. Allow only qualified operators to operate equipment. Trainees may operate equipment under the direct supervision of a trainer.
3. Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.
4. Maintain a list of operators for the project, and the specific equipment that they are authorized to operate.

URS SAFETY MANAGEMENT STANDARD

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5. Require operators to use seatbelts at all times in all equipment and trucks.
6. Except where allowed by the manufacturer, prohibit personnel other than the operator from riding in or on the equipment unless additional seating (with seatbelts) is provided by the manufacturer. In some cases, a trainer may ride in a cab not equipped with additional seating when training activities are being conducted.
7. Operators must maintain three points of contact whenever mounting and dismounting a piece of equipment.
8. Brief operators on the following rules of operation:
 - a. Operators are in control of their work area.
 - b. Equipment must be operated in a safe manner and within the constraints of the manufacturer's Operation Manual.
 - c. Operators must stop work whenever unauthorized ground personnel or equipment enter their work area, and only resume work when the area has been cleared.
 - d. Operators must not use mobile phones while operating heavy equipment.

B. Ground Personnel

1. Require that URS ground personnel or ground personnel interacting with URS heavy equipment operations have received training, and comply with the following rules of engagement:
 - a. Wear high-visibility protective vests when in work areas with any operating equipment.
 - b. Stay outside of the swing zone or work area of any operating equipment.
 - c. No standing or working in the equipment operator's blind spots.
 - d. Ground personnel may only enter the swing or work area of any operating equipment when:

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1. They have attracted the operator's attention and made eye contact.
 2. The operator has idled the equipment down, placed it in neutral, grounded engaging tools, and set brakes.
 3. The operator gives the ground personnel permission to approach.
- e. Ground personnel must never walk, or position themselves between, any fixed object (e.g., working face, highwall) and operating equipment, or between two operating pieces of equipment.

C. Equipment

1. Maintain operation manuals at the site for each piece of equipment that is present on the site and in use.
2. Require that operators have read or been trained on the manual for the equipment, and operate the equipment within the parameters of the manual and this standard.
3. Require that all equipment is provided with roll-over protection systems (ROPS). Tracked excavators, road trucks, and drills are exempt from ROPS requirements, but must have a cab that provides protection from overhead hazards.
4. Verify that seatbelts are present and functional in all equipment.
5. Prohibit the use of equipment that has or had cab glass (per the manufacturer's specifications) that is cracked, broken, or missing.
6. Require that backup alarms are functional on all trucks and equipment. Tracked excavators must have bi-directional alarms, or the operator must be provided with a spotter whenever tracking in either direction.
7. Require all extensions such as buckets, blades, forks, etc., to be grounded when not in use.
8. Require brakes to be set and wheels chocked or equivalent (when applicable) when not in use.

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9. Require fire extinguishers to be placed on all vehicles or equipment as required, and inspected by the operator prior to each shift. Monthly inspection and service records will be maintained in the project office, if not kept on the extinguishing equipment.
10. Require that all haulage vehicles, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, has a cable shield and/or canopy adequate to protect the operator from shifting or falling material. If protection is not available for the operator, the operator must leave the vehicle and wait in a designated safe location until it is loaded.
11. Require that a locking device be provided that will prevent the accidental separation of towed and towing vehicles on every fifth-wheel mechanism and two-bar arrangement.
12. Require that trip handles for tailgates of dump trucks and heavy equipment be arranged so that when dumping, the operator will be in the clear.
13. Require that motors and engines are shut off during fueling or maintenance operations. Ensure proper grounding/bonding between equipment and fuel vehicle prior to fueling operations. During fueling operations, ensure the fuel nozzle remains in contact with the tank and no smoking or open flame is present in the immediate area.

D. Subcontractor Equipment

1. Require that no unsafe vehicles or equipment be allowed in construction areas. Where compliance is refused, the project manager or his or her designate should be notified immediately.
2. Require that subcontractor employees follow established safety procedures in operation, inspection, and maintenance of vehicles and equipment.
3. Require that URS supervisors visually observe the subcontractors' vehicles and equipment, and report any unsafe conditions or practices to the project manager. Equipment not in compliance with applicable safety standards is prohibited.

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Heavy Equipment Operations

E. Safe Operation

1. All vehicles transporting material or equipment on public roads must comply with local laws pertaining to weight, height, length, and width. Obtain any permits required for these loads.
2. Prohibit operating Company-owned, leased, or rented vehicles or equipment while under the influence of alcohol or illegal drugs.
3. Require seatbelts to be worn for all operators, drivers, and passengers for company owned or leased vehicles and equipment.
4. Do not drive equipment into an unsafe area. This includes areas of construction where unnecessary tire, steering, or body damage could result, or where soil conditions are not adequate to support the equipment.
5. Do not smoke on, in, or within 50 feet (15 meters) of vehicles hauling fuel oils, gasoline, or explosives.
6. Do not ride with arms or legs outside of the truck body, in a standing position on the body, on running boards, or seated on side fenders, cabs, cab shields, rear of truck bed, or on the load.
7. Do not drive any vehicle at a speed greater than is reasonable and proper, with due regard for weather, traffic, intersections, width, and character of the roadway, type of motor vehicles, and any other existing condition.
8. Oilers, apprentices, and other operators will not be allowed to operate equipment unless authorized by the project manager or general superintendent.
9. Do not operate any equipment beyond its safe load or operational limits.
10. Keep all employees clear of loads about to be lifted, or suspended loads.
11. Outfit equipment operated in hazardous atmosphere environments with the proper safety equipment (e.g., spark arrestors).
12. Utilize equipment with enclosed cabs where feasible or accessible. Where use of equipment with enclosed cabs is not feasible or said

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Heavy Equipment Operations

equipment is not accessible, require that operators use eye protection in accordance with potential airborne hazards present.

F. Inspection and Maintenance

1. Require operators to inspect equipment daily (or before each shift), using Attachment 019-1 NA or equivalent.
2. Prohibit use of equipment deemed to be unsafe, as determined by daily inspection, until required repairs or maintenance has been completed.
3. Conduct maintenance as prescribed by the manufacturer in the Operation Manuals for each piece of equipment.
4. During maintenance and repair, require that:
 - a. Motors are turned off, unless required for performing maintenance or repair.
 - b. All ground-engaging tools are grounded or securely blocked.
 - c. Controls are set in a neutral position.
 - d. Brakes are set.
 - e. Electrically driven equipment is installed with provision for tagging and locking out the controls while under repair.
 - f. Manufacturer's requirements for maintenance and repair are followed.
5. Provide and use a safety tire rack, cage, or equivalent protection when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.
6. Maintenance records for any service, repair or modification which affects the safe performance of the equipment must be maintained and reasonably available to operator and maintenance personnel.

5. Documentation Summary

The following information will be maintained in the project file:

- A. Operator qualifications.

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Heavy Equipment Operations

- B. Daily Equipment Inspection Logs, Attachment 019-1 NA, or equivalent.
- C. Site briefing documentation for operator rules and ground personnel "rules of engagement".

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard – [Motorized Vehicles and Mechanized Equipment](#) – 29 Code of Federal Regulations (CFR) 1926, Subpart O
- B. U.S. Mine Safety and Health Administration – [30 CFR 48](#) – Training and Retraining Miners
- C. U.S. Mine Safety and Health Administration – [30 CFR 56](#) Subpart H – Loading, Hauling, and Dumping
- D. U.S. Mine Safety and Health Administration – [30 CFR 56](#) Subpart M – Machinery and Equipment
- E. U.S. Mine Safety and Health Administration – [30 CFR 77](#) Subpart E – Safeguards for Mechanical Equipment
- F. U.S. Mine Safety and Health Administration – [30 CFR 77](#) Subpart K – Ground Control
- G. U.S. Mine Safety and Health Administration – [30 CFR 77](#) Subpart Q – Loading and Haulage
- H. [National Association of Demolition Contractors](#) – Safety Manual
- I. [SMS 038](#) – Cranes and Derricks
- J. [SMS 056](#) – Drilling Safety
- K. [Attachment 019-1 NA](#) – Equipment Inspection Form

Note: The above regulatory resources are for U.S. operations only.

7. Supplemental Information

- A. [Backhoe Operator Skill Evaluation](#)
- B. [Scraper Operator Skill Evaluation](#)

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Heavy Equipment Operations

- C. [Bulldozer Operator Skill Evaluation](#)
- D. [Dump Truck Operator Skill Evaluation](#)
- E. [Roller/Compactor Skill Evaluation](#)
- F. [Front-End Loader Operator Skill Evaluation](#)
- G. [Grader Operator Skill Evaluation](#)
- H. [Excavator Operator Skill Evaluation](#)
- I. [Water Truck Operator Skill Evaluation](#)



Health, Safety and Environment
DAILY HEAVY EQUIPMENT
SAFETY INSPECTION CHECKLIST

Attachment 019-1 NA
 Issue Date: June 1999
 Revision 7: September 2011

Equipment ID No: _____ Inspector's Name: _____

Equipment Name: _____ Employee No.: _____

Beg. Hours: _____ End Hours: _____ Date: _____

INSTRUCTIONS: Each shift must inspect all applicable items indicated. If an unsatisfactory condition is observed, suspend operation of the equipment and report the unsatisfactory condition to the site supervisor immediately.

ITEM INSPECTED	CHECK IF SATISFACTORY	COMMENTS	CORRECTED BY	DATE
Equipment Operating Manuals Available	<input type="checkbox"/>			
Falling Object Protective Structure (FOP)	<input type="checkbox"/>			
Roll-Over Protection Structure (ROP)	<input type="checkbox"/>			
Seat Belts	<input type="checkbox"/>			
Operator Seat Bar(s)	<input type="checkbox"/>			
Side Shields, Screens, or Cab	<input type="checkbox"/>			
Lift-Arm Device	<input type="checkbox"/>			
Grab Handles	<input type="checkbox"/>			
Back-up Alarm – Working	<input type="checkbox"/>			
Lights	<input type="checkbox"/>			
Guards	<input type="checkbox"/>			
Horn	<input type="checkbox"/>			
Windshield Wipers	<input type="checkbox"/>			
Glass, Mirrors	<input type="checkbox"/>			
Anti-Skid Tread Clear of Mud	<input type="checkbox"/>			
Safety Signs (i.e., counterbalance swing area)	<input type="checkbox"/>			
Fire Extinguisher	<input type="checkbox"/>			
General Condition	<input type="checkbox"/>			
Fuel Connection	<input type="checkbox"/>			
Oil (fuel and no leaks)	<input type="checkbox"/>			
Clear of Extra Materials	<input type="checkbox"/>			
Controls Function Properly	<input type="checkbox"/>			
Hydraulic System (full and no leaks)	<input type="checkbox"/>			
Parking Brake	<input type="checkbox"/>			
Lift Arm and Bucket	<input type="checkbox"/>			
Tires/Tracks	<input type="checkbox"/>			
Steering	<input type="checkbox"/>			
Breathing Air System	<input type="checkbox"/>			
Blast Shields	<input type="checkbox"/>			
Flammable Atmosphere Protective Equipment	<input type="checkbox"/>			
Quantity of Fuel Added	<input type="checkbox"/>			
Quantity of Oil Added	<input type="checkbox"/>			

Operator Signature _____



Health, Safety and Environment
BACKHOE OPERATOR SKILL EVALUATION

SMS 019 NA
Supplemental Information A
Issue Date: February 2009
Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

This equipment is used primarily for excavation, although it may occasionally be used for other miscellaneous tasks for which crane or stick type equipment is required.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts, leaks; oil, hydraulic and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires if applicable g) Glass, wipers h) Gauges, including temperature, oil, and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Excavating techniques a) Benching, sloping b) Spoil removal from side wall c) Back filling operations d) Aware of surroundings and personnel near the swing radius of boom	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Can arrange controls and boom for travel	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Speed in relation to terrain (controlled speed)	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Stock piling with front end bucket	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Loading truck bed with bucket	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Set all park brakes d) Lower bucket to ground e) Perform a general walk around looking for items for maintenance	<input type="checkbox"/> Yes <input type="checkbox"/> No



Health, Safety and Environment
SCRAPER OPERATOR SKILL EVALUATION

SMS 019 NA
 Supplemental Information B
 Issue Date: February 2009
 Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Drives a tractor to pull a steel bowl-like or box-like scoop (scraper), mounted on wheels, which scrapes up earth and transports it to a designated place; manipulates a series of levers to lower cutting edge of the scraper into the ground, to raise cutting edge when scraper is full, and to empty scraper.

STEPS	KEYPOINTS	SATISFACTORY
1.	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluids and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	Loading techniques a) Use of apron b) Use of cutting edge c) Pump loading etc	<input type="checkbox"/> Yes <input type="checkbox"/> No
4.	Shifting and hauling	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.	Rough cut and fill	<input type="checkbox"/> Yes <input type="checkbox"/> No
6.	Spreading material	<input type="checkbox"/> Yes <input type="checkbox"/> No
7.	Fine grading	<input type="checkbox"/> Yes <input type="checkbox"/> No
8.	Obtaining compaction	<input type="checkbox"/> Yes <input type="checkbox"/> No
9.	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower apron d) Lower bowl to the ground e) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Date _____ Employee Name _____ Supervisor _____

Description:

Operates a large tractor with a concave steel blade or push block mounted in front of the chassis to level, distribute and push earth. This equipment may be used to push earth carrying equipment. At times a ripper attachment is used for ripping the earth prior to loading the scraper. Operator regulates height of blade or push block from ground and may help in necessary adjustments to equipment as needed.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tracks g) Glass, wipers h) Gauges, including temperature, oil, air and fuel i) Audible horn v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Pushing techniques a) Use of push blade b) Loading of push load equipment	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Use of ripper shanks	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Rough cut and fill	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Spreading material	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Fine grading	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Obtaining compaction by tracking in material	<input type="checkbox"/> Yes <input type="checkbox"/> No
9)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower rippers d) Lower blade to the ground e) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Date _____ Employee Name _____ Supervisor _____

Description:

Drives a heavy-duty gasoline or diesel-powered truck used in hauling material to fill areas or dump sites. The truck is either a tandem rear axle type, or is a tractor truck, single or tandem axle, pulling a trailer. May service and make necessary adjustments for proper operation of equipment.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational (1) Brakes (2) Lights (3) Back-up alarms (4) Hand rails & ladders (5) Seat belts (6) Tires (7) Glass, wipers (8) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Truck Weighing a) Tare weights b) Gross Weights	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Loading Techniques a) Parking into load patterns b) Bed preparation for material	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Shifting and Hauling	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Stockpiling	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Backing with the use of mirrors	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Dumping/Spreading Material a) Fill material b) Base course material c) Surface materials d) Asphalt e) Lowers truck bed (dump trucks) or dump chutes (belly dumps)	<input type="checkbox"/> Yes <input type="checkbox"/> No
9)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Use park brake d) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Health, Safety and Environment
**ROLLER / COMPACTOR OPERATOR
SKILL EVALUATION**

SMS 019 NA
Supplemental Information E
Issue Date: February 2009
Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Operates a self-propelled gasoline or diesel machine, which has steel wheels used to compact earth fills, flexible bases and all types of materials. Rollers are also used for compaction to achieve a desired or specified density. Rides on the machine platform and moves lever and pedals or throttles to control and guide machine.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires, if applicable g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Rolling techniques to obtain compaction a) Use of controls b) Vibratory controls c) Turns and maneuvers d) Aware of surroundings	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Rolling patterns a) Staggered patterns with other rollers	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Health, Safety and Environment
**FRONT END LOADER
OPERATOR SKILL EVALUATION**

SMS 019 NA
Supplemental Information F

Issue Date: February 2009
Revision 2: August 2010

Date _____ Employee Name _____ Supervisor _____

Description:

Operates a rubber tire or crawler type tractor with an attached bucket on front end. Moves a lever to raise and lower and dump contents of bucket. Machine is used to load materials from stockpiles, excavation, loading trucks.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Loading techniques a) Use of bucket and controls b) Crowding the pile c) Pump loading, etc. d) Loading patterns e) Loading trucks f) Loading scrapers	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Control handling of contaminated soils	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Shifting and hauling	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Stockpiling	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Mixing and moisture conditioning	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Feeding crusher	<input type="checkbox"/> Yes <input type="checkbox"/> No
9)	Rough cut and fill	<input type="checkbox"/> Yes <input type="checkbox"/> No
10)	Spreading material	<input type="checkbox"/> Yes <input type="checkbox"/> No
11)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower bucket to the ground d) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Date _____ Employee Name _____ Supervisor _____

Description:

Rides in control cab of grader and moves levers and hand wheels to guide machine and regulate the scraper blade. Blade is mounted on a carrying and turning circle at the front of the machine. Equipment is used to level or mix soils and aggregates to grade and to lay asphalt and flexible base materials.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Leveling and scraping techniques a) Use of levers b) Use of cutting edge c) Controlling front wheel tilt d) Controlling crab motion	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Shifting and traveling with loaded moe board	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Rough cut and fill	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Spreading material	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Fine grading	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower moe board to the ground d) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Date _____ Employee Name _____ Supervisor _____

Description:

Operates a rubber tire or crawler type tractor with an attached bucket on front end. Moves a lever to raise and lower and dump contents of bucket. Machine is used to load materials from stockpiles, excavation, loading trucks.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Loading techniques a) Use of bucket and controls b) Crowding the pile c) Pump loading, etc. d) Loading patterns e) Loading trucks f) Loading scrapers	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Control handling of contaminated soils	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Shifting and hauling	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Stockpiling	<input type="checkbox"/> Yes <input type="checkbox"/> No
7)	Mixing and moisture conditioning	<input type="checkbox"/> Yes <input type="checkbox"/> No
8)	Feeding crusher	<input type="checkbox"/> Yes <input type="checkbox"/> No
9)	Rough cut and fill	<input type="checkbox"/> Yes <input type="checkbox"/> No
10)	Spreading material	<input type="checkbox"/> Yes <input type="checkbox"/> No
11)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Lower bucket to the ground d) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No



Health, Safety and Environment
**WATER TRUCK OPERATOR
SKILL EVALUATION**

SMS 019 NA
Supplemental Information I
Issue Date: September 2011

Date _____ Employee Name _____ Supervisor _____

Description:

Drives a pull type or truck type water truck. Waters roads, fills, and cut areas to suppress dust.

STEPS	KEYPOINTS	SATISFACTORY
1)	Demonstrated abilities a) Pre-shift inspection check list i) Check equipment for loose bolts and leaks; check oil, air, hydraulic fluid and water ii) Make sure area around the equipment is clear of people and other equipment iii) Check for fire extinguisher iv) Make sure that the following equipment is operational a) Brakes b) Lights c) Back-up alarms d) Hand rails & ladders e) Seat belts f) Tires g) Glass, wipers h) Gauges, including temperature, oil, air and fuel v) Notify supervision of any equipment that is not operational vi) The operator can park or side line a piece of equipment that is unsafe to operate if it poses a danger or hazard to employees or property	<input type="checkbox"/> Yes <input type="checkbox"/> No
2)	Identification of equipment controls	<input type="checkbox"/> Yes <input type="checkbox"/> No
3)	Loading Techniques a) Minimizes spillage b) Uses chocks or turns into berm	<input type="checkbox"/> Yes <input type="checkbox"/> No
4)	Shifting and Hauling	<input type="checkbox"/> Yes <input type="checkbox"/> No
5)	Properly applies water to ramps/corners	<input type="checkbox"/> Yes <input type="checkbox"/> No
6)	Backing with the use of mirrors	<input type="checkbox"/> Yes <input type="checkbox"/> No
11)	Parking and shut down procedures a) Equipment line-up i) Straight line ii) Allow easy access for service b) Turn off all accessories c) Use park break d) Perform a general walk around looking for maintenance items	<input type="checkbox"/> Yes <input type="checkbox"/> No

URS SAFETY MANAGEMENT STANDARD 021
HOUSEKEEPING

URS SAFETY MANAGEMENT STANDARD

Housekeeping

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to ensure proper housekeeping in office locations, on construction sites, and fixed work facilities to prevent cross contamination of hazardous materials, fires, and injuries resulting from slips, trips and falls.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility or site.

4. Requirements

A. General

1. Require tools, materials, extension cords, hoses, and other equipment to be stowed at the end of the day. These materials must not be strewn about the site in a manner that may cause tripping or other hazards while in use.
2. Clear general waste, scraps, debris, and rubbish from work areas, passageways, and stairs in and around the facility on a daily basis. Do not throw or drop materials from upper levels to lower levels or to the ground unless disposal areas are provided and the area below is barricaded or secured.
3. Provide metal or other approved containers in adequate numbers to handle waste and rubbish disposal.
4. Garbage (including solid or liquid wastes), refuse, and hazardous waste such as caustics, acids, and toxic materials must be stored in approved and covered containers. Containers must be appropriately labeled as to contents. SMS 009 – Corrosive and Reactive Materials and SMS 017 – Hazardous Waste Operations, provide additional information on hazardous materials.
5. Store supplies and generated wastes or scrap in locations away from walkways and in a manner that will not trip workers. Maintain

URS SAFETY MANAGEMENT STANDARD

Housekeeping

stored materials in safe, neat stockpiles for ease of access and to prevent collapse or falling.

6. Keep weeds and vegetation away from stockpiled materials and walkways.
7. Maintain flooring, stairways, gangways, access ways, and walkways in a clean, dry, and smooth condition.
8. Ensure that oil, grease, water, ice, or other hazardous materials that may cause slipping or fire hazards are removed promptly.
9. Ensure employees are trained in appropriate waste disposal procedures.
10. Identify a member of line management (typically a site supervisor or foreman) with the responsibility of ensuring proper waste disposal and storage requirements are followed.

B. Regularly inspect the work area for slip and trip hazards.

1. Office and trailer locations – Inspect work areas at least quarterly. Use the inspection sheet provided as Attachment 021-1 NA.
2. Field sites – Inspect sites at least biweekly. Use the inspection sheet provided as Attachment 021-1 NA.
3. Field sites performing aircraft and vehicle maintenance – Inspect the sites weekly if sanding, drilling, grinding, and/or painting operations are conducted. Use the inspection sheet provided as Attachment 021-2 NA.
4. For European operations, the Workplace Inspection Checklist - Attachment 021-3 NA must be completed monthly.

C. Thoroughly investigate all injuries resulting from slips, trips, and falls on site. Correct those housekeeping conditions contributing to injuries.

D. Project management personnel shall address the following issues in project pre-planning:

1. Estimate the types and quantities of waste or scrap generated during site-specific project activities.

URS SAFETY MANAGEMENT STANDARD

Housekeeping

2. Identify any needs for specialized containers or waste disposal services.
 3. Coordinate waste disposal options with the client.
 4. Identify any hazards associated with handling or storage of waste or scrap and determine if control measures, including engineering, administrative controls, or personal protective equipment, are required.
 5. Identify waste or scrap handling and storage procedures that will minimize impacts to site personnel, client operations, and the environment.
 6. Identify waste segregation criteria, as well as opportunities for recycling.
- E. For operations involving work with hazardous materials (including metals associated with aviation maintenance activities), the manager directing activities of the facility or site will assure that:
1. Eating, drinking, and smoking areas are removed from the work areas. Hand washing stations shall be available nearby for employees entering the eating and smoking areas.
 2. Resting, eating and smoking areas will be kept clean.
 3. Work areas will be cleaned to remove accumulated contaminants. Working surfaces, including workbenches, desks, and other lateral working surfaces, will be wiped down daily with an appropriate cleaner (soap, solvent, or oxidizing agent). Walking surfaces will be cleaned to remove accumulated contaminants weekly or more often.

5. Documentation Summary

The following information will be maintained in the project file:

- A. Completed Inspection Sheets.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard – [Sanitation – 29 Code of Federal Regulations \(CFR\) 1910.141](#)

URS SAFETY MANAGEMENT STANDARD
Housekeeping

- B. U.S. OSHA Standard – [Walking and Working Surfaces – 29 CFR 1910.22.](#)
- E. [SMS 009](#) – Corrosive and Reactive Materials
- F. [SMS 017](#) – Hazardous Waste Operations
- G. [Attachment 021-1 NA](#) – Housekeeping Inspection Sheet
- H. [Attachment 021-2 NA](#) – Special Housekeeping Inspection Sheet - Sanding, Drilling, Grinding, and Painting
- I. [Attachment 021-3 NA](#) – Workplace Inspection Checklist



HOUSEKEEPING INSPECTION SHEET

Building or Location: _____

Inspection Conducted by: _____ **Date:** _____

Check Yes, No, or NA for Not Applicable.

General Site Housekeeping

- 1. Do not block exits or emergency equipment. Yes No NA
- 2. Do not leave equipment or materials lying on the ground. Yes No NA
- 3. Keep storage areas free from the accumulation of materials that constitute trip hazards. Yes No NA
- 4. Remove scrap materials and other debris from work area. Yes No NA
- 5. Remove combustible scrap and debris by safe means at regular intervals. Yes No NA
- 6. Store oily rags in metal cans with tight fitting lids. Remove oily rags at the end of the day. Yes No NA

Visibility

- 7. Ensure that halls, stairways and walkways are well lit. Yes No NA
- 8. Ensure that well designed light switches are present in areas where walkways are not always lighted. Yes No NA
- 9. Ensure that dust, smoke or steam does not create poor visibility. Yes No NA
- 10. Ensure that glare from floodlights or windows does not create poor visibility in work areas. Yes No NA

Stairs

- 11. Ensure that handrails are tight and at the proper level. Yes No NA
- 12. Ensure that handrails extend past the top and bottom step. Yes No NA
- 13. Ensure that white or yellow strips are painted on the first and last step for better visibility. (Not an OSHA requirement – recommendation only). Yes No NA
- 14. Ensure that steps are not rough or defective. Yes No NA
- 15. Ensure that stair treads are wide enough and risers consistently spaced. Yes No NA
- 16. Ensure that stairs are free of obstructions. Yes No NA

Floor Conditions

- 17. Ensure that floors of every workroom are clean, and so far as possible, in a dry condition. Yes No NA
- 18. Ensure that floors are not oily, overly waxed, or polished. Yes No NA
- 19. Where wet floors or processes are present, provide proper drainage and false floors, mats, or other dry standing places. Yes No NA
- 20. Finish floor surfaces with non-slip coatings where spills are likely. Yes No NA
- 21. Ensure that floors and passageways are free from protruding nails, splinters, holes, or loose boards. Yes No NA
- 22. Ensure that floors are free of holes and depressions. Yes No NA
- 23. Ensure that aisles or pathways are wide enough for easy passage and for carrying objects (48 inches is recommended). Yes No NA



HOUSEKEEPING INSPECTION SHEET

- 24. Ensure that ramps are covered with non-slip surfaces or matting. Yes No NA
- 25. Keep carpets or rugs free from loose or frayed edges that may catch boots or shoes. Yes No NA
- 26. Keep walkways free from extension cords, air hoses and cables. Yes No NA
- 27. Keep pathways free from boxes, containers, machine parts, or other tripping hazards. Yes No NA

Ground Conditions

- 28. Ensure that trip hazards are not present. Yes No NA
- 29. Ensure that fall hazards are not present. Yes No NA
- 30. Ensure that holes or changes in ground elevation are either filled or guarded. Yes No NA
- 31. Ensure that muddy walkways are filled with gravel to reduce slipping. Yes No NA
- 32. Ensure that all employees who work in wet or greasy conditions wear slip resistant footwear. Yes No NA

Equipment

- 33. Ensure that vehicle steps are of adequate size, surface placement for safe dismounting. Yes No NA
- 34. Ensure that hand grips or ladders are adequate for getting into and out of equipment. Yes No NA
- 35. Ensure that ladders have been checked for damage and removed from service if found unsafe. Yes No NA

Identify areas that need attention and describe the corrective actions to be implemented:

I certify that the above inspection was performed to the best of my knowledge and ability, based on the conditions present on:

Signature

Week Ending: _____

Checklist Completed by: _____

The following checklist will be used as a guide and is considered the minimum housekeeping requirement for work areas where sanding, drilling, and grinding operations on aircraft and vehicles are performed. Dust from sanding/drilling/grinding on aircraft and vehicles contain metals, chemical coatings, and paint-based contaminants that can accumulate on work areas and flat surfaces. Good housekeeping practices throughout the work area are the key to mitigating this hazard.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
1. Remove all metal grindings and dust from sanding or grinding areas using a vacuum equipped with a HEPA filter.	<input type="checkbox"/>						
2. Remove contaminants on top of flat surfaces with HEPA-filter–equipped vacuum. <i>Do not use fox-tails or low pressure air to blow dust off work benches, work areas or clothes.</i>	<input type="checkbox"/>						
3. Wipe down surfaces of workbenches with damp rags using water and a surface-active cleanser. (A weekly requirement, more often if needed)	<input type="checkbox"/>						
4. Sweep floors daily, without creating dust clouds. Wet mop work area floors. (A weekly requirement using water and a surface-active cleanser).	<input type="checkbox"/>						
5. Wipe down all other surfaces (besides the workbench) where dust collects using damp rags. (A bi-weekly requirement).	<input type="checkbox"/>						
6. Monitor personnel to ensure no drinking or eating occurs in the industrial work areas.	<input type="checkbox"/>						
7. Monitor personnel recognizing the hazards of cross contamination. Ensure all personnel are washing their hands before eating, drinking, or smoking on breaks.	<input type="checkbox"/>						

Identify areas that need attention and describe the corrective actions to be implemented:

	Health, Safety and Environment	Attachment 021-3 NA
	WORKPLACE INSPECTION CHECKLIST	Issue Date: June 1999 Revision 5: August 2010

To be filled in as directed by the **quarterly procedures checklists** (see attached).

- Where no problems have been identified, place a tick in the appropriate box under the date of the inspection.
- Where a problem has been identified, log this into the HSE and Quality Improvement Database (European Operations only) so that Corrective Action can be put in place.

Office:	Inspected By:									Year:			
Month:	J	F	M	A	M	J	J	A	S	O	N	D	
Date of Inspection:													
1. Accident book (UK)	<input type="checkbox"/>												
2. Fire	<input type="checkbox"/>												
3. Entrances and doors	<input type="checkbox"/>												
4. Workstations & equipment	<input type="checkbox"/>												
5. Restricted areas	<input type="checkbox"/>												
6. Steps/staircases/ladders	<input type="checkbox"/>												
7. Floors	<input type="checkbox"/>												
8. Electrical Equipment	<input type="checkbox"/>												
9. Lighting	<input type="checkbox"/>												
10. Temperature	<input type="checkbox"/>												
11. Building services	<input type="checkbox"/>												
12. Ventilation	<input type="checkbox"/>												
13. Toilet facilities	<input type="checkbox"/>												
14. Kitchens	<input type="checkbox"/>												
15. General cleanliness	<input type="checkbox"/>												
16. Chemical substances	<input type="checkbox"/>												
17. Refuse facilities	<input type="checkbox"/>												
18. First Aid	<input type="checkbox"/>												
19. Access roads and car parks	<input type="checkbox"/>												
20. Lifts	<input type="checkbox"/>												
21. Display Screen Equipment	<input type="checkbox"/>												
22. Systems of Work	<input type="checkbox"/>												
23. Water	<input type="checkbox"/>												
24. Electrical Installation	<input type="checkbox"/>												
25. H&S Meetings/Notices	<input type="checkbox"/>												

	Health, Safety and Environment WORKPLACE INSPECTION CHECKLIST	Attachment 021-3 NA Issue Date: June 1999 Revision 5: August 2010
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QUARTERLY OFFICE CHECKS - GUIDANCE NOTES/CHECKLISTS

To help in the completion of the "Workplace Inspection Checklist" the following brief notes summarise some of the most important aspects. Individual offices may need to modify them to deal with their particular arrangements.

The aspects are listed below in the same order as on the Form.

1. Accident Book (UK)	
Location	During the walk round inspection of the office, investigate the cause of any entries made during the previous month.
Reporting	All accidents/injuries dangerous occurrences known to have occurred in the property during the past month to be adequately reported.
Check Site	Employees to have easy access to the accident book whenever necessary.
2. Fire	
Fire Doors Fire Exits	All fire doors and exits to be closed, unobstructed and easy to open.
Fire Extinguishers	On hooks/brackets provided.
Records	Check that weekly fire alarm test is being carried out and that fire alarm system is being maintained
3. Entrances and Doors	
Entrances	Doors and doorways not obstructed by any article or substance. Doormats/doorsteps securely fixed and not constituting a tripping hazard.
Doors	Doors and gates secure on their hinges or sliding runners. Glazing panels on 2-way doors not covered over. Fire doors not fastened or wedged open. Fire doors able to completely close from fully open, automatically.
4. Workstations and Equipment	
Workstations (NB: Includes maintenance tools, equipment, printing equipment, etc.)	Workstation furniture and work equipment safe, clean and in a good state of repair. Workstation furniture and work equipment suitable for the person using it and for the work they are doing.
Equipment	To meet requirements of Safety System.
5. Restricted Areas	
Access Secured	Doors securely locked. Unauthorised access impossible by normal (unforced) means.
Keys	Keys not accessible to unauthorised persons.
6. Steps, Staircases and Ladders	
Structure	Treads and handrails secure and in good repair.
Tripping	Carpets/coverings untorn and secure. Edge strips well fixed. Steps and staircases free from litter. Stairs and landings clear of any unnecessary obstructions.
Slipping	Surfaces of steps not slippery. Spillages have been properly cleaned up.
Lighting	All stairs adequately lit so that the edges of each step can be clearly seen.
Cleanliness	All steps/staircases clean and free from dust dirt and litter.
Ladders	<u>No part of ladder damaged or weakened.</u> Securely positioned/fixated at base and top to prevent slipping, moving or falling of ladder when in use, or held by another person stationed at the foot of the ladder, at a slope of approximately 75°.

	Health, Safety and Environment	Attachment 021-3 NA
	WORKPLACE INSPECTION CHECKLIST	Issue Date: June 1999 Revision 5: August 2010

	Inspection Record available
7. Floors	
Tripping	All floor coverings even, level and securely fixed down. No obstructions in thoroughfares, which could cause people to trip or fall.
Slipping	Where floor surfaces are being polished, suitable signs warning of the slipping hazard are being displayed. Spillages have been properly cleaned up.
Cleanliness	All floors are clean and free from dust, dirt and litter.
8. Electrical Equipment	
Electrical Equipment	Working satisfactorily Undamaged in any way. All used in a proper and safe manner.
Wiring	No exposed wires or circuitry.
Portable Electric Equipment	Checked in accordance with SMS 012.
9. Lighting	
Lamps, Light Fittings and Switches	All lamps working satisfactorily and providing suitable light intensity. Light fittings are suitably orientated for task/ activity. Not damaged in any way, securely fixed and clean.
10. Temperature	
Services Functioning	Air conditioning and heating systems operating as and when required.
Air Temperature	No complaints of low or high temperatures from the building occupants (offices should be >16°C after first hour).
Draughts	No unacceptable draughts around doors, windows or grilles or through fixed or broken openings.
Thermometers	One thermometer to be provided for each floor.
11. Building Services Equipment	
Indications of Malfunctioning Building Services Equipment:	Leaks of water, oil or gas. Presence of unfamiliar noises. Presence of unfamiliar smells. Non-operation of important components. Gauges showing abnormal readings.
12. Ventilation	
Indications of Inadequate Ventilation Rates:	Presence of strong odours. Very high temperatures in summer. Condensation problems. Draughts.
13. Toilet Facilities	
Hygienic	WCs, urinals, floors, hand basins, taps and door handles kept clean.
Tidy	Toilet areas not used for storage or food/drink preparation. Litter-free and bins (including sanitary) regularly emptied.
Well Stocked	Sufficient and suitable provision of toilet paper and soap.
Well Maintained	Mechanical hand drying facilities fully operational, if provided. Towels clean, if provided. WC's, urinals, hand basins and taps in good order and functioning properly.
Ventilation	Mechanical ventilation is operational, ie. providing and/or extracting air. Problems evidenced by strong odours and/or lack of air movement. Windows and/or grilles open satisfactorily.

	Health, Safety and Environment WORKPLACE INSPECTION CHECKLIST	Attachment 021-3 NA Issue Date: June 1999 Revision 5: August 2010
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14. Kitchens	
Housekeeping	Kitchen area not being used for any other purpose than the preparation and consumption of food and drink, e.g. storage of cleaning materials.
	Kept clean and tidy.
Hygiene	No signs of infestation by insects or rodents.
	No signs of stale or rotten foodstuffs.
Appliances	Sharp kitchen implements suitably stored.
	All appliances in good working order.
15. General Cleanliness	
Building Fabric	Walls, floors, etc. clean and free from dust.
	Paint or plaster not flaking off walls or ceilings.
Furniture	Furniture clean and free from dust.
Windows	Windows not excessively dirty.
Tidiness	Corridors, fire escapes, electrical switch cupboards, etc. kept free of litter and are not used for storage.
Cleaning Materials	Suitable provision of cleaning chemicals and personal protective equipment, eg. gloves; cleaning chemicals are suitable stored.
16. Chemical Substances	
Storage and Labelling of Chemicals	Chemicals in secure, undamaged and clearly labelled containers.
	Chemicals stored so that they are not liable to fall or damage either themselves or other materials.
	Chemicals kept within locked cupboard/room if required.
17. Refuse Facilities	
Well Maintained	Bins and other refuse facilities in good state of repair.
Clean and Tidy	Waste facilities not overflowing.
	All refuse is being regularly collected.
	Area around waste facilities kept clean and tidy.
	Refuse bags/bins not presenting an obstruction or tripping hazard to the public or employees.
18. First Aid	
First Aid Box	First aid box fully stocked with listed items.
	First aid box contains guidance on the treatment of injured people.
	First aid box situated in the correct appointed location.
	Drugs, creams or ointments should not be available for use by employees, visitors or tenants (e.g. Aspirin).
First Aider/Appointed Person	At least one "appointed person" to be available during the designated working day times when people are at work, to administer first aid assistance and/or call an ambulance.
First Aid Notices	Check that first aid notices giving location of first aid box and name and location of appointed persons are up-to-date.
19. Access Roads and Car Parks	
Access and Egress	No obstructions to the safe and easy passage of vehicles throughout the property's traffic routes.
	All vehicle parking bays free from obstructions.
	In areas where vehicles and pedestrians circulate, the lines of sight available to both are not obscured.
	Gates/barriers in full working order and not presenting a risk to health and safety.
	Any fire escape route through a garage or car park not blocked by vehicles.
Signage	Signs directing traffic or pedestrians in place, visible, and, where possible to assess, being adhered to.
Cleanliness	Car-parking areas clean and tidy.

	Health, Safety and Environment WORKPLACE INSPECTION CHECKLIST	Attachment 021-3 NA Issue Date: June 1999 Revision 5: August 2010
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20. Lifts	
Lifts	Doors fully operational.
	No obvious signs of damage.
	Emergency phone operational.
	No unusual sounds when operating.
	Maintained in a clean condition and free from litter.
	Inspection Certificates
21. Display Screen Equipment (See also SMS 054 and Attachment 054-1)	
Lighting	Visual conditions for the task satisfactory, no glare from lights/sunlight, no shadowing and the screen easy to read.
Noise	Minimal nuisance from printers and heating/ventilation units
Posture	Operator able to adjust equipment in order to maintain good posture.
Furniture	Furniture and work equipment clean and in good repair.
Training and Information Packages	Information to be provided close to the workstation on the use of computer package(s), adjustment of display screen equipment and furniture, maintaining a good working posture.
Risk assessment	Completed by the main user and Office Safety Supervisor and satisfactory.
22. Systems of Work and Work Equipment	
Working Methods and Work Equipment	Safe working procedures established and being adhered to.
	Manufacturers instructions for the equipment used are being followed. Equipment working efficiently and in good repair.
	Appropriate protective clothing is being used, if necessary.
	Tools are properly stored when not in use, and safety carried especially when used at a height.
Permits to Work	In hazardous places/situations (eg. Roof work), permit to work system in place and being adhered to.
23. Water	
Little-used Outlets	Flush (run) any little-used hot and cold outlets for minimum of 3 minutes each month (5 minutes if very distant from storage).
Hot Water Supplies	Producing hot (>50°C) and not scalding (<65°C) water.
24. Electrical Installation	
Electrical Equipment	Working satisfactorily
	Undamaged in any way.
	All used in a proper and safe manner.
Wiring	No exposed wires or circuitry.
Installation	Tested every 5 years and certified by Competent Person
25. H&S Meetings/Notices	
Management Meetings	Attend Management Meetings at which H&S is discussed. The Meeting should discuss as a minimum: Updates to Safety Management System, Accidents/Incidents, Results of Audits, Corrective actions, Project-related H&S and any issues raised by the Office Safety Supervisor and Representative of Employee Safety.
H&S Committee Meetings	Attend H&S Committee Meetings and ensure record of meeting is made available to employees.
Meetings with Representative of Employee Safety (UK)	Meet monthly with the Representative of Employee Safety and record any items of concern.
Notices	All legally required notices such as H&S Law Poster (UK), H&S Committee Record, Insurance (UK), and URS material (4sight banner, Lessons Learned, etc.) on display.

**URS SAFETY MANAGEMENT STANDARD 024
MEDICAL SCREENING AND SURVEILLANCE**

URS SAFETY MANAGEMENT STANDARD

Medical Screening and Surveillance

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies for employees assigned to work environments where there is a potential for exposure to chemical, biological, and/or physical hazards.

Individuals will be selected for medical screening based on regulatory standards, project health and safety plan (HASP), assessments, the expected use of personal protective equipment (PPE), and client contract requirements.

2. Purpose and Scope

The purpose of this standard is to prevent occupational illness and injury by early identification of exposure-related health effects before they result in disease. Medical examinations will be performed to determine whether employees are capable of safely performing assigned tasks, to verify that protective equipment and controls are effectively providing protection, and to comply with government regulations. Included are provisions for emergency medical consultation and treatment.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

The Occupational Health Manager (OHM) is responsible for development and administration of this program in coordination with the URS Medical Service Provider (MSP). The OHM will maintain current injury and illness data, and participate with corporate, division, regional, country, or strategic business unit Health, Safety, and Environment (HSE) Managers in evaluation of this program. The MSP will provide occupational medicine oversight for the program and will approve medical surveillance protocols.

Locations in the United States and Canada will follow all requirements of this program.

International locations will follow sections B.1, 2, 3, 5, 6, 7, and 8; G.3; and H.1 of this program.

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4. Requirements

A. Selection of program participants

1. The Medical Surveillance Evaluation (MSE) form – Attachment 024-2 NA provides the primary guidance for determining whether medical screening is required for an employee and the frequency of periodic exams. The MSE is to be completed by the employee and his or her supervisor at the time of hire for any employee who may work outside an office environment. At each annual performance review, the MSE is to be reviewed for accuracy. Other reviews are required whenever there is a change in job tasks.
2. Additional site- or project-specific biological monitoring or toxicological screening may be required in addition to this program's scheduled core exams. These medical tests will be specified by the project-specific HASP and will be authorized by the MSP on the exam appointment protocol. Note: See Section D.2 if the employee will have an initial assignment at a HAZWOPER site.

B. Types of medical screening and surveillance exams

1. A baseline or preassignment baseline exam will be conducted prior to the start of work assignments requiring medical surveillance.
2. Periodic exam schedules are established by the MSP using the following criteria:
 - a. Employees performing the following types of work will receive annual exams: construction activities in the exclusion zone of HAZWOPER sites; field work activities in the exclusion zone of HAZWOPER sites for 30 or more days per year; or projects involving exposure to materials regulated by the Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) at or above established action levels.
 - b. Employees performing the following types of work will receive biennial exams: field work activities at HAZWOPER sites less than 30 days per year; waste disposal activities; non-HAZWOPER environmental sampling; or chemistry laboratory, pilot plant projects, or bench-scale operations for 30 or more days per year.

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3. Employees currently participating in an examination program will receive exit exams when they leave their work assignment as identified in the Exit Exam Determination – Attachment 024-6 NA. In the event an employee declines the exit exam, the employee will be requested to sign a Waiver of Exit Medical Surveillance Exam – Attachment 024-7 NA.
4. Department of Transportation (DOT) exams will be conducted biennially when an employee is assigned to drive a vehicle with a gross weight rating of more than 10,000 pounds or a placarded vehicle of any size used to transport hazardous chemicals. DOT exam certification can be added to a routine baseline or periodic exam protocol when scheduling with the MSP.
5. When noise levels in the employee's work environment equal or exceed an 8-hour time-weighted average of 85 decibels as measured on the A-scale (dBA), annual audiograms will be performed. For employees involved in construction activities or construction management, enrollment in this program will be required if more than 50% of their time is spent in an active construction area and working in an area with posted noise hazards.
6. Individual radiation dose monitoring will be conducted as required by the site-specific HASP with approval by a Radiation Safety Officer. Personal dosimetry (film badges) is typically required; however, depending on the specific radiation hazard, additional monitoring or scans may be required.
7. To determine an employee's ability to wear a respirator, a medical evaluation will be performed before an employee is fit tested or assigned to wear a respirator.
8. Employees assigned to work in environments with airborne concentrations of asbestos fibers at or above the established action level (OSHA, MSHA, state, or other applicable regulations) will receive asbestos-specific baseline and annual exams. Exit exams will be performed if an exam has not been performed within the previous 6 months or if an employee has medical complaints related to potential asbestos exposure.
9. Blood sampling and monitoring for lead and other heavy metals will be conducted every 6 months until two consecutive blood

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samples/analyses are acceptable. An employee with elevated heavy metal blood levels should be temporarily assigned to a task with minimal exposure, pending medical clearance. Sampling and monitoring will be performed every 2 weeks during the reassignment period. Employees will be notified of results within 5 days when levels are not acceptable. Medical Removal Protection benefits may apply in this situation.

10. Urine samples may be collected for some heavy metal exposures such as cadmium and mercury. Samples must be collected within 30 days of assignment to any task with potential for exposure to cadmium or other heavy metals. Medical monitoring results will be used to assess worker exposure and exposure control methods.
11. Medical monitoring will also be required to assess potential worker health risk to other chemical hazards, including polyaromatic hydrocarbons (PAHs), pesticides, benzene, chlorinated solvents, crystalline silica, and other chemical hazards as identified in prejob hazard analysis. The MSP will be consulted to determine necessary testing protocols and acceptance levels. The physician's opinion letter will be used to determine the worker's ability to perform the specified task and to wear PPE necessary to accomplish the task in a safe manner.
12. Skin exposures to hazardous chemicals with "Skin" notation will be evaluated case by case in consultation with the MSP. Allergic and hyper-sensitivity symptoms will be evaluated by the MSP as required.

C. Exam protocols

1. The Medical Screening and Surveillance Exam Protocol – Attachment 024-3 NA identifies the medical exam components of this program.
2. Evaluation will be confidential and provided during normal hours. Employees will be offered the opportunity to discuss the results of the evaluation with the MSP. All exam results are considered personal and confidential information, and will not be stored in any unsecured records not transmitted without the employee's permission.

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D. Scheduling of exams

1. The Office or Project Manager, usually with assistance from the local HSE Representative, is responsible for contacting the MSP when baseline, exit, and project-specific exams are required. The MSP maintains an employee scheduling database for tracking periodic exams and will contact the employee for scheduling during the month the exam is due. These steps are detailed in the Medical Surveillance Exam Process – Attachment 024-4 NA.
2. Employees hired with an initial assignment to work at a HAZWOPER site whose work duties require passing a physical exam or who have an essential job function of wearing a respirator will receive a job offer contingent upon passing a preassignment baseline exam. See HAZWOPER and Respirator Preassignment Baseline Exam Protocol – Attachment 024-5 NA.
3. In the event of an urgent business need, a temporary clearance to begin work the day of the exam may be requested at the time a baseline exam is scheduled through the MSP. The temporary clearance will be issued by the local physician and will be good for up to 14 days or until the MSP physician's final clearance is received, whichever comes first.
4. If an exam becomes due during an employee's pregnancy, it is advised to defer the exam until after delivery and the employee returns to work from family/medical leave status.

E. Exam Follow-Up

1. Following each exam, the MSP will issue a physician's written opinion (Health Status Medical Report), which will include any medical restrictions and address the employee's ability to use personal protective equipment, to the HSE Representative. See Exam Follow-Up Procedures – Attachment 024-8 NA.
2. The MSP will mail the exam invoice to the Local Office HSE Representative, who will either approve the charge and forward the invoice to the accounts payable department for payment or forward the charge to the manager responsible for the employee for charge assignment and payment. (Medical exams that are part of this program are provided to URS employees at no cost to the employee.)

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3. The MSP will mail a confidential letter detailing the results of the exam to the employee at his or her home address within 30 days of the exam date.

F. Emergency Medical Care

1. Preplanning is essential for a prompt and proper response to a medical emergency. Site-specific emergency procedures will be provided in the site HASP. Suggested preplanning actions are provided in SMS 065 – Injury Management. See Field First Aid Kit Supply List – Attachment 024-9 NA for recommended supplies. The contents of the first aid kit will be checked prior to being sent out to each site/project and periodically thereafter to ensure that the expended items are replaced.
2. A MSP occupational physician can be reached 24 hours a day for phone consultation at WorkCare™ (1-800-455-6155).
3. A workers' compensation claim should be filed by URS Occupational Health Nurses with Sedgwick CMS (1-866-566-1915) for an injured employee who receives professional medical care or who is disabled from working beyond the initial date of injury.
4. To comply with OSHA reporting regulations, the OHM or the applicable corporate, regional, country, or SBU HSE Manager should be notified immediately if there is a work-related hospitalization or death.

G. Medical Records

1. Medical records include records concerning an employee's health status that is made or maintained by a physician, nurse or other health care professional. Medical records are maintained and preserved in confidential, locked files in the custody of the MSP for at least the duration of employment plus 30 years. Only information regarding the employee's ability to perform the job assignment will be provided to company representatives.
2. Employees in medical monitoring programs are notified initially, and annually thereafter, of the existence, location and ability to access medical records maintained by the MSP. Upon request, each employee (or designated representative) will have access to the employee's medical record. Prior to the release of health information to the employee (or designated representative), a

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specific written consent must be signed by the employee. Records will be provided in a reasonable time and manner at no cost to the employee.

3. International records (excluding the United States and Canada) will be maintained in-country at the local clinic.
4. Projects that use local clinics or employer/client clinics may store records at that site, but at the termination of the project, all employee medical records must be transferred to long-term records retention or forwarded to WorkCare™.
5. Subcontractors and vendors are expected to maintain their own employee records and reports, but the employee physician's opinion letters will be available for inspection and verification of compliance.
6. If in the event, URS ceases operations, medical records will be transferred to the successor employer. If no successor employer is available, records will be transferred to the National Institute for Occupational Safety and Health.

H. Program evaluation

1. The OHM and corporate, regional, country, or SBU HSE Managers will evaluate this program annually and as needed. Issues to review include program efficacy and efficiency, employee satisfaction, and cost-effectiveness.
2. The MSP will prepare an Annual Medical Trending Report specifying the number and types of exams performed and anonymous statistical exam results in group data format.
3. Each employee is mailed a Post-Exam Evaluation by the MSP. Employee feedback regarding the clinic, medical staff, and exam procedures are reviewed, and corrective actions are identified and taken as needed.

5. Documentation Summary

The following documentation will be maintained in the office / project file:

- A. Medical Surveillance Evaluation.

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B. Health Status Medical Report.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Technical Links – [Medical Screening/Surveillance](#)
- B. [U.S. OSHA Publication 3162](#) – Screening and Surveillance: A Guide to OSHA Standards, 1999
- C. [SMS 065](#) – Injury Management
- D. [Attachment 024-1 NA](#) – WorkCare™ Medical History Questionnaire
- E. [Attachment 024-2 NA](#) – Medical Surveillance Evaluation
- F. [Attachment 024-3 NA](#) – Medical Screening and Surveillance Exam Protocol
- G. [Attachment 024-4 NA](#) – Medical Surveillance Exam Process
- H. [Attachment 024-5 NA](#) – HAZWOPER and Respirator Preassignment Baseline Exam Protocol
- I. [Attachment 024-6 NA](#) – Exit Exam Determination
- J. [Attachment 024-7 NA](#) – Waiver of Exit Medical Surveillance Exam
- K. [Attachment 024-8 NA](#) – Exam Follow-Up Procedures
- L. [Attachment 024-9 NA](#) – First Aid Kit Supply List

Medical History Questionnaire

- Baseline Annual/Biennial
 Exit Other

Employee Name: _____
Company Name: _____
Office: _____
Date: _____



Medical History Questionnaire

Your Instructions

- Location of your exam will be listed on your Appointment Protocol.
- Please have your Supervisor or Health & Safety Professional complete the Job Profile on the inside flap of this page if you do not know the responses.
- See your Supervisor or Health & Safety Professional for directions to the clinic. Please bring the completed exam packet and your Appointment Protocol.
- If lab work is ordered, do not eat for 8 hours prior to exam. (Water and unsweetened juice or black decaffeinated coffee is allowed. Dry toast if you have an afternoon appointment.)
- Avoid all alcohol consumption for 24 hours prior to the exam.
- Avoid loud noise exposure for 14 to 16 hours before the exam.
- If you wear contact lenses, please do not insert them on the day of the exam. Bring a pair of glasses.
- If you use hearing aids, please bring them to the clinic.
- Your employer is responsible for the cost of this exam. It is important to be on time for your appointment.
- If you cannot attend your appointment, please call (800) 455-6155 to cancel, or your employer may be charged.

**Please answer all the questions in this booklet.
If you have any questions, please call 1-800-455-6155.**

Making Health Count

I. Instructions

Your supervisor must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the healthcare professional who will review it.

Has your employer told you how to contact the healthcare professional who will review this questionnaire? Yes No

This questionnaire is used to gather information about your health and physical condition, both now and in the past. This information will be used to determine if you can safely perform the duties of your job. This exam is not intended to substitute for care provided by your personal physician. Results of the exam will be sent to your home address. The results of the examination are kept confidential.

Print the following information:

Last Name: _____ First Name: _____

Home Mailing Address: _____

City: _____ State: _____ Zip: _____

Email Address: _____ Social Security # : _____

Sex: Male Female Date of Birth: _____ Age: _____

Race: Hispanic or Latino White Asian Black or African American

American Indian or Alaska Native Native Hawaiian or Other Pacific Islander

Two or More Races (Not Hispanic or Latino)

Position: _____ Site Location: _____ Date Employed: _____

What is the phone number (including area code) at which you can be reached by the healthcare professional who reviews this questionnaire? _____

What is the best time to reach you? From: _____ AM PM To: _____ AM PM

Read and sign this Consent for Release of Medical Records:

I hereby authorize **WorkCare** to release in confidence to _____ (company) and/or its subsidiaries medical information, including but not limited to the results of medical evaluations, physical examinations or medical testing, as it specifically pertains to my medical qualification to perform the stated Job Duty consistent with the applicable requirements of OSHA, MSHA. I further authorize the examining physician and/or clinic to release to WorkCare any medical information related to my medical or physical condition. You have a right to receive a copy of this authorization.

Signature: _____ Date: _____

II. Complete This Entire Section

Job Profile

If you have questions regarding this Job Profile, please discuss with your supervisor in order to complete this section.

Job Duty/Title:

Indicate your job title: _____

(Example: Driller, Engineer, Environmental Scientist, etc.)

Indicate your job duty: _____

Indicate the time you spend in each area:

Field _____ % Office _____ % Travel _____ %

Physical Requirements:

Are there any specific physical demands of the job that are important? (Examples: Lifting, carrying)

If yes, please describe: _____

Yes No

Protective Equipment:

Is clearance for the use of respiratory equipment needed?

Escape only (no rescue) Emergency rescue only

Is there specific safety equipment (beyond hard hat, gloves, boots, and appropriate clothing) that is used in the safe performance of this job?

If yes, please describe: _____

Yes No
 Yes No

1. **Please Check the Following Types of Respiratory Protective Equipment Used**

✓		Duration	Frequency	Temperature Extremes	Humidity
<input type="checkbox"/>	Half Face Piece Air Purifying Respirator				
<input type="checkbox"/>	Full Face Piece Air Purifying Respirator				
<input type="checkbox"/>	Powered Air Purifying Respirator				
<input type="checkbox"/>	Self-Contained Breathing Apparatus				
<input type="checkbox"/>	Air Line Respirator				

2. Is it possible that you will be required to wear Level A protection at any time? (SCBA, fully encapsulated suit, chemical resistant gloves & boots.)

Yes No

3. Is it possible that you will be required to wear Level B protection at any time? (SCBA, chemical resistant clothing, chemical resistant gloves & boots.)

Yes No

4. Describe significant potential chemical exposures: _____

5. Will you be working under hot conditions (temperatures exceeding 77°F)?

Will you be working under humid conditions?

Will you be working at high altitudes?

Describe the work you'll be doing while you're using your respirator(s):

Yes No
 Yes No
 Yes No

6. Describe any special or hazardous conditions you might encounter when you're using your respirator(s). (For example, confined spaces, life-threatening gases):

7. During the period in which you use the respirator(s), is your work effort:

a. Light (less than 200 kcal per hour) *Example: Sitting while mailing or filing; performing light assembly work, etc.*

Hours per shift: _____

Yes No

b. Moderate (200 to 350 kcal per hour) *Example: Transferring a moderate load (about 35 lbs.) at trunk level; pushing a wheel barrel with a heavy load, etc.*

Hours per shift: _____

Yes No

c. Heavy (above 350 kcal per hour) *Example: Lifting a heavy load (about 50 lbs.) from the floor to your waist; shoveling, etc.*

Hours per shift: _____

Yes No

8. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (e.g. rescue, security):

9. Are there any substances that you cannot work with?

Describe: _____

Yes No

III.

Review of Systems

Answer "Yes" if you currently have any of these symptoms/conditions and/or have had them significantly in the past. List date when first occurred.

		Yes	No	Date
1.	A. Fever	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Chills	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Weight loss	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Loss of energy/fatigue	<input type="checkbox"/>	<input type="checkbox"/>	
2.	A. Poor vision	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Color blindness	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Double vision	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Eye injury	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Cataract	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Glaucoma	<input type="checkbox"/>	<input type="checkbox"/>	
	G. Do you wear glasses or contacts?	<input type="checkbox"/>	<input type="checkbox"/>	
3.	A. Ear infection	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Mastoid surgery	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Hearing loss	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Sore throat	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Frequent hoarseness	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Dental problems	<input type="checkbox"/>	<input type="checkbox"/>	
4.	A. Allergies	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Sinus trouble	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Hay fever	<input type="checkbox"/>	<input type="checkbox"/>	
5.	A. Tuberculosis	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Asthma & breathing difficulties	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Lung collapse	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Shortness of breath	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Persistent or severe colds	<input type="checkbox"/>	<input type="checkbox"/>	
	G. Persistent or severe coughs	<input type="checkbox"/>	<input type="checkbox"/>	
	H. Chest surgery	<input type="checkbox"/>	<input type="checkbox"/>	
	I. Wheezing	<input type="checkbox"/>	<input type="checkbox"/>	
	J. Emphysema	<input type="checkbox"/>	<input type="checkbox"/>	
	K. Bronchitis	<input type="checkbox"/>	<input type="checkbox"/>	
6.	A. High blood pressure	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Heart murmur	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Enlarged heart	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Heart disease/failure	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Rheumatic fever	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Heart palpitations	<input type="checkbox"/>	<input type="checkbox"/>	
	G. Irregular heart beat	<input type="checkbox"/>	<input type="checkbox"/>	
	H. Heart attack	<input type="checkbox"/>	<input type="checkbox"/>	
	I. Chest pain	<input type="checkbox"/>	<input type="checkbox"/>	
7.	A. Varicose veins	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Stroke	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Leg ulcers	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Swelling of ankles	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Leg pain when walking	<input type="checkbox"/>	<input type="checkbox"/>	
8.	A. Anemia	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Leukemia	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Sickle cell disease	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Other blood disease	<input type="checkbox"/>	<input type="checkbox"/>	
9.	A. Diabetes	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Thyroid problems	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Cancer or tumors	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Heat related illness	<input type="checkbox"/>	<input type="checkbox"/>	
10.	A. Rash/dermatitis	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Bruise easily	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Psoriasis	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Wart/mole change	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Eczema/Acne	<input type="checkbox"/>	<input type="checkbox"/>	

		Yes	No	Date
11.	A. Headaches	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Head injury	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Neck Injury	<input type="checkbox"/>	<input type="checkbox"/>	
12.	A. Birth defect	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Frequent backaches	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Back surgery	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Disc disease	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Back injury or strain	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Back x-rays	<input type="checkbox"/>	<input type="checkbox"/>	
	G. Chiropractic treatments	<input type="checkbox"/>	<input type="checkbox"/>	
	H. Arthritis/Rheumatism	<input type="checkbox"/>	<input type="checkbox"/>	
	I. Knee problems	<input type="checkbox"/>	<input type="checkbox"/>	
	J. Swollen joints	<input type="checkbox"/>	<input type="checkbox"/>	
	K. Amputation	<input type="checkbox"/>	<input type="checkbox"/>	
13.	L. Broken Bones Type:	<input type="checkbox"/>	<input type="checkbox"/>	
	M. Dislocations	<input type="checkbox"/>	<input type="checkbox"/>	
	N. Carpal tunnel syndrome	<input type="checkbox"/>	<input type="checkbox"/>	
	O. Repetitive strain extremities	<input type="checkbox"/>	<input type="checkbox"/>	
	A. Ulcers	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Colitis	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Diarrhea (frequent)	<input type="checkbox"/>	<input type="checkbox"/>	
14.	D. Stomach problems	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Vomiting	<input type="checkbox"/>	<input type="checkbox"/>	
	F. Bloody bowel movements	<input type="checkbox"/>	<input type="checkbox"/>	
	G. Hepatitis/Abdominal liver enzymes	<input type="checkbox"/>	<input type="checkbox"/>	
	H. Cirrhosis	<input type="checkbox"/>	<input type="checkbox"/>	
	I. Yellow jaundice	<input type="checkbox"/>	<input type="checkbox"/>	
	J. Gallbladder trouble	<input type="checkbox"/>	<input type="checkbox"/>	
	A. Epilepsy/seizures	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Fainting spells	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Loss of consciousness	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Dizziness or vertigo	<input type="checkbox"/>	<input type="checkbox"/>	
E. Frequent exhaustion	<input type="checkbox"/>	<input type="checkbox"/>		
F. Trouble with nerves	<input type="checkbox"/>	<input type="checkbox"/>		
G. Frequent worry/depression	<input type="checkbox"/>	<input type="checkbox"/>		
15.	A. Kidney trouble/stones	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Bladder trouble	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Kidney/bladder surgery	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Blood in urine	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Difficulty urinating	<input type="checkbox"/>	<input type="checkbox"/>	
16.	A. Venereal disease	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Infertility/difficulty conceiving	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Children with birth defects	<input type="checkbox"/>	<input type="checkbox"/>	
17. Female	A. Irregular period/painful menstruation	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Hysterectomy	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Are you pregnant?	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Difficulty becoming pregnant	<input type="checkbox"/>	<input type="checkbox"/>	
	E. Date of last menstrual period	Date:		
	F. Date of last pelvic/pap smear	Date:		
	G. Date of last mammogram	Date:		
	H. Breast lumps	<input type="checkbox"/>	<input type="checkbox"/>	
	I. Breast discharge	<input type="checkbox"/>	<input type="checkbox"/>	
	J. Repeated miscarriages	<input type="checkbox"/>	<input type="checkbox"/>	
18. Male	A. Inability to have an erection	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Discharge or bleeding from the penis	<input type="checkbox"/>	<input type="checkbox"/>	
	C. Abnormal testicular self examination	<input type="checkbox"/>	<input type="checkbox"/>	
	D. Prostate problems	<input type="checkbox"/>	<input type="checkbox"/>	

Describe any "Yes" responses by number: _____

Are you currently unable to perform any type of activity? Yes No Describe: _____

III.**Social History****Yes No**

1. Do you now or in the past month ever smoked cigarettes? Yes No
2. Have you ever smoked cigarettes in the past? Yes No
3. If you now smoke or have smoked in the past, how many years total have you smoked? _____
4. If you now smoke or have smoked in the past, how many packs/day do/did you smoke on average?

<input type="checkbox"/> Less than one-half	<input type="checkbox"/> Two	<input type="checkbox"/> Three
<input type="checkbox"/> One	<input type="checkbox"/> Two and one-half	<input type="checkbox"/> More than three
<input type="checkbox"/> One and one-half		
5. Do you use any one of the following tobacco products?

<input type="checkbox"/> Pipe tobacco	<input type="checkbox"/> Snuff	<input type="checkbox"/> None
<input type="checkbox"/> Smokeless tobacco	<input type="checkbox"/> Cigars	
6. Do you regularly drink alcoholic beverages? Yes No
7. If yes, how many drinks, beers or glasses of wines do you drink daily?

<input type="checkbox"/> Less than 1	<input type="checkbox"/> 3-4	<input type="checkbox"/> 7-8
<input type="checkbox"/> 1-2	<input type="checkbox"/> 5-6	<input type="checkbox"/> More than 8
8. Do you exercise strenuously for at least 45 min.?

<input type="checkbox"/> Daily	<input type="checkbox"/> 1 time a week	<input type="checkbox"/> Never
<input type="checkbox"/> 3 times a week	<input type="checkbox"/> Rarely	
9. Do you feel frustrated, stressed or uptight?

<input type="checkbox"/> Daily	<input type="checkbox"/> 1 time a week	<input type="checkbox"/> Never
<input type="checkbox"/> 3 times a week	<input type="checkbox"/> Rarely	
10. Do you eat greasy or fatty foods?

<input type="checkbox"/> Daily	<input type="checkbox"/> 1 time a week	<input type="checkbox"/> Never
<input type="checkbox"/> 3 times a week	<input type="checkbox"/> Rarely	

V.**Past Medical History****For Annual or Exit Exam – Indicate if There Has Been a Change Since Last Exam**

1. Are you currently being treated for illness or injury? Yes No
2. Have you been treated for persistent illness or injury? Yes No
3. Describe any "yes" responses: _____
4. Please list hospital admissions: If none, check here

Year	Reason for Hospitalization
_____	_____
_____	_____
_____	_____
5. Please list allergies to any medication, food, clothing, bee stings or other substances: _____
6. How many days of work did you miss in the last 12 months due to your health? _____
7. Have you ever pursued a compensation claim or received disability payment for an occupational injury or disease? Yes No
8. Have you ever been turned down for life insurance? Yes No
9. Have you ever had injuries from an auto accident? Yes No

VI. Current Medications

Fill out the following questions for any exam type.

When was your last tetanus immunization booster? Month: _____ Year: _____

Do you currently have prescriptions for drugs or medications? Yes No

Have you ever been addicted to drugs? Yes No

Describe: _____

Have you ever abused prescription medication? Yes No

Describe: _____

Do you take any of the following medications regularly?

Heart medicine	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Aspirin	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Thyroid medicine	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Blood pressure medicine	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Oral medicine for diabetes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Diuretic (Water pill)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Insulin for diabetes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Medicine for seizures	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Nerve or sleeping pill	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Allergy/Asthma medications	<input type="checkbox"/> Yes	<input type="checkbox"/> No

VII. Family History

Fill out the following questions for any exam type. Indicate change since last exam.

Father: Living List Diseases: _____ If deceased, cause of death: _____

Mother: Living List Diseases: _____ If deceased, cause of death: _____

Brother: Living List Diseases: _____ If deceased, cause of death: _____

Sister: Living List Diseases: _____ If deceased, cause of death: _____

Has any member of your immediate family had any of the following?

Cancer	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Diabetes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Nervousness	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Mental Illness	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Tuberculosis	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Rheumatism	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Kidney Disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Heart Disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No			

Continue to Next Section on
Following Page ►

This Page is to Be Completed Only As Initial or Post Offer Exams

VIII. Past Job History

List All Jobs Ever Held Starting With Your First – Include Part Time And Volunteer Work

Name Of Employer	From Mo/Yr	To Mo/Yr	# Hrs Worked Per Week/Shift	Description of Work	Potential Hazards <small>(Dust, Fumes, Chemicals, Heat, Noise, Physical Agents, Metals, Radiation)</small>

IX. Toxic Exposure History

At work or at home, have you ever been significantly exposed to hazardous solvents, hazardous airborne chemicals (e.g. gases, fumes, dust) or have you had significant skin contact with hazardous chemicals?

Yes No

Describe: _____

Have you worked with any of the materials, or under any of the conditions, listed below:

	Yes	No
Asbestos	<input type="checkbox"/>	<input type="checkbox"/>
Silica (e.g. sandblasting)	<input type="checkbox"/>	<input type="checkbox"/>
Coal (e.g. mining)	<input type="checkbox"/>	<input type="checkbox"/>
Grinding	<input type="checkbox"/>	<input type="checkbox"/>
Welding	<input type="checkbox"/>	<input type="checkbox"/>
Asphalt, pitch or tar	<input type="checkbox"/>	<input type="checkbox"/>
Beryllium	<input type="checkbox"/>	<input type="checkbox"/>
Cadmium	<input type="checkbox"/>	<input type="checkbox"/>
Cotton Dust	<input type="checkbox"/>	<input type="checkbox"/>
Pesticides	<input type="checkbox"/>	<input type="checkbox"/>
Fuel	<input type="checkbox"/>	<input type="checkbox"/>
Oils	<input type="checkbox"/>	<input type="checkbox"/>
Lead	<input type="checkbox"/>	<input type="checkbox"/>
Nickel/Chrome	<input type="checkbox"/>	<input type="checkbox"/>
Paint	<input type="checkbox"/>	<input type="checkbox"/>
Microwave/Radio Frequency	<input type="checkbox"/>	<input type="checkbox"/>
Nuclear Radiation/X-Ray	<input type="checkbox"/>	<input type="checkbox"/>
Fiberglass	<input type="checkbox"/>	<input type="checkbox"/>
Plastics	<input type="checkbox"/>	<input type="checkbox"/>
Solvents	<input type="checkbox"/>	<input type="checkbox"/>
Compressed Gases	<input type="checkbox"/>	<input type="checkbox"/>
Aluminum	<input type="checkbox"/>	<input type="checkbox"/>
Iron	<input type="checkbox"/>	<input type="checkbox"/>
Tin	<input type="checkbox"/>	<input type="checkbox"/>
Dusty Environments	<input type="checkbox"/>	<input type="checkbox"/>

Have you ever worked around excessive noise?

Yes No

Where: _____

Have you ever worked in an excessive hot or cold environment? Yes No

Where: _____

Have you ever worked around vibration or with vibrating tools? Yes No

Have you ever worked in a doctor's office, clinic or hospital where you might have had exposure to biohazardous materials? Yes No

Have you ever performed a site assessment on any of the potential hazards listed above in Past Job History? Yes No

Describe: _____

Any other hazardous exposures? Yes No

If yes, describe these exposures: _____

Have you ever lived near a large industrial plant or in areas of excessive air pollution?

Yes No

Have you ever been in the military service? Yes No

If yes, were you exposed to biological or chemical agents (either in training or in combat)? Yes No

Have you ever worked on a HAZMAT team? Yes No

List any second jobs or side businesses you have:

List your current and previous hobbies:

Respirator Users Only

**The following two pages only need to be completed by those assigned to use respirators.
If uncertain about respirator use, please complete.**

Respirator Use

	Yes	No
1. Have you ever worn a respirator in the past?	<input type="checkbox"/>	<input type="checkbox"/>
2. If no, go to Question #4.		
If yes, what type of respirator did you wear:		
<input type="checkbox"/> Disposable particulate filter mask (non-cartridge dust mask)		
<input type="checkbox"/> Half face air purifying respirator		
<input type="checkbox"/> Full face air purifying respirator		
<input type="checkbox"/> Powered air purifying respirator		
<input type="checkbox"/> Supplied air (airline) respirator		
<input type="checkbox"/> Self contained breathing apparatus (SCBA)		
<input type="checkbox"/> Escape only respirator		
3. If you've ever used a respirator, have you ever had any of the following problems:		
Eye irritation	<input type="checkbox"/>	<input type="checkbox"/>
Skin allergies or rashes	<input type="checkbox"/>	<input type="checkbox"/>
Anxiety	<input type="checkbox"/>	<input type="checkbox"/>
General weakness or fatigue	<input type="checkbox"/>	<input type="checkbox"/>
Any other problem or difficulty that interfered with your use of a respirator	<input type="checkbox"/>	<input type="checkbox"/>
Describe: _____		

Heart, Lungs and Other Body Systems

	Yes	No
4. Have you ever had an abnormal EKG (Electrocardiogram)	<input type="checkbox"/>	<input type="checkbox"/>
Describe: _____		
5. Have you ever had or currently have any of the following cardiovascular or heart problems:		
Heart attack	<input type="checkbox"/>	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	<input type="checkbox"/>
Angina (chest pain)	<input type="checkbox"/>	<input type="checkbox"/>
Heart failure	<input type="checkbox"/>	<input type="checkbox"/>
High blood pressure	<input type="checkbox"/>	<input type="checkbox"/>
Heart arrhythmia	<input type="checkbox"/>	<input type="checkbox"/>
Swelling in your legs or feet (not caused by standing or walking)	<input type="checkbox"/>	<input type="checkbox"/>
Any other heart problem that you have been told about	<input type="checkbox"/>	<input type="checkbox"/>

Heart, Lungs and Other Body Systems (cont.)

	Yes	No
6. Have you ever had surgery of the arteries, coronary bypass or angioplasty? If yes:	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Within the past year		
<input type="checkbox"/> More than one year ago		
7. Have you ever had or currently have any of the following pulmonary or lung problems:		
Asbestosis	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>
Chronic bronchitis	<input type="checkbox"/>	<input type="checkbox"/>
Emphysema	<input type="checkbox"/>	<input type="checkbox"/>
Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>
Tuberculosis	<input type="checkbox"/>	<input type="checkbox"/>
Silicosis	<input type="checkbox"/>	<input type="checkbox"/>
Lung cancer	<input type="checkbox"/>	<input type="checkbox"/>
Broken ribs	<input type="checkbox"/>	<input type="checkbox"/>
Pneumothorax (collapsed lung)	<input type="checkbox"/>	<input type="checkbox"/>
Any chest injuries or surgeries	<input type="checkbox"/>	<input type="checkbox"/>
8. Have you <u>ever</u> had seizures (fits)?	<input type="checkbox"/>	<input type="checkbox"/>
9. Have you <u>ever</u> been told you had diabetes (sugar disease)?	<input type="checkbox"/>	<input type="checkbox"/>
10. Have you <u>ever</u> had allergic reactions that interfere with your breathing?	<input type="checkbox"/>	<input type="checkbox"/>
11. Have you <u>ever</u> experienced claustrophobia (fear of closed-in spaces)?	<input type="checkbox"/>	<input type="checkbox"/>
12. Have you <u>ever</u> had trouble smelling odors?	<input type="checkbox"/>	<input type="checkbox"/>
13. Have you <u>ever</u> had or currently have any of the following pulmonary, cardiovascular, lung or heart symptoms?		
Shortness of breath	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath when walking on level ground or walking up a slight hill or incline	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath when walking with other people at an ordinary pace on level ground	<input type="checkbox"/>	<input type="checkbox"/>
Have to stop for breath when walking at your own pace on level ground	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath when washing or dressing yourself	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath that interferes with your job	<input type="checkbox"/>	<input type="checkbox"/>

Heart, Lungs and Other Body Systems (cont.)

- | | Yes | No |
|---|--------------------------|--------------------------|
| 14. Do you <u>currently</u> take medication for any of the following problems: | | |
| Breathing | <input type="checkbox"/> | <input type="checkbox"/> |
| Heart trouble | <input type="checkbox"/> | <input type="checkbox"/> |
| Blood pressure | <input type="checkbox"/> | <input type="checkbox"/> |
| Seizures (fits) | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Have you had or currently have any of the following symptoms of lung illness: | | |
| Coughing that produces phlegm (thick sputum) | <input type="checkbox"/> | <input type="checkbox"/> |
| Coughing that occurs when you are lying down | <input type="checkbox"/> | <input type="checkbox"/> |
| Coughing up blood in the last month | <input type="checkbox"/> | <input type="checkbox"/> |
| Wheezing | <input type="checkbox"/> | <input type="checkbox"/> |
| Wheezing that interferes with your job | <input type="checkbox"/> | <input type="checkbox"/> |
| Chest pain when you breath deeply | <input type="checkbox"/> | <input type="checkbox"/> |
| Coughing that wakes you early in the morning | <input type="checkbox"/> | <input type="checkbox"/> |
| Any other symptoms that you think may be related to lung problems | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Have you ever had any of the following cardiovascular or heart symptoms: | | |
| Frequent pain or tightness in your chest | <input type="checkbox"/> | <input type="checkbox"/> |
| Pain or tightness in your chest during physical activity | <input type="checkbox"/> | <input type="checkbox"/> |
| Pain or tightness in your chest that interferes with your job | <input type="checkbox"/> | <input type="checkbox"/> |
| In the past two years, have you noticed your heart skipping or missing a beat? | <input type="checkbox"/> | <input type="checkbox"/> |
| Heartburn or indigestion that is not related to eating | <input type="checkbox"/> | <input type="checkbox"/> |
| Any other symptoms that you think might be related to heart or circulation problems | <input type="checkbox"/> | <input type="checkbox"/> |

Full Face or SCBA Respirator User Only

Answer the following questions if you have been selected to use either a full-face piece respirator or Self-Contained Breathing Apparatus [SCBA].

- | | Yes | No |
|---|--------------------------|--------------------------|
| 17. Have you ever lost vision in either eye (temporarily or permanently)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Do you currently have any of the following vision problems? | | |
| Wear contact lenses | <input type="checkbox"/> | <input type="checkbox"/> |
| Wear glasses | <input type="checkbox"/> | <input type="checkbox"/> |
| Color blind | <input type="checkbox"/> | <input type="checkbox"/> |
| Any other eye or vision problem | <input type="checkbox"/> | <input type="checkbox"/> |

Full Face or SCBA Respirator User Only (cont.)

- | | Yes | No |
|---|--------------------------|--------------------------|
| 19. Have you ever had an injury to your ears, including a broken eardrum? | <input type="checkbox"/> | <input type="checkbox"/> |
| 20. Do you currently have any of the following hearing problems: | | |
| Difficulty hearing | <input type="checkbox"/> | <input type="checkbox"/> |
| Wearing a hearing aid | <input type="checkbox"/> | <input type="checkbox"/> |
| Any other hearing or ear problem | <input type="checkbox"/> | <input type="checkbox"/> |
| Describe fully: _____ | | |
| _____ | | |
| _____ | | |
| 21. Have you ever had a back injury? | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Do you currently have any of the following muscle or skeletal problems: | | |
| Weakness in any of your arms, hands, legs or feet | <input type="checkbox"/> | <input type="checkbox"/> |
| Back pain | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty moving your arms and legs | <input type="checkbox"/> | <input type="checkbox"/> |
| Pain or stiffness when you lean forward or backward at the waist | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty moving your head up and down | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty moving your head side to side | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty bending at your knees | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty squatting to the ground | <input type="checkbox"/> | <input type="checkbox"/> |
| Difficulty climbing a flight of stairs or a ladder while carrying more than 25 lbs. | <input type="checkbox"/> | <input type="checkbox"/> |
| Any other muscle or skeletal problems that might interfere with using a respirator? | <input type="checkbox"/> | <input type="checkbox"/> |
| Describe fully: _____ | | |
| _____ | | |
| _____ | | |

Continue to Next Section on Following Page ►

X.**For Yearly/Exit Examinations Only**

- 1a. Approximately how many days of hazardous fieldwork have you performed since your last exam? _____
- 1b. Approximately how many days in Level C (using an air-purifying respirator)? _____
- 1c. Approximately how many days in Level B (self-contained breathing apparatus or air line)? _____
2. Approximately how many different hazardous material sites have you worked on since your last examination? _____
3. What were the chemical or other hazards of concern to which you had or currently have significant potential exposure since your last examination? List chemicals of concern in table below.

Chemicals of Concern	Approximate # of Days	Exposure Frequency			Exposure Duration		
		Daily	Weekly	Monthly	<1 Hr.	1-8 Hr.	> 8 Hrs.

4. Since your last exam, have you had difficulty doing your job, because of:
- a. Sensitivity to chemicals, dust, sunlight, etc.? Yes No Don't Know
- b. Inability to perform certain motions? Yes No Don't Know
- c. Inability to assume certain positions? Yes No Don't Know
- d. Heat stress? Yes No Don't Know
- e. Other medical reasons? Yes No Don't Know
5. Have you experienced any health symptoms that may be related to exposures to hazardous materials since your last examination? If so, please describe: _____
-
6. Since your last examination, have you had any type of illness that resulted in more than 3 consecutive days lost time from work? Yes No
- Describe: _____
7. Do you feel that you have and/or had exposure to ticks? Yes No When: _____
- How would you quantify the exposure: Very significant Significant Insignificant None Unknown
8. Have you ever had any symptoms or signs (e.g. rash) which you attribute to tick bites? Yes No
- If yes, please describe: _____
- 9a. How would you rate the effectiveness of the health and safety procedures used for work? (Check only one.)
- Poor Fair Good Excellent
- 9b. Comments: _____
10. Have you ever had an illness, condition or symptom which:
- Occurred only during work? Yes No
- Occurred only after work, in evening? Yes No
- Occurred when you begin work after a weekend or holiday? Yes No
- Disappeared during vacations or weekends? Yes No
11. Have you ever developed an illness or symptoms that you think were related to work? Yes No
12. Have you ever worked with a substance that made your nose, chest or sinuses congested? Yes No
13. Have you ever worked with substances that irritated your skin or caused a rash? Yes No

STOP! Physicians Complete the Remaining Sections.

Physical Examination and Supporting Studies

(Please initial on Authorization Form when completed.)

Height _____ Inches
 Weight _____ lbs.
 Temperature _____ °
 Blood Pressure _____ / _____

Pulse (Resting)
 _____ / min.

For DOT only: Pulse immediately after 2 min. exercise: _____

Vision

Visual acuity: If applicant wears glasses, test and record both with and without glasses.

Near	Left	Right	Both		Color Vision	
Corrected	20/____	20/____	20/____		Normal	<input type="checkbox"/>
Uncorrected	20/____	20/____	20/____		Abnormal	<input type="checkbox"/>
					Can recognize red & green	<input type="checkbox"/>
Far	Left	Right	Both		Peripheral Vision	
Corrected	20/____	20/____	20/____		Normal	<input type="checkbox"/>
Uncorrected	20/____	20/____	20/____		Abnormal	<input type="checkbox"/>

Urinalysis

Specified Gravity: _____
 Albumin: _____
 Female LMP: _____
 Sugar: _____
 Blood: _____

Audiogram (If marked yes on Exam Checklist.)

	500	1000	2000	3000	4000	6000	8000
Right:	_____	_____	_____	_____	_____	_____	_____
Left:	_____	_____	_____	_____	_____	_____	_____

(Note: Testing documentation must be forwarded to WorkCare.)

Spirometry (If marked yes on Exam Checklist.)

FVC _____ Observed Vol.
 FEV₁ _____ Observed Vol.
 $\frac{FEV_1}{FVC}$ _____ %

FVC _____ Predicted % _____
 FEV₁ _____ Predicted % _____

(Note: Testing documentation must be forwarded to WorkCare.)

EKG (If marked yes on Exam Checklist.)

Normal
 Abnormal

(Note: All EKG strips must be forwarded to WorkCare.)

Chest X-Ray (If marked yes on Exam Checklist.)

Normal
 Abnormal

Comments: _____

Specimen Collection Per Exam Checklist

All laboratory specimens must be shipped by the day of the exam! If this is a Friday exam, mark air bill for Saturday delivery. Exam data should be included for shipment in the box with the laboratory specimens.

Medical Examination

Checklist	Normal	Abnormal	Detailed Description of Abnormal Findings
Hands / Skin Hair Skin Color / Texture Nails	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Head / Eyes / Nose / Throat / Mouth Configuration Lids / Conj / Sclera Pupils / Fundi / EOM Nasal Septum / Mucosa Teeth / Gums / Tongue / Palate	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Nervous System Central Motor Sensory Cerebellar Reflexes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Neck / Nodes Bruit ROM Muscle Strength Thyroid Cervical Nodes Inguinal / Axillary Nodes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Chest / Lungs Shapes / Symmetry Diaphragmatic Excursion Percussion Auscultation	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Cardiovascular Carotids Neck Veins / Pulses Heart Sounds (Murmurs) Heart Size	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Gastro / Intestinal Liver Spleen Masses Tenderness Scars Hernia	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Musculoskeletal / Extremities Spinal Alignment Extremities (Edema, Varicosities) Joints ROM	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Comments:			
Examining Physician (Print):	Physician Signature:	Date:	

Summary of Findings and Comments Relevant to Abnormal Conditions

Signature of Licensed Examining Physician: _____

Printed Name: _____ Phone: (____) _____

Summary of Findings and Comments Relevant to Abnormal Conditions

1. The results of the required testing should be recorded on page 11.
2. Please be sure to note EKG and chest x-ray readings on **Normal** or **Abnormal** on page 11, if required for this exam.
3. Please review any **Yes** answers **ONLY** for questions on pages 4, 5, 7, 8 and 9 of this booklet. You are not required to review the other history questions.
4. Your physical examination findings should be recorded on page 12 and 13.
5. The booklet and any specimens must be shipped to our laboratory **THE DAY OF THE EXAM.**

**Please answer all the questions in this booklet.
If you have any questions, please call 1-800-455-6155.**





Health, Safety and Environment
MEDICAL SURVEILLANCE
EVALUATION

Attachment 024-2 NA

Issue Date: February 2001
Revision 8: January 2011

This information will be used to determine routine medical screening exams for employees who work outside of an office setting. In addition, site-specific health and safety plans may specify project-related medical surveillance for regulated substances.

Please answer each entry:

Date: _____

Name: _____

Phone #: _____

Employee #: _____

Job Title: _____

Location: _____

Business: _____

Region/Business Unit: _____

Supervisor: _____

HSE Representative: _____

Choose One:

- New employee Current employee with job change
- Transfer from _____ OFFICE

The following questions assess federally mandated medical screenings and surveillance requirements:

Respirator	<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your job require you to wear a respirator or to be certified for respirator use? If yes, how many days per year? <input type="checkbox"/> 1-29 <input type="checkbox"/> 30+
Hearing	<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your job require you to wear hearing protection because you: a) Work in an environment where noise levels equal or exceed an 8-hour time-weighted average of 85 decibels? b) Perform construction activities or construction management around heavy equipment on a construction project more than 50 percent of the time?
Asbestos	<input type="checkbox"/> Yes <input type="checkbox"/> No	Do you perform intrusive work with asbestos (i.e., sampling, demolition, etc.)?



Health, Safety and Environment
MEDICAL SURVEILLANCE
EVALUATION

Attachment 024-2 NA

Issue Date: February 2001
Revision 8: January 2011

Lead	<input type="checkbox"/> Yes <input type="checkbox"/> No	Are you currently performing construction work where you may be exposed to airborne lead concentration at or above the OSHA action level or are you currently in a job that requires you to be in a medical surveillance program for lead (i.e., removal of lead-based paint or other demolition activities)?
Radiation	<input type="checkbox"/> Yes <input type="checkbox"/> No	Are you classified as a radiation worker?
DOT Driver	<input type="checkbox"/> Yes <input type="checkbox"/> No	Do you drive a truck with a gross vehicle weight rating of 10,000 pounds or more during company trips?
Diving	<input type="checkbox"/> Yes <input type="checkbox"/> No	Do you perform diving activities?
Biohazard	<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your job require work with bloodborne pathogens?
Remediation	<input type="checkbox"/> Yes <input type="checkbox"/> No	Do you perform remediation construction activities, field construction sampling, or supervision activities at hazardous waste remediation sites or hazardous waste treatment, storage, or disposal (TSD) facilities that could expose you to hazardous substances above permissible exposure levels (i.e., work in exclusion zones)? If yes, how many days per year? <input type="checkbox"/> 1-29 <input type="checkbox"/> 30+
Field and Lab	<input type="checkbox"/> Yes <input type="checkbox"/> No	Answer Yes if you do ANY of the following: a) Work at HAZWOPER sites 1 to 29 days per year b) Perform waste disposal activities c) Perform non-HAZWOPER environmental sampling d) Work in a chemistry laboratory 30 or more days per year e) Work on a pilot plant project 30 or more days per year f) Conduct bench-scale operations 30 or more days per year
Other	<input type="checkbox"/> Yes <input type="checkbox"/> No	Site- or project-specific biological monitoring or toxicological screening as specified by the project-specific health and safety plan.

Distribution:

- Supervisor
 HSE Representative

Employee Signature

Date

Supervisor Signature

Date



Health, Safety and Environment

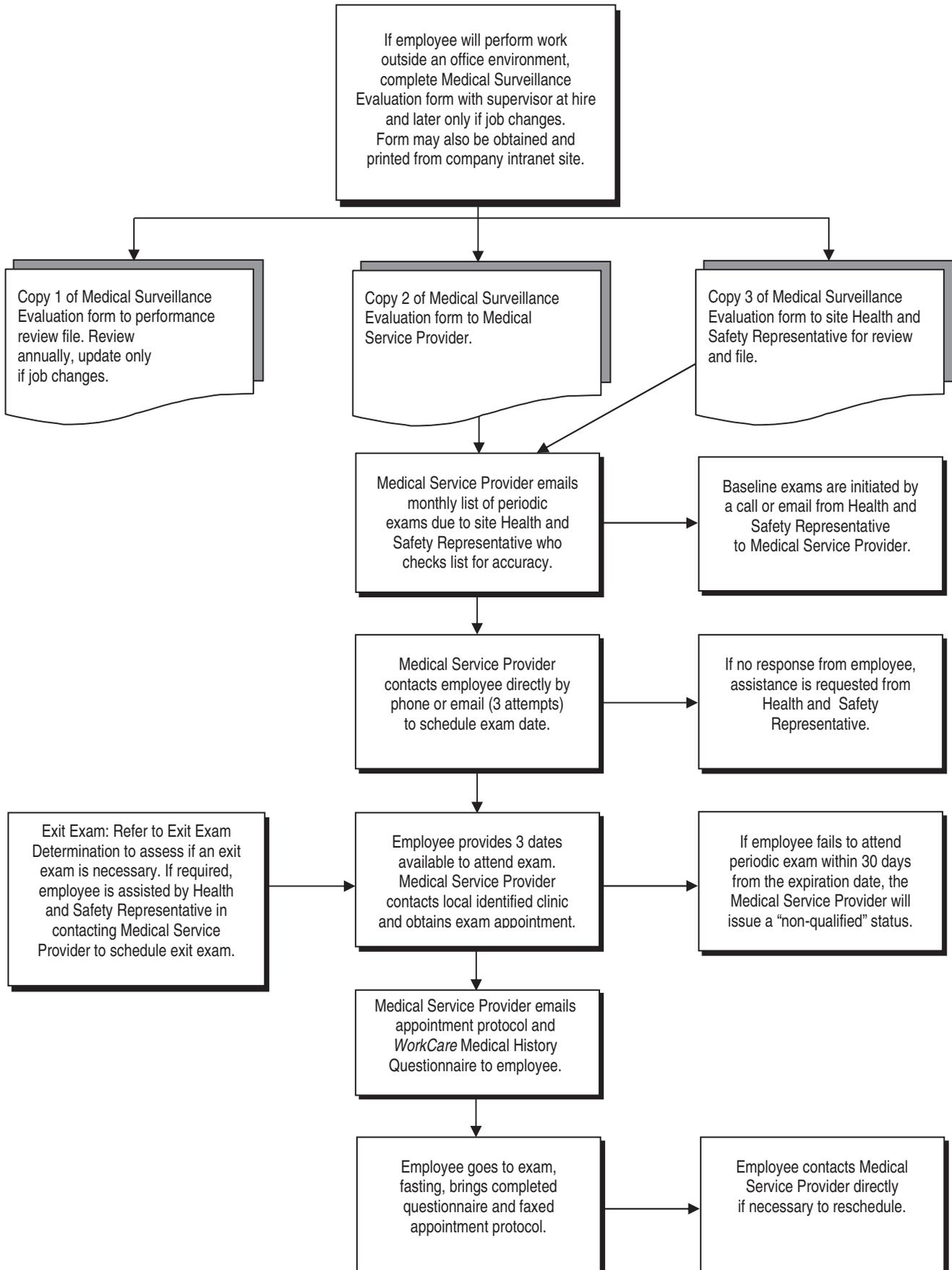
Attachment 024-3 NA

MEDICAL SCREENING and SURVEILLANCE EXAM PROTOCOL

Issue Date: February 2001
Revision 8: January 2011

PROTOCOL	HAZWOPER (Baseline or Preassignment Baseline)	HAZWOPER (Annual or Biennial)	HAZWOPER (Exit)	DIVING (Baseline and Biennial)	DOT Driver Certification (Baseline and Biennial)	ASBESTOS (Baseline, Annual, and Exit)	SILICA (Baseline and Biennial)	RESPIRATOR (Baseline and Annual)
Medical History & Respiratory Questionnaire	X	X	X	X	X	X	X	X
Medical Exam	X	X	X	X	X	X	X	If indicated by questionnaire
Physical Exam (height, weight, pulse, oral temperature, blood pressure)	X	X	X	X	X	X	X	
Vision	X	X	X	X	X	X	X	
Urinalysis	X	X	X	X	X	X	X	
Audiogram (hearing test)	X	X	X	X	X	If indicated by project noise levels	X	
Spirometry (pulmonary function test)	X	X	X	X	X	X	X	X
Electrocardiogram (EKG)								
Diver < Age 40		Every 2 years		Every 2 years				
Age < or = 50	X	Every 4 years		X			Every 4 years	
Age 50+	X	Every 2 years		X			Every 2 years	
Chest x-ray (one view)								
Age < or = 50	X	Every 4 years	If symptomatic or due on periodic	X		Baseline and every 5 years per 1910.1001	Baseline and Annual if 20+ years of silica exposure or Biennial if <20 years silica exposure	
Age 50+	X	Every 2 years	If symptomatic or due on periodic	X		Baseline and every 2-5 years per 1910.1001		
B-reader						X	X	
Complete Blood Count with White Cell Differential	X	X	X	X			X	
Blood Chemistry Panel	X	X	X	X			X	
Other				Sickle Cell (Baseline) Treadmill Stress Test (Baseline & Biennial after age 40)		OSHA Asbestos Questionnaire (Initial/Periodic)	OSHA Silica Questionnaire (Initial/Periodic)	TB Skin Test (MSHA regulated sites)

Note: Additional entry, periodic, and exit biological monitoring or toxicological screening may be indicated in the project-specific health and safety plan. Examples include blood lead/ZPP, serum/RBC cholinesterase, urine heavy metals (arsenic, cadmium, mercury, chromium, or beryllium), urine radiation (thorium, uranium), biological vaccinations (hepatitis A/B, tetanus), blood benzene, blood beryllium LPT, etc. Substance abuse testing is not included in the medical screening and surveillance program. Please consult the business-specific substance abuse testing program for more information.

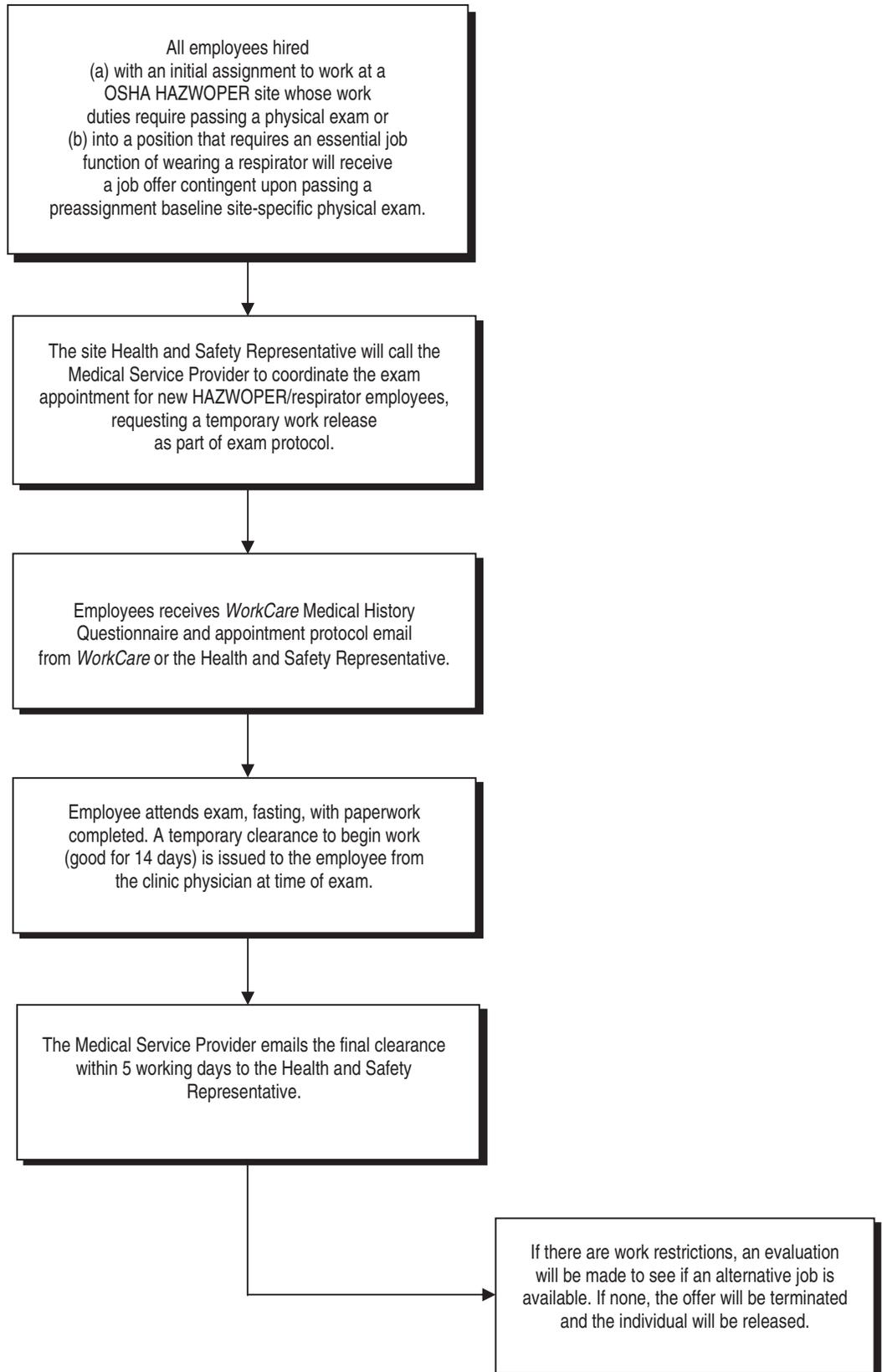


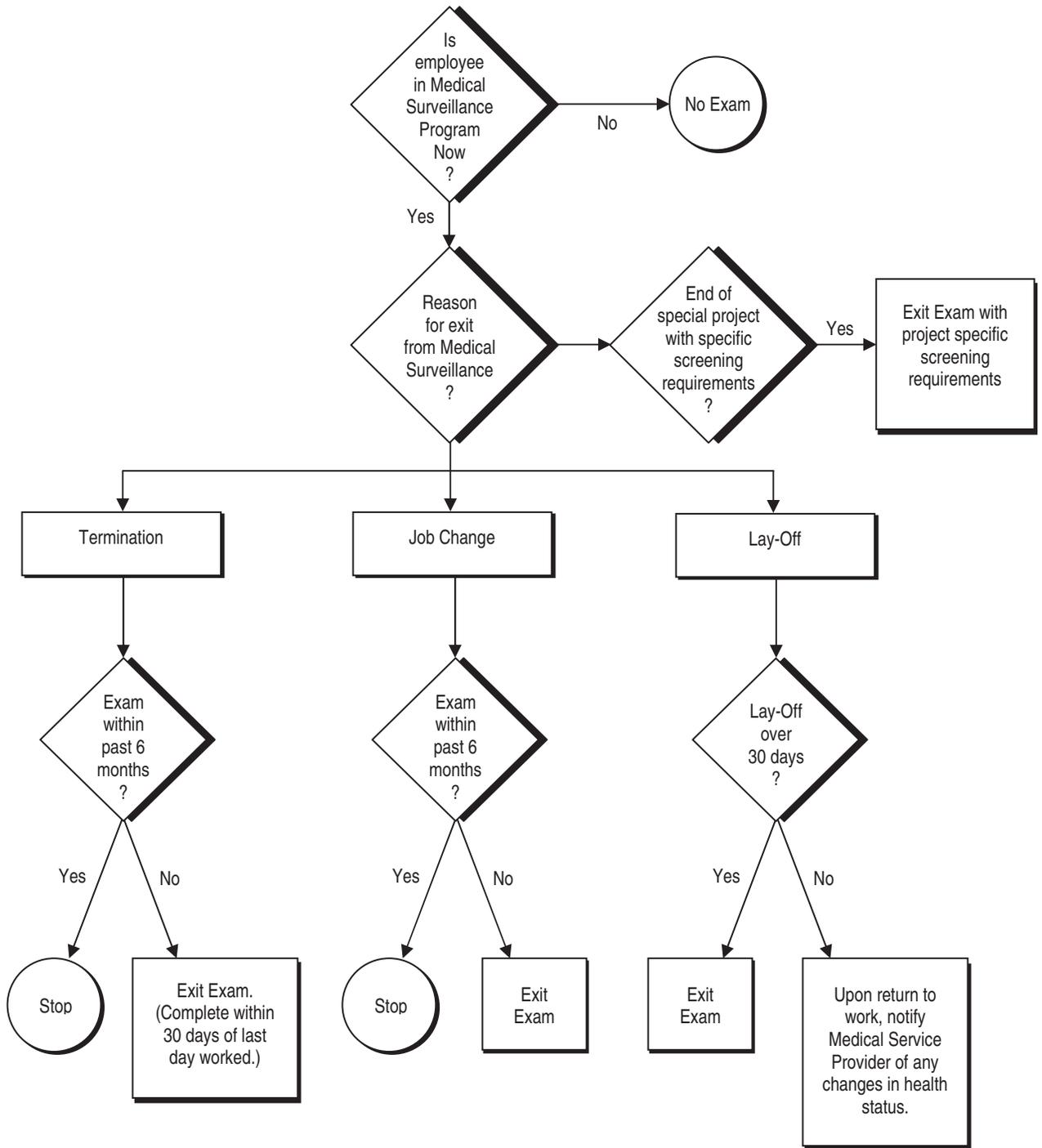


Health, Safety and Environment
**HAZWOPER AND RESPIRATOR
PRE-ASSIGNMENT BASELINE
EXAM PROTOCOL**

Attachment 024-5 NA

Issue Date: February 2001
Revision 8: January 2011





Note: Exit exams from Medical Service Provider or previous employer may be used for review as a URS Corporation baseline exam if completed within the past 3 months. A *WorkCare* Medical History Questionnaire is completed by the employee and submitted with a copy of the previous exam for physician review and approval.



Health, Safety and Environment
**WAIVER OF EXIT MEDICAL
SURVEILLANCE EXAM**

Attachment 024-7 NA

Issue Date: February 2001
Revision 8: January 2011

I have been a participant in URS' Medical Screening and Surveillance Program, which entitles me to an exit medical surveillance exam upon reassignment to a position that does not require medical clearance or termination of my employment. I understand that URS encourages employees to schedule and complete an exit medical exam; however, I voluntarily relinquish the opportunity to have an exit medical exam.

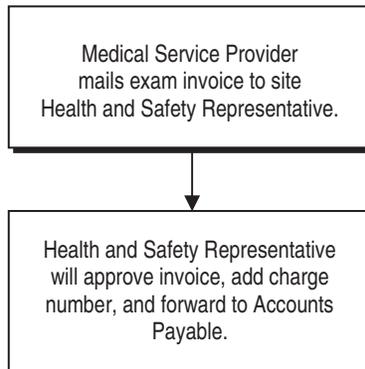
Name

Employee Number

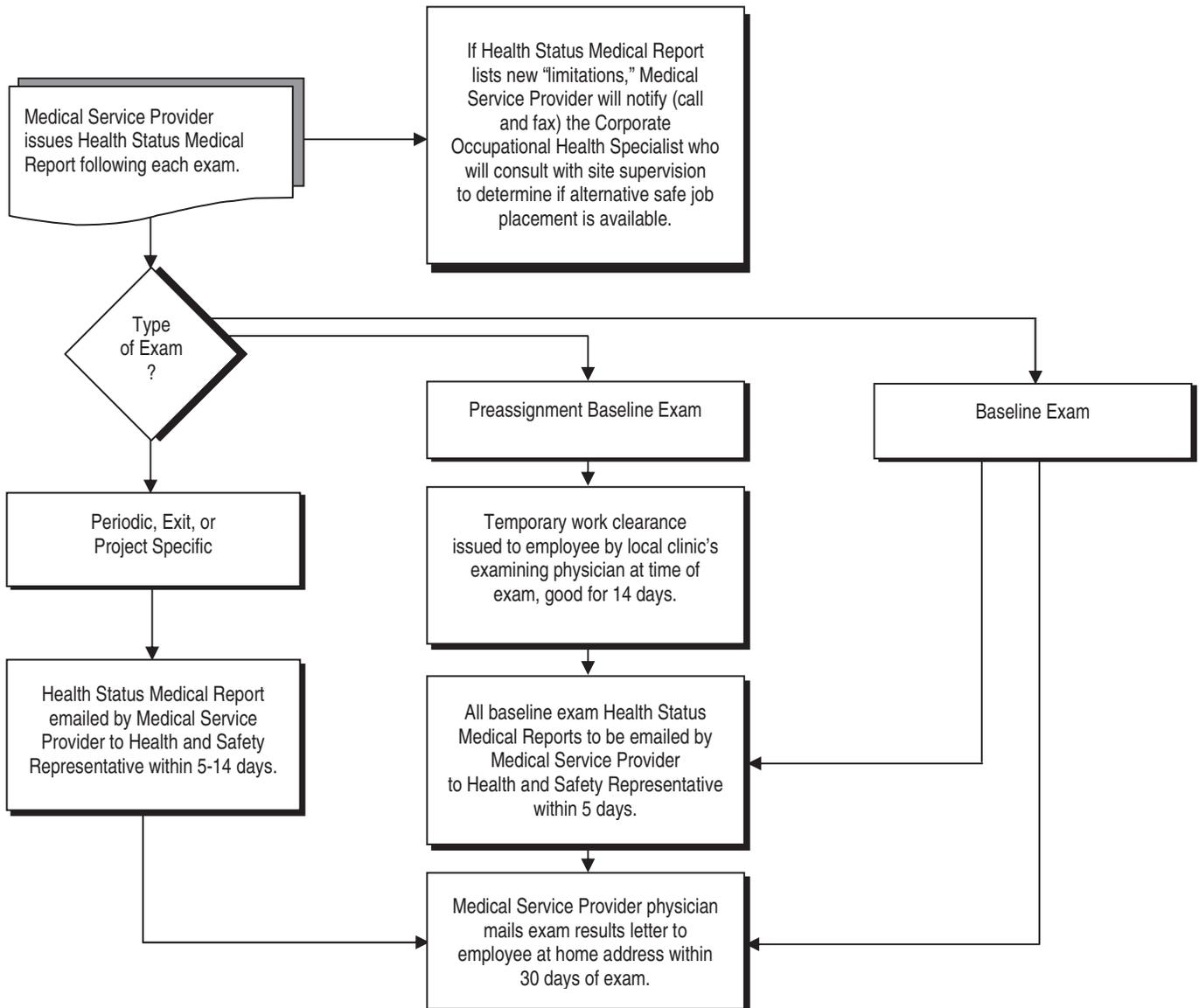
Date

Employee Signature

Billing



Medical Surveillance Exam Clearances



**FIRST AID KIT
SUPPLY LIST**

All first aid kits shall conform to the requirements of the ANSI Z308.1-2003, and shall contain the first aid items indicated below. The quantity, dimensions, or volume listed for each item is the **minimum** for compliance with this standard for Type I, II, or III kits. Type I kits are required to have a means for mounting in a fixed position and are generally not intended to be portable. Type II kits shall have a carrying handle. Type III kits shall have a carrying handle and shall provide a means to be mounted in a fixed position.

Required Contents:

- Absorbent Compress 32 sq in
- (16) Adhesive Bandages, 1X3 in
- Adhesive Tape - 3/8 in X 5 yd
- (10) Antiseptic 0.14 fl. oz. application
- (6) Burn Treatment, 1/32 oz. application
- Medical Exam Gloves
- Sterile pad - 3 X 3 in
- Triangular Bandage - 40 X 40 X 56 in

In addition to the required contents listed above, optional products and sizes may be included, depending on specific hazards, to augment a kit based upon the specific hazards existing in a particular work environment. Optional contents include:

- *Analgesic (Oral)* - Oral analgesics shall be packed in a single dose, tamper evident, package with full labeling as required by FDA regulations, and should contain no ingredients which are known to cause drowsiness.
- *Antibiotic Treatment* - Each antibiotic treatment shall be packaged in individual use applications containing at least 1/32 oz. of ointment. Each individual-use application shall not be reusable.
- *Bandage Compress* - Each compress shall consist of an absorbent, non-adherent pad substantially free from loose ends and raveling. The bandage shall be individually packaged, sealed and sterile.
- *Breathing Barrier* - The barrier shall be a single use disposable medical device for CPR use.
- *Burn Dressing* - Burn dressings shall be gel-soaked pad which is soluble in water and a single use.
- *Cold Pack* - Each cold pack shall be at least 4 X 5 in. and shall reach temperature within 10 seconds of activation. Cold packs shall activate under normal hand pressure and shall not leak under normal conditions of use.
- *Eye Covering* - Eye covering(s) shall have the ability to cover both eyes. Each eye covering shall be individually packaged, sealed, and sterile.
- *Eye Wash* - A minimum of 1 fl. oz. of a sterile isotonic buffered solution shall be contained in at least 0.5 fl. oz. individual use applications.
- *Roller Bandage* - Each bandage shall be at least 2 in. wide and at least 6 yd long. Each bandage shall be free from loose threads and raveling and individually packaged, and sealed

**URS SAFETY MANAGEMENT STANDARD 026
NOISE AND HEARING CONSERVATION**

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where personnel may encounter noise exposures that may exceed 85 decibels, measured using an A-weighted scale (dBA), as an 8-hour time-weighted average (TWA).

2. Purpose and Scope

The purpose of this procedure is to protect employees from hazardous noise exposures and to prevent hearing loss.

3. Implementation

Implementation of this procedure is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. General

1. The use of hearing protectors is required in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Whenever information indicates that any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, the project manager or location manager will be responsible for enforcing the proper use of hearing protectors.
2. Implement a hearing conservation program in accordance with 29 Code of Federal Regulations (CFR) 1910.95(c) when applicable. Work not applicable to 29 CFR 1910.95(c) will assess hazards of noise exposure on a task basis, and implement engineering or administrative controls to reduce employee noise exposure.
3. Hearing protectors will be used in the event that administrative or engineering controls are either not effective or not feasible, and the following criteria will be applicable to selection of hearing protection devices.
 - a. Require that at least two types of hearing protectors are available to employees free of charge, and that the type of hearing protector is suitable to the task.

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

- b. Require that hearing protectors are used in accordance with manufacturer's specifications to effectively protect hearing.
- c. Evaluate the effectiveness of the hearing protectors chosen. The manufacturer's assigned noise reduction rating (NRR) for hearing protection devices can seldom be achieved in workplace conditions; therefore this rating must be attenuated for real world conditions and use. To do so, subtract 7 from the NRR of the protector provided by the manufacturer. Divide this result by 2, and then subtract the remained from the observed "A" scale sound level measurement collected in the employee's work area (see Section 4.B). If this number is below 85, the hearing protectors are adequate for use in the work area.

B. Noise Surveys

1. Noise surveys must be conducted in a manner that reasonably reflects the exposure of the affected employees. Surveys must be conducted under the supervision of a URS Health, Safety, and Environment (HSE) Representative.
2. Sound-level meters and audio dosimeters used to determine employee exposure to noise sources must be Type II (accurate to within +/- 2 dBA), operated in "slow" response, on the "A" scale, and be calibrated to factory guidelines (including periodic factory recalibration).
3. Attachment 026-1NA (Sound Level Survey) and Attachment 026-2NA (Noise Dosimetry Field Sheet) may be used to record noise surveys.

C. Noise Controls

Eliminate noise sources to the extent possible. Examples of controls that must be considered include:

1. Adding or replacing mufflers on motorized equipment.
2. Adding mufflers to air exhausts on pneumatic equipment.
3. Following equipment maintenance procedures to lubricate dry bearings and replace worn or broken components.
4. Isolating loud equipment with barriers.
5. Replacing loud equipment with newer and quieter models.

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

6. Using caution signs and Hearing Protection Required signs to designate noisy work areas.
7. Installing HPD-dispensing devices at the entrance to noisy work areas.

D. Audiometric Exams

1. Tests

- a. Details on the medical surveillance program (including audiometric testing) are included in SMS 024 – Medical Screening and Surveillance.
- b. Audiometric tests will be performed by a person meeting the requirements described in 29 CFR 1910.95(g)(3). Within 6 months of an employee's first exposure at or above the action level, a valid baseline audiogram will be established, against which subsequent audiograms can be compared. Testing to establish a baseline audiogram will be preceded by 14 hours without exposure to noise. Hearing protectors may be used as a substitute for the requirement that a baseline audiogram will be preceded by 14 hours without exposure to workplace noise. The medical surveillance provider will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination. For multi-year projects, an annual audiogram will be obtained for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.
- c. Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid, and if there is a standard threshold shift (STS). A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 hertz (Hz) in either ear. If the annual audiogram shows that an employee has suffered an STS, the employer will obtain a retest within 30 days, and consider the results in assessing an STS as the annual audiogram. The audiologist, otolaryngologist, or physician will review problem audiograms, and will determine whether there is a need for further evaluation. If an STS has occurred, the medical surveillance provider will notify the employee within 21 days of the determination.

E. Standard Threshold Shifts

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

If an employee's test results show a confirmed STS, their hearing protection will be evaluated and refitted, and a medical evaluation may be required.

F. Training

Verify that each employee who must work in a noisy environment is current on required Hearing Conservation Training. At a minimum, training shall be conducted annually. Training must include the following topics:

1. The effects of noise on hearing.
2. The purpose of hearing protectors.
3. The advantages and disadvantages of various types of hearing protectors.
4. The attenuation of various types of hearing protection.
5. The selection, fitting, care, and use of hearing protectors.
6. The purpose of audiometric testing.
7. An explanation of the audiometric testing procedure.

5. Documentation Summary

The following documentation will be maintained:

- A. Noise surveys, when applicable.
- B. Training records.
- C. Audiometric tests (must be maintained by the Company's medical record retention vendor (e.g., WorkCare)).

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standard – [Occupational Noise Exposure – 29 CFR 1910.95](#)
- B. U.S. OSHA Construction Standard – [Occupational Noise Exposure – 29 CFR 1926.52 and 1926.101](#)

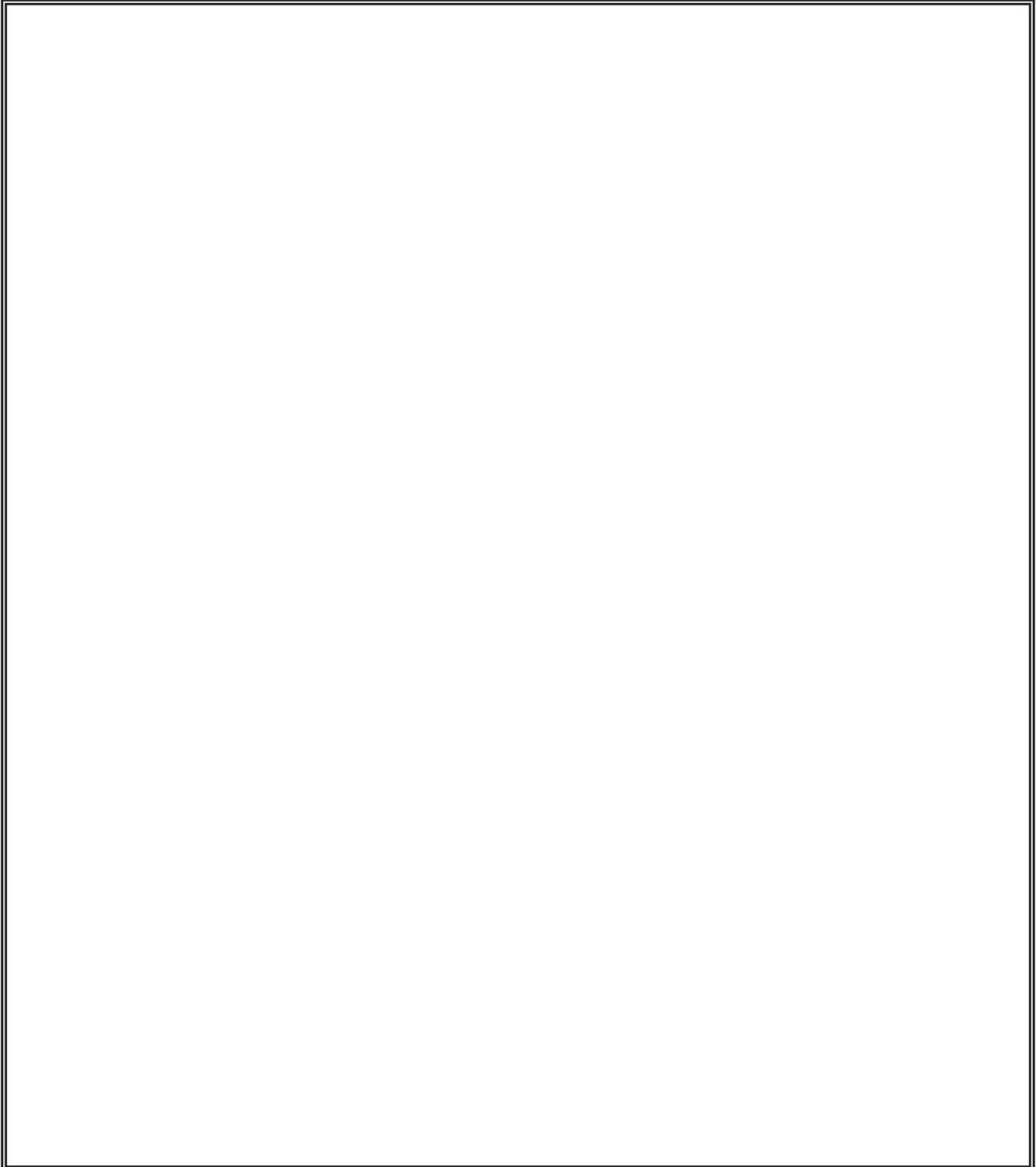
URS SAFETY MANAGEMENT STANDARD
Noise and Hearing Conservation

- C. U.S. MSHA – Occupational Noise Exposure [30 CFR 62](#)
- D. U.S. FRA – Occupational Noise Exposure [49 CFR 227](#)
- E. [U.S. OSHA Technical Links – Noise and Hearing Conservation](#)
- F. American Industrial Hygiene Association: [Protect Yourself from Noise-Induced Hearing Loss](#)
- G. [National Hearing Conservation Association web site](#)
- H. [SMS 024](#) – Medical Screening and Surveillance
- I. [Attachment 026-1NA](#) – Sound Level Survey
- J. [Attachment 026-2NA](#) – Noise Dosimetry Field Sheet



Drawing of Equipment or Work Layout

Reference Numbers refer to the Test Numbers on Page 1





**NOISE DOSIMETRY
FIELD SHEET**

Sample Identification

Sample #: _____ Date: _____
Employee Monitored: _____ Employee #: _____
Job: _____ Location: _____

Dosimeter Information

Model: _____ Serial # _____
Criterion Level (in dBA): _____ Threshold (in dBA): _____ Exchange Rate (in dBA): _____
Calibration (in dBA): Initial _____ Final _____
Weighting: Fast Slow

Calibrator Information

Model: _____ Serial #: _____ Class 1 2
Battery Check Completed: Date of Factory Calibration: _____

Sample Information

Time On: _____ Time Off: _____ Total Run Time (in min): _____
Time Weighted Average (in dBA): _____ %Dose: _____ Est. %Dose: _____
Average Sound Level (L_{avg}): _____ Peak Sound Level (L_{pk}): _____
Maximum Sound Level (L_{max}): _____ Minimum Sound Level (L_{min}): _____

Workplace Conditions

Scheduled Hours per Shift: _____ Operations: Normal? Abnormal?
Explain: _____

Hearing Protection: Type _____ % of Time Worn _____

Work Description/Comments

Sampled By: _____

**URS SAFETY MANAGEMENT STANDARD 029
PERSONAL PROTECTIVE EQUIPMENT**

URS Safety Management Standard

Personal Protective Equipment

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies where the use of personal protective equipment (PPE) is anticipated.

2. Purpose and Scope

The purpose of this standard is to provide information on recognizing those conditions that require PPE. PPE is designed to protect the employee from health and safety hazards that cannot be practically removed from the work environment.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

- A. Perform hazard assessments for those work activities that are likely to require the use of PPE.
 - 1. Use Attachment 029-1 NA to perform the assessment.
 - 2. Reevaluate completed hazard assessments when job conditions or duties change.
- B. Eliminate the hazards identified in Attachment 029-1 NA, if possible, through engineering or administrative controls.
- C. Select PPE that will protect employees if hazards cannot be controlled or eliminated.
 - 1. See Attachment 029-1 NA for recommended PPE.
 - 2. Review Material Safety Data Sheets for chemicals used for PPE recommendations.
 - 3. If needed, consult with the applicable safety representative for assistance in selecting PPE.
- D. Provide required PPE to employees free of charge (excluding, in some instances, components of standard work attire such as steel-toed boots and prescription safety glasses), assuring proper fit and providing a choice

URS Safety Management Standard **Personal Protective Equipment**

if more than one type of PPE is available. Where applicable, the local policy (office or project) regarding reimbursement for PPE will prevail.

- E. Provide the employees with the appropriate PPE whenever a hazard is recognized and PPE is required. However, when PPE is not required and the employee elects to wear his or her own PPE, the manager directing activities must ensure that the employee is properly trained in the fitting, donning, doffing, cleaning, and maintenance of his or her employee-owned equipment.
- F. Make employees aware that they are responsible for PPE maintenance, care, and proper use. Employees must inform their supervisors when a need arises to use PPE for which the employee has not received training, or when a condition exists where adequate PPE is not available.
- G. Conduct and document employee training.
 - 1. Train all employees who are required to wear PPE.
 - 2. Require that training includes:
 - a. When PPE is to be worn.
 - b. The type of PPE necessary for the task to be completed.
 - c. How to properly don, doff, adjust, and wear PPE.
 - d. Limitations of PPE.
 - e. Proper care, maintenance, useful life and disposal of PPE.
 - 3. Conduct training before PPE is assigned.
 - 4. Provide refresher training when:
 - a. The workplace changes, rendering previous PPE and training obsolete.
 - b. New types of PPE are assigned to the worker.
 - c. The worker cannot demonstrate competency in PPE use.
 - 5. Keep written records of the employees trained and type of training provided, including the date of training.

URS Safety Management Standard **Personal Protective Equipment**

H. PPE Specific Information

1. Head Protection

- a. Use hard hats in areas where there is the possible danger of head injury from the impact of falling or flying objects, striking against objects, electrical shock and/or burns, or any combination of these hazards. Hard hats will be worn when required by site safety procedures, client/site requirements, or when posted as an entry requirement.
- b. Adjust the hard hat suspension to fit the wearer and to keep the shell a minimum of 1.25 inches (3.2 cm) above the wearer's head. Do not store materials in the suspension. Cold weather liners and perspiration control bands may be utilized within the hard hat unless specifically excluded by the manufacturer.
- c. Wear hard hats in the forward position unless written verification and instructions from the hard hat manufacturer indicate your hard hat model has been tested and found to be compliant when worn backwards.
- d. Type 1 helmets are designed to protect the employee from impact and penetration caused by objects hitting the top of the head; Type II helmets extend this protection to the sides of the head as well.
- e. Class G (General) helmets provide protection against impact, penetration, and limited electrical hazards up to 2,200 volts. Class E (Electrical) helmets meet the same criteria, but electrical protection is increased to 20,000 volts. Class C (Conductive) helmets only provide impact and penetration protection.
- f. Do not use bump caps as protection against head injury, except when the only potential hazard is striking against objects and the use has been approved a Business, Country, Group, Regional Business Unit (RBU), or Strategic Business Unit (SBU) Health, Safety and Environment Manager.
- g. Do not alter hard hats in a way that will downgrade their efficiency. Typical prohibited alterations include painting,

URS Safety Management Standard **Personal Protective Equipment**

drilling holes in shell, application of metal jewelry, etc. Replace hats with these alterations or with excessive scratches.

- h. Wear integral chinstraps when working in high-wind conditions or near helicopters.
- i. Inspect hard hats before use and remove from service if any of the following are observed: cracking, tearing, fraying, chalking, and flaking.
- j. Remove hard hats and their components from service and replace as recommended by the manufacturer. Hard hats must be replaced after no more than 5 years.

2. Hearing Protection

- a. Provide hearing protection in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Each task in the work area will be evaluated for potential worker noise exposure as required.
- b. Review SMS 026 – Noise and Hearing Conservation – for additional information.

3. Eye and Face Protection

- a. Use eye and/or face protection when machines or operations create the risk of eye and/or face injuries due to physical, chemical, and/or radiation sources. Safety glasses will be worn when required by site safety procedures, client/site requirements, or when posted as an entry requirement.
- b. Provide safety glasses that can be worn over corrective spectacles for employees whose vision requires the use of corrective lenses. Employees will consult with the applicable safety representative or project managers for policies on reimbursement for prescription safety glasses.
- c. Do not use of sunglasses in place of required safety glasses. Heavily tinted safety glasses will only be used in outdoor areas with suitable lighting. Colored or lightly tinted or gradient lenses may be used indoors as appropriate to the work conditions.

URS Safety Management Standard
Personal Protective Equipment

- d. Tasks requiring grinding and cutting will require face shields over safety glasses. Tasks requiring power washing or handling corrosive chemicals will require a face shield over safety goggles. For welding tasks, refer to Supplemental Information B for lens selection criteria.
- e. Consult Supplemental Information A for additional information on types of eye and face protection and their various uses.

4. Hand Protection

- a. Wear gloves when the hands are exposed to hazards such as, but not limited to, chemical absorption, cuts or lacerations, abrasions, punctures, chemical burns, thermal burns, vibration, or temperature extremes.
- b. Gloves must always be provided to workers for tasks with potential hand hazards.
- c. Identify hand hazards during job or task hazard analysis. A supply of appropriate gloves in various sizes must be provided to workers assigned to work on that task.
- d. Inspect chemical gloves for degradation or tears prior to use. Do not remove chemical gloves from the work area if it is visibly contaminated. Chemical gloves may be decontaminated or disposed of according to specified procedures. In some cases, inner disposable chemical gloves (e.g., nitrile) will be required for protection of hands during removal of contaminated gloves.
- e. Select chemical-resistant gloves using manufacturer's hazard-based selection programs or other published guides that identify compatibility of glove material with chemical hazards. Selection must also consider physical requirements of the task with regard to puncture resistance and need for flexibility and dexterity in performing the task.
- f. Review SMS 064 – Hand Safety – for additional information.

5. Foot Protection

- a. Wear appropriate specialized protective footwear in the following environments:

URS Safety Management Standard
Personal Protective Equipment

- i. Using harmful corrosive substances or processes.
 - ii. Having a high probability of puncture or crushing injuries.
 - iii. Performing regular assembly or disassembly of heavy system components.
 - iv. Working in wet conditions.
 - v. Working in extreme cold.
 - vi. Working around exposed electrical wires or connections.
 - vii. When using hand-operated compactors, snow blowers, pressure washers, or steam cleaners.
 - viii. Other activities or areas as designated by supervisors or safety personnel.
- b. Employees assigned to field projects who are not required to wear specified protective footwear (e.g., steel-toed boots, metatarsal protection, rubber boots, insulated boots, etc.) will wear substantial leather, high-sided work boots. Shoes (leather, canvas, tennis, deck, or other types of material), sandals, high-heeled shoes, etc., are not allowed on field project sites.
- I. Maintain Protective Equipment
 - 1. Check PPE for damage, cracks, and wear prior to each use. Replace or repair equipment not found in good condition.
 - 2. Decontaminate non-disposable PPE with appropriate cleaner, as necessary, to prevent degradation of the equipment. Staff will remove any non-impermeable PPE/clothing that becomes contaminated with hazardous substances. These instructions are reiterated in the emergency decontamination procedures in the Health and Safety Plans.
- J. Periodically inspect worksites where employees are using PPE using Attachment 029-2 NA. Regularity of inspections should be determined by the project manager and/or site safety representative.

URS Safety Management Standard **Personal Protective Equipment**

5. Documentation Summary

The following information will be maintained in the project file:

- A. Completed Hazard Assessment Certification Forms (Attachment 029-1 NA).
- B. Completed Personal Protective Equipment Inspection Sheet (Attachment 029-2 NA).
- C. Documentation of employee training.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Standards – [Personal Protective Equipment – 29 Code of Federal Regulations \(CFR\)1910, Subpart I](#)
- B. U.S. OSHA Construction Standard - [Personal Protective Equipment – 29 CFR 1926 Subpart E](#)
- C. [U.S. OSHA Technical Links – Personal Protective Equipment](#)
- D. American National Standards Institute – [ANSI Z89.1-2003](#), Protective Headwear
- E. American National Standards Institute – ANSI Z87.1-2003 – Eye and Face Protection
- F. American National Standards Institute /International Safety Equipment Association, ANSI/ISEA 107 - 2004 – Standard for High-Visibility Safety Apparel
- G. American National Standards Institute – ANSI Z41-1991, Protective Footwear Requirements, American Society for Testing and Materials, ASTM F-2414-2005, Standard Test Methods for Foot Protection, ASTM F-2413-2005, Standard Specification for Performance Requirements for Protective Footwear
- H. American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) – 105-2011 – American National Standard for Hand Protection Selection Criteria"
- I. *Quick Selection Guide to Chemical Protective Clothing*, K Forsberg and S.Z. Mansdorf, Wiley Interscience, 2002

URS Safety Management Standard
Personal Protective Equipment

- J. Best Manufacturing Co. <http://www.bestglove.com/>. Information on chemical resistant gloves.
- K. [SMS 040](#) – Fall Protection
- L. [SMS 026](#) – Noise and Hearing Conservation
- M. [SMS 064](#) – Hand Safety
- N. [Attachment 029-1 NA](#) – Hazard Assessment Form
- O. [Attachment 029-2 NA](#) – Personal Protective Equipment Inspection Form

7. Supplemental Information

- A. [Eye and Face Protector Selection Guide](#)
- B. [Welding Lens Selector](#)
- C. [Traffic Control Class Guidelines and Scenarios](#)



Health, Safety and Environment
**HAZARD ASSESSMENT
CERTIFICATION FORM**

Attachment 029-1 NA

Issue Date: July 2000
Revision 8: September 2011

Location: _____ Job No.: _____

Date: _____ Assessment conducted by: _____

Specific tasks performed at this location: _____

If any of the indicated hazards are present, eliminate the hazard or use the indicated PPE.

Overhead Hazards

- | | | |
|---|--|---|
| 1. Suspended/elevated loads, beams, or objects that could fall or strike head | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hard hat, ANSI Z89, Class G, E or C |
| 2. Flying objects that could strike head | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hard hat, ANSI Z89, Class G, E or C |
| 3. Energized wires or equipment that could strike head | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hard hat, ANZI Z89, Class G or E (dependent on potential voltage) |
| 4. Sharp objects or corners at head level | <input type="checkbox"/> Yes <input type="checkbox"/> No | Hard hat, ANSI Z89, Class G, E or C |

Eye Hazards

- | | | |
|--|--|---|
| 5. Chemical splashes or irritating mists | <input type="checkbox"/> Yes <input type="checkbox"/> No | See Supplemental Information A for additional information |
| 6. Excessive dust | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety glasses or goggles |
| 7. Smoke and/or fumes | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety goggles |
| 8. Welding operations | <input type="checkbox"/> Yes <input type="checkbox"/> No | Welding goggles; See Supplemental Information A and B for additional information |
| 9. Lasers/optical radiation | <input type="checkbox"/> Yes <input type="checkbox"/> No | Have URS HSE Representative assist you in proper selection |
| 10. Projectiles | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety glasses or goggles plus face shield |
| 11. Sawing, cutting, chipping, and/or grinding | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety glasses or goggles plus face shield; See Supplemental Information A for additional information |

Face Hazards

- | | | |
|---|--|---|
| 12. Chemical splashes or irritating mists | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety goggles; See Supplemental Information A for more information; add face shield if irritating or corrosive |
| 13. Welding operations | <input type="checkbox"/> Yes <input type="checkbox"/> No | Welding goggles or welding helmet; see Supplemental Information A and B for additional information |
| 14. Projectiles | <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety glasses or goggles plus face shield |

Hand Hazards

- | | | |
|----------------------------------|--|--|
| 15. Chemical exposure | <input type="checkbox"/> Yes <input type="checkbox"/> No | Use chemical-resistant gloves specific to hazard; consult MSDS, chemical hazard guide, or HSE Representative |
| 16. Sharp edges, splinters, etc. | <input type="checkbox"/> Yes <input type="checkbox"/> No | Leather or Kevlar gloves |
| 17. Temperature extremes – heat | <input type="checkbox"/> Yes <input type="checkbox"/> No | Leather gloves, welder's gloves, hot mill gloves |



Health, Safety and Environment
**HAZARD ASSESSMENT
CERTIFICATION FORM**

Attachment 029-1 NA

Issue Date: July 2000
Revision 8: September 2011

If any of the indicated hazards are present, eliminate the hazard or use the indicated PPE.

- | | | | |
|--|------------------------------|-----------------------------|---|
| 18. Temperature extremes – cold | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Insulated gloves |
| 19. Blood, fungus, biological agents | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Nitrile gloves |
| 20. Exposure to live electrical currents | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Electrical gloves; consult HSE representative |
| 21. Sharp tools, machine parts, etc. | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Leather or Kevlar gloves |
| 22. Material handling | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Leather gloves |

Foot Hazards

- | | | | |
|---|------------------------------|-----------------------------|--|
| 23. Heavy materials (greater than 50 pounds) handled by employees | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Safety shoes or boots |
| 24. Potential to crush whole foot | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Safety shoes or boots with metatarsal guard |
| 25. Sharp edges or points (puncture risk) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Safety shoes or boots |
| 26. Exposure to electrical hazards | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Safety shoes or boots with:

Conductive - Protects the wearer in an environment where the accumulation of static electricity on the body is a hazard.

Static dissipative - Reduces the accumulation of excess static electricity by conducting body charge to ground while maintaining a sufficiently high level of resistance.

Electrical hazard - Provides a secondary source of protection against accidental contact with live electrical circuits, electrically energized conductors, parts or apparatus, and is manufactured with non-conductive electrical shock resistant soles and heels. |
| 27. Slippery conditions | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Rubber-soled boots or grips |
| 28. Chemical contamination | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Rubber, PVC, or polyurethane boots or boot covers with puncture and protective toe if task required |
| 29. Wet conditions | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Rubber boots or boot covers |
| 30. Construction/demolition | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Safety boots with metatarsal guard if foot-crushing hazard exists |

Fall Hazards

- | | | | |
|---|------------------------------|-----------------------------|---------------------------------------|
| 31. Elevations above 4 feet (general industry) or 6 feet (construction) without guardrails | <input type="checkbox"/> Yes | <input type="checkbox"/> No | ANSI A-10.14 Type 1 full-body harness |
| 32. Suspended scaffolds, boatswain's chairs, float scaffolds, or suspended staging | <input type="checkbox"/> Yes | <input type="checkbox"/> No | ANSI A-10.14 Type 1 full-body harness |
| 33. Working in trees | <input type="checkbox"/> Yes | <input type="checkbox"/> No | ANSI A-10.14 Type 1 full-body harness |
| 34. Working in vehicle-mounted elevating work platforms (e.g., bucket trucks, aerial lifts) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | ANSI A-10.14 Type 1 full-body harness |



**Health, Safety and Environment
HAZARD ASSESSMENT
CERTIFICATION FORM**

Attachment 029-1 NA

Issue Date: July 2000
Revision 8: September 2011

Water Hazards

35. Working on or above water where a risk of drowning exist Yes No U.S. Coast Guard approved personal floatation device; Type I, II, or III

Excessive Heat or Flame

36. Full body chemical protective clothing in temperatures greater than 80 °F Yes No Cooling vest
37. Work around molten metal or flame Yes No Nomex or heat reflective clothing
38. Welding activities Yes No Welding leathers for those areas that are exposed to flame, spark, or molten metal

Respiratory Hazards

39. Airborne particulates, gases, vapors, or mists in excess of established exposure limits Yes No Refer to SMS 042 or URS HSE Representative for respirator selection guidance

Excessive Noise

40. Exposure to noise Yes No Ear plugs, muffs or both

Body and Leg Protection

41. Chemical exposure Yes No Contact URS HSE Representative for assistance in proper selection
42. Using chainsaw, cutting brush Yes No Chainsaw chaps
43. Exposure to snakes Yes No Snake chaps
44. Exposure to vehicle traffic or heavy equipment Yes No See SMS 032 and SMS 029 NA – Supplemental Information C for additional guidance

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on: _____

Name _____ Signature _____



**Health, Safety and Environment
PERSONAL PROTECTIVE EQUIPMENT
INSPECTION SHEET**

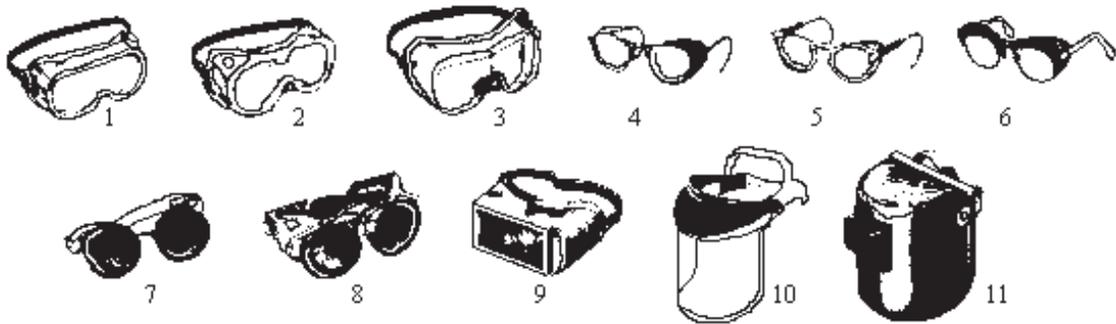
Attachment 029-2 NA

Issue Date: July 2000
Revision 8: September 2011

Name of Inspector _____ Date Inspected _____

Hard Hats	
1. The brim or shell does not show signs of exposure and excessive wear, loss of surface gloss, chalking, or flaking.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Suspension system in hard hat does not show signs of deterioration, including cracking, tearing, or fraying.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. The brim or shell is not cracked, perforated, or deformed.	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Employees use hard hats in marked areas.	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Areas requiring hard hat usage are marked.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shoes	
6. Safety shoes used by employees do not show signs of excessive wear.	<input type="checkbox"/> Yes <input type="checkbox"/> No
7. Areas requiring safety shoes are marked.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Work Gloves	
8. Gloves are available and worn when needed.	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Gloves are appropriate for the task.	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Gloves do not show signs of excessive wear such as cracks, scrapes, or lacerations, thinning or discoloration, or break-through to the skin.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Protective Clothing	
11. Protective clothing (including traffic control apparel) is worn by employees when required.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Hearing Protection	
12. Noise hazard areas are posted.	<input type="checkbox"/> Yes <input type="checkbox"/> No
13. Employees are using earplugs or muffs when using noise producing equipment or working in posted noise hazard areas.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	
14. Eye hazard areas are marked or posted.	<input type="checkbox"/> Yes <input type="checkbox"/> No
15. Employees use safety glasses when working in eye hazard areas or working with equipment that produces an eye hazard.	<input type="checkbox"/> Yes <input type="checkbox"/> No
16. Face shields are used when required and worn over safety glasses.	<input type="checkbox"/> Yes <input type="checkbox"/> No

REMARKS (All "No" answers indicate a hazard which needs to be fixed.)



- | | |
|--|---|
| <ul style="list-style-type: none"> 1. GOGGLES, Flexible Fitting, Regular Ventilation 2. GOGGLES, Flexible Fitting, Hooded Ventilation 3. GOGGLES, Cushioned Fitting, Rigid Body 4. SPECTACLES, Metal Frame, with Sideshields 5. SPECTACLES, Plastic Frame, with Sideshields 6. SPECTACLES, Metal-Plastic Frame, with Sideshields | <ul style="list-style-type: none"> 7. GOGGLES, Eyecup Type (Tinted Lenses – Welding; Clear Lenses – Chipping) 8. GOGGLES, Coverspec Type (Tinted Lenses – Welding; Clear Lenses – Chipping) 9. WELDING GOGGLES, Coverspec Type, Tinted Plate Lens 10. FACE SHIELD (Plastic or Mesh Window) 11. WELDING HELMETS |
|--|---|

APPLICATIONS		
OPERATION	HAZARDS	RECOMMENDED PROTECTORS Bold Type Numbers = Slightly Preferred Protection
ACETYLENE – BURNING ACETYLENE – CUTTING ACETYLENE – WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	7,8,9
CHEMICAL HANDLING	SPLASH, ACID BRUNS, FUMES	2,10 (For severe exposure, add 10 over 2)
CHIPPING	FLYING PARTICLES	1,2,4,5,6,7,8
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	9,11 (11 in combination with 4,5,6 in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	7,8,9 (For severe exposure, add 10)
GRINDING – LIGHT	FLYING PARTICLES	1,3,4,5,6,10
GRINDING – HEAVY	FLYING PARTICLES	1,3,7,8 (For severe exposure, add 10)
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	2 (10 when in combination with 4,5,6)
MACHINING	FLYING PARTICLES	1,3,4,5,6,10
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	7,8 (10 in combination with 4,5,6 in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	1,3,4,5,6,10

Non-side shield spectacles available for limited hazard use requiring only frontal protection.



Health, Safety and Environment
WELDING LENS SELECTION

SMS 029 NA
Supplemental Information B
Issue Date: February 2009
Revision 1: December 2009

Operations	Electrode Size (1/32")	Arc Current	Minimum Protective Shade
Shielded metal arc welding (SMAW)	Less than 3	Less than 60	7
SMAW	3 – 5	60 – 160	8
SMAW	5 – 8	160 – 250	10
SMAW	More than 8	250 – 550	11
Gas metal arc welding and flux cored arc welding		Less than 60	7
Gas metal arc welding and flux cored arc welding		60 - 160	10
Gas metal arc welding and flux cored arc welding		160 – 250	10
Gas metal arc welding and flux cored arc welding		250 - 500	10
Gas tungsten arc welding		Less than 50	8
Gas tungsten arc welding		50 – 150	8
Gas tungsten arc welding		150 - 500	10
Air carbon arc cutting	(light)	Less than 500	10
Air carbon arc cutting	(heavy)	500 – 1000	11
Gas tungsten arc welding		Less than 20	8
Gas tungsten arc welding		20 – 100	8
Gas tungsten arc welding		100 – 400	10
Gas tungsten arc welding		400 – 800	11
Plasma arc cutting	(light)	Less than 300	8
Plasma arc cutting	(medium)	300 – 400	9
Plasma arc cutting	(heavy)	400 -800	10
Torch blazing			3
Torch soldering			2
Carbon arc welding			14
Gas welding			5 – 6
Oxygen cutting			3 - 5

A. Class 1 Safety Apparel

1. Class 1 safety apparel provides the minimum amount of required material to differentiate the wearer from the work environment.
2. At a minimum, this shall include 217 square inches (in²), or 0.14 square meters (m²), of fluorescent yellow-green, orange-red, or red background materials combined with 155 in² (0.10 m²) retro-reflective material. As an alternative, the apparel can have 310 in² (0.20 m²) of combined-performance material (i.e., materials that are both retro-reflective and fluorescent).
3. Class 1 safety apparel typically consists of a sleeveless traffic vest with retro-reflective bands no less than 0.98 inches (25 mm) in width.
4. Those occupational activities under which Class 1 safety apparel is typically used:
 - a. Permit full and undivided attention to approaching traffic;
 - b. Provide ample separation of the pedestrian worker from conflicting vehicle traffic; and
 - c. Permit optimum conspicuity in backgrounds that are not complex with vehicle and moving equipment speeds not exceeding 25 miles per hour (mph), or 40 kilometers per hour (kph).
5. Examples of pedestrian workers who could work in these situations may include:
 - a. Workers directing vehicle operators to parking/service locations;
 - b. Workers exposed to the hazards of warehouse equipment traffic;
 - c. Roadside "right-of-way" or sidewalk maintenance workers; and
 - d. Delivery vehicle drivers.

B. Class 2 Safety Apparel

1. Class 2 safety apparel provides superior visibility for the wearers by the additional coverage of the torso and is more conspicuous than Class 1.
2. At a minimum, this shall include 775 in² (0.50 m²) of fluorescent yellow-green, orange-red, or red background materials combined with 201 in² (0.13 m²) retro-reflective material. Combined-performance materials may not be used without background materials in Class 2.
3. Class 2 safety apparel typically consists of a full-torso sleeveless traffic vest with retro-reflective bands no less than 1.38 inches (35 mm) in width.
4. Those occupational activities under which Class 2 safety apparel is typically used:
 - a. Greater visibility is desired during inclement weather conditions;
 - b. Complex backgrounds are present;
 - c. Employees are performing tasks which divert attention from approaching vehicle traffic;

- d. Work activities take place in close proximity to vehicle traffic; and
 - e. Vehicle and moving equipment speeds exceed 25 mph (40 kph).
5. Examples of pedestrian workers who could work in these situations may include:
- a. Roadway construction workers;
 - b. Utility workers;
 - c. Survey crews;
 - d. Railway workers;
 - e. Forestry workers;
 - f. Parking and/or toll gate personnel;
 - g. Airport baggage handlers/ground crew;
 - h. Emergency response personnel;
 - i. Law enforcement personnel; and
 - j. Accident site investigators.

C. Class 3 Safety Apparel

1. Class 3 safety apparel offers greater visibility to the wearer in both complex backgrounds and through a full range of body movements. Visibility is enhanced beyond Class 2 by the enhancement of background and reflective materials to the arms and/or legs.
2. At a minimum, this shall include 1240 in² (0.80 m²) of fluorescent yellow-green, orange-red, or red background materials combined with 310 in² (0.20 m²) retro-reflective material. Combined-performance materials may not be used without background materials in Class 3.
3. Class 3 safety apparel typically consists of a coveralls, jumpsuits, long or short-sleeved jackets, or long-sleeved shirts with retro-reflective bands no less than 1.97 inches (50 mm) in width. A sleeveless garment or vest alone shall not be considered Class 3 apparel.
4. Those occupational activities under which Class 3 safety apparel is typically used:
 - a. Workers are exposed to significantly high vehicle speeds and/or reduced sight distances (note that several sources have interpreted the vehicle speed requirements as 50 mph (80 kph) or more);
 - b. The worker and vehicle operator have high task loads, clearly placing the worker in danger; or
 - c. The wearer must be conspicuous through a full range of body motions at a minimum of 1280 feet (390 m) and must be identifiable as a person.
5. Examples of pedestrian workers who could work in these situations may include:
 - a. Roadway construction personnel;
 - b. Utility workers;

- c. Survey crews;
- d. Emergency response personnel; and
- e. Flagging crews.

D. Class E Safety Apparel

1. Class E apparel includes trousers or shorts which are part of a Class 3 apparel ensemble. Frequently a Class 2 vest is paired with Class E trousers, creating an overall ensemble which meets Class 3 apparel requirements. Class E garments are not intended to be worn without Class 2 or 3 garments.
2. At a minimum, Class E trousers shall have 465 in² (0.30 m²) of fluorescent yellow-green, orange-red, or red background materials combined with 108 in² (0.07 m²) retro-reflective material. Retro-reflective material shall encircle each leg (360° of visibility) and be placed not less than 1.97 inches (50 mm) above the bottom leg of the trouser.
3. At a minimum, Class E shorts shall have 465 in² (0.30 m²) of fluorescent yellow-green, orange-red, or red background materials combined with 108 in² (0.07 m²) retro-reflective material. Retro-reflective material shall encircle each leg.

E. Headwear

1. Headwear is considered an important accessory and compliments the overall visibility of the wearer. High-visibility headwear enhances visibility to the head of a moving worker in daylight and helps define the shape of the human form during nighttime exposures.
2. At a minimum, high-visibility headwear shall have 78 in² (0.05 m²) of fluorescent yellow-green, orange-red, or red background materials combined with 10 in² (0.0065 m²) retro-reflective material. As an alternative, the headwear can have 78 in² (0.05 m²) of combined-performance material.

URS SAFETY MANAGEMENT STANDARD 030
SANITATION

URS SAFETY MANAGEMENT STANDARD

Sanitation

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide employees with appropriate personal hygiene facilities, including toilets, wash rooms, and eating facilities, to protect employees from unsanitary conditions.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility or site.

4. Requirements

A. Prior to the start of site activities, ensure the availability of adequate toilet and wash facilities. Note: Mobile crews having transportation readily available (within 5 minute travel time) to nearby toilet facilities need not be provided with facilities.

1. Flush toilets will be used where available.
2. For job sites without flush toilets readily available, one of the following must be provided:
 - a. Chemical toilets.
 - b. Combustion toilets.
 - c. Recirculation toilets.
3. Other than construction sites, toilets will be provided for employees of each sex at sites according to the following ratio:

Number of Employees	Minimum # of toilets ⁽¹⁾
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	⁽²⁾

Notes:

(1) Where toilet facilities will not be used by women, urinals may be provided instead of the minimum specified.

(2) One (1) additional fixture for each additional 40 employees.

URS SAFETY MANAGEMENT STANDARD
Sanitation

- B. A means for washing hands must be provided next to or near toilet areas.
- C. For facilities under URS control:
 - 1. Maintain toilets and toilet area in good repair and in a clean and sanitary condition. Refer to SMS 021 – Housekeeping.
 - 2. Provide paper towels and soap or other suitable sanitizing material for washing hands.
 - 3. Construct toilets so that the interior is lighted, by artificial or natural light, adequate ventilation is provided, and all windows and vents are screened.
- D. Maintain availability and cleanliness of drinking (potable) water.
 - 1. Use backflow prevention devices, testing, and administrative controls for all potable water supply branches. Maintain backflow prevention devices in a sanitary condition.
 - 2. Keep water coolers and water dispensers in a sanitary condition and filled only with potable water. Clearly mark potable drinking water containers as “Drinking Water.”
 - 3. Clean and sanitize water containers daily. Tightly close, seal, date, and mark containers as to the contents. Provide containers with a tap, and refill daily.
 - 4. Provide fountain-type dispensers or one-use cups at each water dispenser. Provide a waste receptacle where disposable cups are used.
 - 5. Do not use common drinking cups.
 - 6. Conspicuously post outlets for non-potable water such as water for industrial or firefighting purposes (e.g., Danger – Water Unfit for Drinking, Washing, or Cooking).
 - 7. Laboratory-test drinking water obtained from streams, wells, or other temporary sources in accordance with federal, state, or local regulations, or often enough to ensure it is suitable for consumption. Maintain records of testing reports and results.

URS SAFETY MANAGEMENT STANDARD
Sanitation

E. Eating Facilities

1. Operate and maintain food dispensing facilities established by URS in compliance with applicable health and sanitation regulations.
2. Ensure that buildings housing these facilities are floored completely, painted, well lighted, heated, ventilated, fly proof, and sanitary. Equip doors and windows with screens.
3. Use microwave ovens for food only.
4. Use refrigerators designated for food storage for food only (i.e., no chemical or samples storage).
5. Prohibit workers from eating and drinking or storing foods and drinks in areas where there is a potential for contamination.
6. Take positive control measures for protection against vermin, insects, and rodents.
7. Provide an ample supply of hot and cold water at all times in mess halls.
8. Clean break rooms /lunchrooms periodically. Refer to SMS 021 – Housekeeping.

F. Washing Facilities

1. Maintained each washing facility in a sanitary condition, and provide adequate water, soap, individual towels of cloth or paper, and covered receptacles for disposal of waste.
2. Provide emergency showers and eyewash facilities as required. Refer to SMS 065 – Injury Management.
3. Provide at least one shower for each 30 employees in construction camps. The use of a common towel is prohibited.

G. Waste Management:

1. Release sanitary sewage into sanitary sewer lines or to other proper disposal channels.
2. Do not dispose of garbage, refuse, or sewage in lakes, reservoirs, rivers, streams, or ditches.

URS SAFETY MANAGEMENT STANDARD

Sanitation

3. Do not discharge hazardous waste into the sanitary sewer or storm sewer system.
4. Collect garbage and trash daily.
 - a. Provide lids for garbage containers located outside buildings, and keep them closed. Transport garbage offsite at least weekly.
 - b. Remove garbage from the site daily at remote field sites where wild animals are a hazard. Do not let garbage remain on site overnight.

H. Change Rooms

Provide heated and ventilated change rooms for changing, hanging, and/or drying clothing for operations subjecting workers to prolonged wetting or contact with hazardous materials.

I. Sleeping Facilities

1. Keep temporary sleeping quarters heated, ventilated, lighted, and clean. Screen all doors and windows.
2. Keep clean and sanitary, and periodically disinfect bunkhouses, bedding, and furniture.

J. Notify property manager of sanitation issues for sites not under URS control.

K. Personal Hygiene

Wash hands and face before eating, drinking, smoking, and using facilities.

L. Inspect work sites periodically in accordance with Attachment 030-1 NA.

5. Documentation Summary

The following information will be maintained in the project file:

- A. Completed inspection sheets.

URS SAFETY MANAGEMENT STANDARD
Sanitation

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Construction Standard – [Sanitation – 29 Code of Federal Regulations \(CFR\) 1926.51](#)
- B. U.S. OSHA General Industry Standard – [Sanitation – 29 CFR 1910.141](#)
- C. [SMS 021](#) - Housekeeping
- D. [SMS 065](#) – Injury Management
- E. [Attachment 030-1 NA](#) - Sanitation Inspection Sheet



Health, Safety and Environment
SANITATION INSPECTION SHEET

Attachment 030-1 NA
Issue Date: June 1999
Revision 4: September 2011

Location: _____ Job No: _____

Date Inspected: _____ Name of Inspector: _____

Toilets

1. Are there an adequate number of toilets on site? Yes No NA
1 to 15 employees = 1 toilet
16 to 35 employees = 2 toilets
36 to 55 employees = 3 toilets
56 to 80 employees = 4 toilets
81 to 110 employees = 5 toilets
2. Toilets are in clean condition. Yes No NA
3. Toilet paper is provided. Yes No NA
4. Toilet areas are clean and sanitary. Yes No NA

Hand Washing Facilities

5. Hand washing facilities are provided near toilets. Yes No NA
6. Paper towels and soap are provided. Yes No NA

Drinking Water

7. Drinking water is provided on site. Yes No NA
8. Disposable cups are provided or fountain-type dispenser is provided. Yes No NA
9. Drinking water containers are kept clean and tightly closed or covered. Yes No NA

Break Rooms

10. Break rooms or eating areas are kept clean. Yes No NA
11. Microwaves are used for food only. Yes No NA
12. Microwave ovens are kept clean. Yes No NA
13. Refrigerators are kept clean. Yes No NA
14. Refrigerators are used to store food only. Yes No NA

Vermin

15. Rats, mice, and other vermin are not living within buildings. Yes No NA
16. Cockroaches and fleas are not thriving within buildings. Yes No NA

Employee Compliance

17. Employees only eat/drink in areas free from contamination. Yes No NA
18. Employees wash hands/face prior to eating, drinking, smoking. Yes No NA

REMARKS:

**URS SAFETY MANAGEMENT STANDARD 032
WORK ZONE TRAFFIC CONTROL**

URS SAFETY MANAGEMENT STANDARD

Work Zone Traffic Control

1. Applicability

This standard applies to those activities of URS Corporation and its subsidiary companies involving work performed on roads, highways, and similar areas where motor vehicles may be a hazard, and where URS is responsible for traffic control.

2. Purpose and Scope

This standard is intended to protect personnel from the hazards associated with work performed on or next to highways and roads.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

- A. Review the project in the planning phase to determine if any work will be performed on or adjacent to any road that will disrupt normal traffic flow.
- B. Where project operations will be performed on or adjacent to roadways, plan work to interfere as little as possible with traffic, and to provide and maintain ingress and egress for all residences and places of business that may be impacted.
- C. When required by local regulations or when there is a potential to disrupt traffic, a traffic control plan, in detail appropriate to the complexity of the project, must be prepared by a competent person and understood by all responsible parties before activities begin. Any changes in the traffic control plan should be approved by an official trained in safe traffic control practices.
 1. Competent persons are those who are knowledgeable about the fundamental principles of temporary traffic control and the work activities to be performed, and who have the authority to propose and implement corrective measures to eliminate hazardous situations associated with temporary traffic control.
 2. Design traffic control plans to meet requirements set forth in Part 6 of the *Manual on Uniform Traffic Control Devices* (MUTCD), as well as those rules set by state, county, and cities in which work is

URS SAFETY MANAGEMENT STANDARD
Work Zone Traffic Control

performed. At a minimum, the plan will include information on the following, as needed:

- a. Pedestrian and worker safety;
 - b. Temporary traffic control elements, including (but not limited to) temporary traffic control zones, advance warning zones, transition areas, activity areas, termination areas, tapers, buffers, detours, etc.;
 - c. Flagger controls, including high-visibility safety apparel, hand-signaling devices, and flagger procedures;
 - d. Temporary traffic control zone devices, including (but not limited to) signs, illuminated/flashing panels, warning devices, channelizing devices, drums, barricades, pavement markings; and
 - e. Temporary traffic control zone activities, including scope of work, duration, location, and portions of the roadway/shoulder affected.
- D. Submit the traffic control plan to the applicable road authority for approval.
- E. A Worksite Traffic Control Supervisor, certified by the American Traffic Safety Services Association (ATSSA) or an equivalent organization will be responsible for initiating, installing, and maintaining all traffic control devices. The Worksite Traffic Control Supervisor will also directly supervise all project flaggers.
1. Certified flaggers must attend an 8-hour work-zone traffic control course as taught by an ATSSA certified instructor (or equivalent).
- F. Execute the traffic control plan developed for the job site.
- G. Require all personnel exposed to the risks of moving roadway traffic or construction equipment to wear hardhats, safety glasses, sleeved shirts, long pants, work boots, and the appropriate class of high-visibility safety apparel. Safety apparel background material must be either fluorescent orange-red or fluorescent yellow-green, with accompanying reflective material of orange, yellow, white, silver, or yellow-green, or fluorescent versions of these colors.

URS SAFETY MANAGEMENT STANDARD
Work Zone Traffic Control

H. Wear high-visibility clothing as follows:

1. Class 1 safety apparel (as defined by American National Standards Institute/International Safety Equipment Association [ANSI/ISEA]) for activities that permit the worker:
 - a. Full and undivided attention to approaching traffic;
 - b. Ample separation between the worker and vehicle traffic;
and
 - c. Optimum visibility in uncomplicated backgrounds where vehicle and equipment speeds do not exceed 25 miles per hour (mph) (40 kilometers per hours [kph]).
2. Wear Class 2 safety apparel for activities where:
 - a. Greater visibility is required due to bad weather;
 - b. There are complicated backgrounds;
 - c. Employees are performing tasks that draw their attention away from approaching traffic;
 - d. Vehicle speeds exceed 25 mph (40 kph); and
 - e. Work activities take place closer to the vehicle traffic.
3. Wear class 3 safety apparel for activities where:
 - a. Workers are exposed to higher vehicle speeds (generally 50 mph [80 kph] or more) or reduced sight distances;
 - b. The worker and vehicle operators have a high task load; and
 - c. The worker must be visible through the full range of body motions as a person at a minimum of 1,280 feet (390 meters).
4. Refer to SMS 029 – Personal Protective Equipment, for additional information on high-visibility clothing requirements, including suggested apparel for each class.

- F. Perform inspection and maintenance of the Traffic Control devices using Attachment 032-1 NA daily, or at the beginning of each shift.

URS SAFETY MANAGEMENT STANDARD

Work Zone Traffic Control

5. Documentation Summary

The following information will be maintained in the project file:

- A. Copies of traffic control plans used on site.
- B. Training certificates for Traffic Control Supervisors and flaggers.
- C. Inspection records (Attachment 032-1 NA).

6. Resources

- A. Part VI of the [Manual on Uniform Traffic Control Devices](#) (MUTCD) – 2009 Edition
- B. [American Traffic Safety Services Association](#)
- C. [ATTSA Flagger Train-the-Trainer Program](#)
- D. [ANSI/ISEA 107-2004](#) – Standard for High-Visibility Safety Apparel
- E. [SMS 029](#) – Personal Protective Equipment
- I. [Attachment 032-1](#) – Traffic Control Device Inspection Checklist



Health, Safety, and Environment
**TRAFFIC CONTROL DEVICE
INSPECTION CHECKLIST**

Attachment 032-1 NA

Issue Date: June 1999
Revision 3: December 2009

Project Name: _____

Project Number: _____

Location Inspected: _____

1. **Are any devices missing?** Yes No

Do any devices need repair? Yes No

Were all replaced or repaired? Yes No

Notes:

2. **Are any lights (flashers, etc.) not functioning?** Yes No

Were they all replaced or repaired? Yes No

Notes:

3. **Are any devices improperly placed?** Yes No

Were all positions corrected? Yes No

Notes:

4. **Do any devices need cleaning?** Yes No

Were all devices cleaned? Yes No

Notes:

5. **Are flaggers certified and flagging appropriately?** Yes No

Notes:

Additional Comments:

The above check was completed by: _____

Date: _____ Time: _____

**URS SAFETY MANAGEMENT STANDARD 034
UTILITY CLEARANCES AND ISOLATION**

URS SAFETY MANAGEMENT STANDARD

Utility Clearances and Isolation

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where personnel may encounter subsurface or overhead utilities.

2. Purpose and Scope

Many field activities are conducted near aboveground and underground utilities. The primary purpose of this standard is to establish operating requirements that will permit employees to work safely in the vicinity of electrical, natural gas, fuel, water, and other utility systems and installations. The secondary purpose is to prevent economic damage to utility systems from operations associated with project-related activities.

The term *utility clearance* includes the following:

- A. The positive locating of utility systems in or near the work area.
- B. A signed statement by an appropriate representative attesting to the location of underground utilities and/or the positive de-energizing (including lockout) and testing of electrical utilities.

In some cases, utility representatives may deem it appropriate or necessary to use insulating blankets to isolate a power line. This is an acceptable alternative to positive de-energizing; however, only utility representatives can make the determination.

"Contact" with overhead power lines is considered to occur when equipment is closer to power lines than permitted by the criteria in the table in Section 4.C.2.b. (See note for operations in the United Kingdom).

On-site utilities, including emergency shut-off locations, shall be depicted on a utility drawing or plot plan. Emergency shut-off locations shall be verified before work activities commence.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

- A. Time for Completion

Complete utility clearances prior to the start of any work in the area of the utility that could feasibly result in contact with or damage to that utility.

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Utility Clearances and Isolation

B. Local Regulations

Research local and state codes and regulations regarding utility locating and isolation requirements. Utility companies and locating services are among the appropriate resources.

C. Overhead Power Lines

1. Proximity to Power Lines

No work is to be conducted within 50 feet (15 meters) of overhead power lines without first contacting the utility company to determine the voltage of the system and the height (at the lowest point) of the line has been measured. No aspect of any piece of equipment is to be operated within 50 feet (15 meters) of overhead power lines without first making this determination.

An exclusion zone shall be created at ground level beneath and 50 feet (15 meters) perpendicular to the overhead power lines on each side. This exclusion zone shall be demarcated with visual indicators (e.g., signage, flagging, paint, cones). No equipment shall enter the exclusion zone without approval from URS site management.

2. Operations adjacent to overhead power lines are prohibited unless one of the following conditions is satisfied:

- a. Power has been shut off, positive means (such as lockout) have been taken to prevent the lines from being energized, lines have been tested to confirm the outage, and the utility company has provided a signed certification of the outage.
- b. The minimum clearance from energized overhead lines is presented in the following table, or the equipment will be repositioned and blocked so that no part, including cables, can come within the minimum clearances listed in the table.

Minimum Distances from Power Lines	
Nominal System (kilovolt, kV)	Minimum Required Distance
0–50	10 feet (3 meters)
51–100	12 feet (3.6 meters)
101–200	15 feet (4.6 meters)
201–300	20 feet (6.1 meters)
301–500	25 feet (7.6 meters)
501–750	35 feet (10.7 meters)
751–1000	45 feet (13.7 meters)

URS SAFETY MANAGEMENT STANDARD

Utility Clearances and Isolation

Note: For operations in the United Kingdom, the specific safe distance is determined by the utility company.

- c. The power line(s) has been isolated through the use of insulating blankets, which have been properly placed by the utility. If insulating blankets are used, the utility will determine the minimum safe operating distance; get this determination in writing with the utility representative's signature.
3. All inquiries regarding electric utilities must be made in writing and a written confirmation of the outage/isolation must be received by the appropriate URS representative prior to the start of the task that may impact the utility.

D. Underground Utilities

1. Do not begin subsurface work (e.g., trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted. The use of as-built drawings must be confirmed with additional geophysical or other surveys. Attachment 034-1 NA may be used to verify all utilities have been located prior to performing subsurface work.
2. Contact utility companies or the state/regional utility protection service at least two (2) working days prior to excavation activities to advise them of the proposed work and to ask them to establish the location of the underground utility installations prior to the start of actual excavation. One Call utility location service is available throughout the United States by calling 811. Where these services are unavailable (e.g., private properties), contract with an independent utility locating service to perform an evaluation of subsurface utilities.
3. Obtain utility clearances for subsurface work on both public and private property. Clearances are to be in writing and signed by the party conducting the clearance.
4. Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, the URS representative must notify the utility company, utility protection service, or the utility locating service to inform them that the markings have been destroyed.

URS SAFETY MANAGEMENT STANDARD

Utility Clearances and Isolation

5. Do not conduct mechanical-assisted subsurface work (e.g., work using a powered drill rig, mechanical excavator, etc.) within five (5) feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure. Confirm minimum distances for mechanical-assisted subsurface work with the utility owner, as distances beyond this five-foot minimum may be required.
6. Nondestructive clearance techniques (e.g., vacuum extraction or other hand clearing means) are required prior to drilling/excavating in higher risk locations, including chemical plants, retail service stations, or other locations with complex underground utility systems.
7. Subsurface work within five feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure must be done by nondestructive clearing techniques to the point where the obstruction is visually located and exposed. Once the obstruction location is confirmed in this manner, mechanical-assisted work may begin.
8. Reference SMS 013 – Excavation Safety for additional information regarding subsurface operations.

E. Utility Strikes

1. Utility strikes (unplanned contact with utilities resulting in damage to the utility or its protective coating) shall be reported in accordance with SMS 049 – Injury/Illness/Incident Reporting & Notifications.
2. All damaged utilities shall be repaired by a qualified and/or licensed professional.

F. Training

Conduct a briefing for site employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Documents requesting utility clearance.
- B. Documents confirming utility clearance.

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Utility Clearances and Isolation

C. Training/briefing documentation of each isolation.

6. Resources

- A. Utility Locating Services (typically under "Utility" in the Yellow Pages)
- B. National Institute for Occupational Safety and Health (NIOSH) Alert – [Preventing Electrocutions from Contact Between Cranes and Power Lines](#)
- C. [One Call Utility Locating List](#)
- D. [National Utility Locating Contractor's Association](#)
- E. [Attachment 034-1](#) – Utility Clearance Checklist
- F. [SMS 013](#) – Excavation Safety
- G. [SMS 049](#) – Injury/Illness/Incident Reporting



Health, Safety and Environment
UTILITY CLEARANCE CHECKLIST

Attachment 034-1 NA

Issue Date: June 1999
Revision 6: September 2011

Project Name:	Project Number:
Project Location:	Client Name:
URS Project Manager Name:	Date Completed:

For any item answered 'No', Project Manager approval required before work can proceed.	
Within the last 10 days, and not less than 72 hours from the initiation of the task, contacts were notified that the public utility locate service (One Call) was made.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Available records have been referenced and a plot plan indicating the location of all underground utilities have been provided and are available for reference at the work site.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

Completed Site Walk Over With Site Personnel (site manager, property owner or tenant representative)			
Site Personnel Name:	Site Personnel Signature:		
Does Site Personnel have any additional information regarding site utilities?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Comment:	
Building Utility Service Line Connections Identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Cleared:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

Field Observations – Any ** responses must be explained in box below.	
Field walk completed and utilities identified on page 2 of this form are cleared?	<input type="checkbox"/> Yes <input type="checkbox"/> No**
Apparent saw cuts or patches in concrete/pavement?	<input type="checkbox"/> Yes** <input type="checkbox"/> No
Piping along building exterior? Identify purposed and layout.	<input type="checkbox"/> Yes** <input type="checkbox"/> No <input type="checkbox"/> N/A
Manholes, vault covers, drains, pipes present?	<input type="checkbox"/> Yes** <input type="checkbox"/> No
Piping inside of manholes correlate to utility markings?	<input type="checkbox"/> Yes <input type="checkbox"/> No** <input type="checkbox"/> N/A
Clear line-of-sight (equipment/vehicles/snow not blocking view or potential utilities)?	<input type="checkbox"/> Yes <input type="checkbox"/> No**
Work between potential utilities or manholes?	<input type="checkbox"/> Yes** <input type="checkbox"/> No
Work areas clear of overhead utilities?	<input type="checkbox"/> Yes <input type="checkbox"/> No**
All known utilities located on plot/site map for personnel to review?	<input type="checkbox"/> Yes <input type="checkbox"/> No**
Explanations:	

Public Utility Locate (OneCall)			
Date Called:		Called By:	
Ticket Number:		Valid Until:	
Area Requested To Be Cleared:			

Private Utility Locate		
Company Performing Locate:		Date Completed:
Area(s) Requested To Be Cleared (including distance around marked locations):		
Method(s) Used (e.g., GPR, EM):		
Confirm Area(s) Cleared:		



UTILITY CLEARANCE CHECKLIST

OneCall Utilities			Field Observation
Utility	Notified by	Comments	Marked (mains and services)
Electric (Red)	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Gas/Petroleum Pipeline (Yellow)	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No
Sewer/Drainage (Green)	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No
Water (Blue)	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No
Communications (Orange)	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Other	<input type="checkbox"/> OneCall <input type="checkbox"/> Other		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above

Utilities Not Identified By OneCall (Includes both Public and Private along with Regional and Site Utilities)			Field Observation
Utility (Colors may vary)	Owner / Contact / Phone #	Notified	Marked
Communications: (Orange) TV, computer, phone, cell towers, site communication, cameras, security, etc.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Electricity: (Red) Mains / Supplies / Interior / Exterior (signs, fuel pumps, low voltage security perimeters, gates, property light posts, equipment, substations, etc.)		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Gas: (Yellow) Mains / Supplies / Equipment / Pipelines (Natural, Process, Oil, Crude, Refined (Gas, Diesel, Jet), etc.)		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Steam (Yellow)		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Structures: Possible horizontally installed facilities, vaults, basements, tunnels, sub-grade structures, foundations, overhead obstructions, etc.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
UST Systems (Tanks / piping / electric)		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sewer: (Green) Sanitary, storm, combined, septic, drainage (parking, buildings, fields), irrigation		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Water: (Blue) Process, Plant, potable, well, cooling, return/makeup, fire, sprinkler, landscape irrigation, reclaim (Purple) other		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above
Other: Abandoned Lines, invisible dog fences, shopping cart perimeter monitoring, traffic lights		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Above

If subsurface work is within five feet (1.5 meters) of a confirmed or suspected utility or other subsurface structure, nondestructive clearing techniques (e.g., air knife, vacuum excavation, hand auger) must be completed to visually locate and expose the utility.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Precautions have been taken to prevent contact with overhead or underground utilities.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

Printed Name of Person Completing Checklist:	Signature:
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**URS SAFETY MANAGEMENT STANDARD 042
RESPIRATORY PROTECTION**

URS SAFETY MANAGEMENT STANDARD

Respiratory Protection

1. Applicability

This standard applies to URS Corporation and its subsidiary companies that may require the use of respiratory protection, including Immediately Dangerous to Life and Health (IDLH) and emergency conditions. This program also addresses the voluntary use of respirators.

2. Purpose and Scope

The purpose of this standard is to protect those employees performing operations for which exposures cannot be controlled by use of conventional engineering or administrative controls, and prior to establishing a negative air exposure assessment, and to require that respiratory protective equipment is selected, used, maintained, and stored in accordance with acceptable practices. This procedure establishes the minimum standard for respirator training, selection, and use during the performance of all work requiring such protection.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

- A. Before assigning hazardous jobs to employees, determine if respirators are required.
 - 1. Assign a project-specific Respiratory Protection Program administrator. This position shall be manned by a competent industrial hygienist or other technically qualified person who knowledgeable of the requirements of the URS and project-specific programs, have appropriate training in the principles and application of respiratory protection, and have the authority to conduct program evaluations.
 - 2. If the potential for respiratory hazards exists for any portion of a job, complete Attachment 042-1 NA – Identifying When A Respirator Is Needed.
 - 3. Contact a local Health, Safety, and Environment (HSE) Manager, Regional or Strategic Business Unit (RBU/SBU) HSE Manager, or URS Certified Industrial Hygienist (CIH) for assistance, as needed, if any of the questions in Attachment 042-1 are checked "yes."

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4. Follow instructions in Attachment 042-2 NA – Voluntary Use or Respirators – for employees who wish to wear respirators on a voluntary basis when not required to by URS or a regulatory agency.
 5. Follow all the requirements of this standard for employees who wish to voluntarily use tight-fitting (e.g., air purifying) respirators.
 6. Required respirators will be paid for by URS and will be provided without cost to the employee.
 7. Control worker's exposure to air contaminants, where practicable, by engineering or administrative controls, or by substitution of process materials with less-toxic substances. Use respirators only when engineering or administrative controls are not feasible or completely effective.
- B. Select the proper respirator for the job.
1. Contact the appropriate HSE Manager or CIH for assistance in respirator selection for those jobs identified in Attachment 042-1 NA.
 2. Contact the appropriate HSE Manager for follow up if there are any problems implementing the recommendations made.
- C. Require employees who will use respirators to be medically qualified by a project medical consultant (PMC) before fit-testing and assigning them a respirator. The PMC should preferably be an occupational physician; however, the Occupational Safety and Health Administration (OSHA) allows any physician or licensed health care professional (PLHCP) to conduct evaluations of respiratory protection medical forms. The PMC, where required, will determine the physiological and psychological status that is relevant to wearing different types of respirators. The PMC will review all questionnaires and test results and verify in writing that workers are physically and psychologically able to perform work while using respiratory protective devices. These determinations will be made using guidelines established by the PMC.
1. For program details, refer to SMS 024 – Medical Screening and Surveillance.
 2. Require that employees have a current and accurate Medical Surveillance form (Attachment 024-2).
 3. Obtain a copy of the employee's Health Status Medical Report from the Office Health and Safety Representative. The consulting occupational

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Respiratory Protection

physician of the medical service provider following each work-related examination issues the Health Status Medical Report. Employees cannot be assigned respirators unless they are medically cleared for respirator use.

- D. Require respirator users to receive appropriate training.
 - 1. All respirator users must be trained:
 - a. Before they are assigned a respirator.
 - b. Annually thereafter.
 - c. Whenever a new hazard or job is introduced.
 - d. Whenever employees fail to demonstrate proper use or knowledge.
 - 2. Document training in accordance with the requirements of SMS 055 – Training.
 - 3. Training must address, at a minimum, the following:
 - a. Why the respirator is necessary, and what conditions can make the respirator ineffective.
 - b. What the limitations and capabilities of the respirators are.
 - c. How to inspect, put on and remove, and check the seals of the respirator.
 - d. What the respirator maintenance and storage procedures are.
 - e. How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.
 - f. The engineering and administrative controls being used and the need for respirators.
 - g. The hazards and consequences of improper respirator use.
 - h. How to recognize and handle emergency situations.
- E. Require respirator users to be fit tested.

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Respiratory Protection

1. Any employee who has been assigned a reusable respirator must be fit tested on an annual basis (no more than 1 year may elapse between fit tests), or when the employee is assigned a respirator of a different make, type, or size from that previously tested.
2. Qualitative or quantitative fit testing can be performed by contract or in-house personnel.
3. Obtain a signed, written copy of the fit-test results. The fit-test results should include:
 - a. Employee's name and employee identification number.
 - b. Respirator brand, model, and size fitted for.
 - c. Date fit tested.
 - d. Method of fit testing used.
 - e. Name and signature of fit tester.
 - f. Manufacturer and serial number of fit-testing apparatus (if used).

A fit test results form is available as Attachment 042-3 NA.

- F. The project-specific Respiratory Protection Program administrator will issue respirators to persons who must wear respirators for protection against harmful atmospheres should be given adequate training to ensure that the correct respirator is issued for each application. This training should include, but not necessarily be limited to, the following:
 1. Establishment of a working knowledge of the specific types of respirators to be issued, their limitations, and the importance of issuing only the respirators for which each user is specifically approved.
 2. Familiarization with the respirator maintenance and repair program in order to be able to identify any respirator that is improperly cleaned or needs repair.
 3. Familiarization with the procedures for respirator issue. Only persons trained to ensure that proper respirators are issued will be permitted to issue respirators to persons needing them.
- G. Where required by Section 2.C of SMS 043 – Personal Monitoring, conduct initial exposure assessments for contaminants of concern. Record collected air-monitoring data. Respiratory protection must be worn until such

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assessments have been conducted, and it is determined that respiratory protection is not warranted.

- H. Provide qualified employees with respirator(s) and adequate amounts of parts and cartridges.
 - 1. Assign employees whose duties require respirators their own respirator for which they have been fit tested.
 - 2. Provide special eyeglass inserts designed for the respirator if an employee must wear eyeglasses with a full-facepiece respirator. Contact lenses may be worn when wearing a full-facepiece respirator.
 - 3. Respirators and cartridges must be approved by the National Institute for Occupational Safety and Health (NIOSH). Military-issue respirators are approved under Military Standard AR 11-34.
- I. Require respirators to be used properly.
 - 1. Prohibit facial hair where the respirator-sealing surface meets the wearer's face.
 - 2. Require employees to perform a positive and negative fit check every time the respirator is put on.
 - 3. Employees will leave the area where respirators are being used:
 - a. Before removing the facepiece for any reason.
 - b. To correct any respirator malfunction.
 - c. To change the respirator and/or respirator cartridges.
 - d. The employee becomes ill (dizziness, nausea, etc.).
 - e. If any of the following is detected:
 - 1. Vapor or gas breakthrough
 - 2. Leakage around the facepiece
 - 3. Increased breathing resistance.
 - 4. Use cartridges with End-of-Service-Life indicators, or determine the respirator cartridge change-out schedule. See Supplemental Information A for guidance.

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Respiratory Protection

- J. Require respirators to be cleaned and stored properly.
 - 1. Clean and disinfect respirators after each use.
 - 2. Store respirators in a plastic bag or case and in a clean location.
 - 3. Inspect respirators before use and after each cleaning.

- K. Address issues associated with special-use respirators (self-contained breathing apparatus; air-supply respirators; emergency escape respirators).
 - 1. Self-Contained Breathing Apparatus

Inspect self-contained breathing apparatus monthly and after each use in accordance with manufacturer's instructions.

 - 2. Air-Supplied Respirators
 - a. Air used for atmosphere-supplying respirators must meet or exceed the requirements for Type 1 – Grade D breathing air. Never use oxygen.
 - 1. A certificate of analysis must accompany bottled air.
 - 2. Compressors used to supply breathing air must:
 - i. Prevent entry of contaminated air into the air supply.
 - ii. Minimize moisture content.
 - iii. Have suitable in-line sorbent beds and filter to provide appropriate air quality.
 - iv. Have a high-carbon-monoxide alarm that sounds at 10 part per million (ppm).

 - b. Couplings on air-hose lines must be incompatible with other gas system.

 - 3. Emergency Escape Respirators
 - a. Emergency escape respirators intended to be used only for emergency exit. This may include situations where IDLH atmospheres and oxygen-deficient conditions exist. These respirators may be used as stand-alone protection or in conjunction with air-supplied respirators.

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Respiratory Protection

- L. Require follow-up training and medical surveillance to be provided as directed.
 - 1. Provide follow-up physical examinations as directed by the SMS 024-3 NA – Medical Screening and Surveillance Exam Protocol table.
 - 2. Provide follow-up physicals as directed by the Occupational Health Manager.
 - 3. Provide annual refresher training.
 - 4. Provide annual fit testing.
 - 5. Conduct regular evaluations to determine the effectiveness of the program's implementation. This should include interviews with employees regarding such topics as respirator selection, fit, and maintenance.

- M. Where required, implement procedures for dealing with entry into areas with IDLH conditions.
 - 1. Ensure at least one employee or attendant is located outside the area with the IDLH atmosphere. This person must be equipped with:
 - a. Pressure demand or other positive pressure self-contained breathing apparatus (SCBA), or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
 - b. Appropriate retrieval equipment to removing the employee within the IDLH atmosphere, or
 - c. Equivalent means of rescue.
 - 2. Maintain communication between the employee(s) in the area with the IDLH environment and the employee(s) or attendant(s) outside the area. Communication may include visual, voice, or signal lines.
 - 3. In an emergency situation, the manager overseeing operations must be notified before employee(s) outside the area with the IDLH atmosphere enter the space.

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Respiratory Protection

5. Documentation Summary

All Respiratory Protection Program documentation must be protected by the Privacy Act of 1974 (PL-93-579), and confidential medical information not required by OSHA may be protected under the Health Insurance Portability Accountability Act of 2003 (HIPAA).

The following information will be maintained in the office/project file by the Project Manager:

1. Identifying When A Respirator Is Needed – Attachment 042-1 NA.
2. Voluntary Use of Respirators – Attachment 042-2 NA.
3. Fit Test Record – Attachment 042-3 NA.
4. Employee Health Status Medical Report, including clearance for respirator use.
5. Employee Respirator Training Records.

6. Resources

- A. U.S. OSHA Standard - [Respiratory Protection](#) – 29 Code of Federal Regulations (CFR) 1910.134
- B. U.S OSHA Technical Links – [Respiratory Protection](#)
- C. [ANSI Z88.6-2006](#) – Respirator Use – Physical Qualifications for Personnel
- D. [AIHA](#), The Occupational Environment – Its Evaluation and Control
- E. [NIOSH Respirator Decision Logic](#)
- F. [NIOSH Guide to Industrial Respiratory Protection](#)
- G. [SMS 024](#) – Medical Screening and Surveillance Program
- H. [SMS 055](#) – Health and Safety Training
- I. [Attachment 042-1 NA](#) – Identifying When a Respirator is Needed
- J. [Attachment 042-2 NA](#) – Voluntary Use of Respirators
- K. [Attachment 042-3 NA](#) – Fit Test Record

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- L. [Attachment 042-4 NA](#) – Respirator Standard Operating Procedure

7. Supplemental Information

- A. [Respirator Cartridge Change Schedule](#)
- B. [Hazard Analysis for Respirator Use](#)
- C. [Fit Testing Guidance](#)
- D. [Respirator Selection Guidance](#)
- E. [Inspection, Cleaning, and Storage Guidance](#)



Health, Safety and Environment
**IDENTIFYING WHEN A RESPIRATOR
IS NEEDED**

Attachment 042-1 NA

Issue Date: July 2000
Revision 5: August 2010

Site Location: _____ Date: _____

Name of Person Performing Evaluation: _____

Project: _____

Answer the questions below for the jobs you are to perform on site. If a 'Yes' response is checked, consult with an HSE Manager or a URS Certified Industrial Hygienist (CIH) to determine if a respirator is truly needed for the job; and if so, the type of respirator needed.

It is important to be aware of the respiratory protection requirements for any chemicals you are exposed to; these can be found on the Material Safety Data Sheets or chemical labels.

Material Used or Process to be Performed	Notes
Abrasive Blasting <ul style="list-style-type: none">Abrasive blasting (with any type of grit or material) will be performed <input type="checkbox"/> Yes <input type="checkbox"/> No _____Employee will fill abrasive blasting pots or perform clean-up activities <input type="checkbox"/> Yes <input type="checkbox"/> No _____Employee will be in a contained area where abrasive blasting is taking place <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Acids <ul style="list-style-type: none">Liquid or powder acids will be used in a situation where acid vapors, mists, or dust may be breathed <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Adhesives <ul style="list-style-type: none">Aerosols-propelled adhesives are to be used in areas where there is insufficient or no local exhaust ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No _____Two-part adhesives (mix part one with two, let set, then use) are to be used in areas where there is limited ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Alkalis/Bases/Caustics <ul style="list-style-type: none">Powdered alkalis will be used in a situation where an airborne dust may be breathed <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Asbestos Abatement <ul style="list-style-type: none">Asbestos will be removed, repaired, or sampled <input type="checkbox"/> Yes <input type="checkbox"/> No _____Employees will be inspecting or overseeing areas where asbestos will be removed or disturbed <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Cleaning Compounds <ul style="list-style-type: none">Degreasers or carbon removers will be used in areas where local exhaust ventilation is not provided <input type="checkbox"/> Yes <input type="checkbox"/> No _____Aerosol-propelled cleaning compounds will be used in areas where there is no local exhaust ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No _____Entry into a vault, tank, silo, sewer, or other confined space that has been used for chemical storage, recently painted, or where inert gases may have been used without ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No _____Degreasers or carbon removers will be used in voids, tanks, or other confined spaces <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Corrosion-Preventive Compounds <ul style="list-style-type: none">Corrosion-prevention compounds, including chemical conversion compounds and corrosion inhibitors, will be used in areas where there is no local exhaust ventilation <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
Detergents/Soaps <ul style="list-style-type: none">Ammonia-based detergents will be used in large quantities (more than 5 gallons) in areas where local exhaust ventilation cannot be <input type="checkbox"/> Yes <input type="checkbox"/> No _____	



Health, Safety and Environment
IDENTIFYING WHEN A RESPIRATOR
IS NEEDED

Attachment 042-1 NA

Issue Date: July 2000
Revision 5: August 2010

Material Used or Process to be Performed	Notes
provided <ul style="list-style-type: none">Large quantities (5- or 55-gallon containers) of high pH powder detergent/soap will be used in a situation where dust may be breathed	<input type="checkbox"/> Yes <input type="checkbox"/> No _____
Fuels (including regular or unleaded gasoline, kerosene, diesel fuel, JP-5) <ul style="list-style-type: none">Employees will be inside unventilated fuel cells or other confined spaces containing fuels	<input type="checkbox"/> Yes <input type="checkbox"/> No _____
Grinding, Cutting, Sanding <ul style="list-style-type: none">Cutting, grinding, or sanding surfaces that have coatings containing beryllium, cadmium, chromium, lead, or zincCutting, grinding, or sanding surfaces that are concrete or glass without use of ventilation or water	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____
Hazardous Waste Sites <ul style="list-style-type: none">Employees will be performing tasks on a hazardous waste site that requires the use of respirator (as indicated in the site health and safety plan)Employees will be performing site assessments on potential hazardous waste sites	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____
Hydraulic Fluids (including petroleum-based fluids, synthetic fire-resistant fluids, and water-based fire-resistant fluids) <ul style="list-style-type: none">Hydraulic fluids and the vapors generated will not be exhausted using local exhaust ventilationSynthetic fire-resistant fluids or water-based fire-resistant fluids will be used in an area where the air is contaminated with visible mist or spray from hydraulic fluids	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____
Inspection Penetrants (including Fluoro-finder, water-indicating pastes, and penetrant removers) <ul style="list-style-type: none">An aerosol-propelled inspection penetrant will be used in an area where local exhaust ventilation cannot be provided, or in a situation where the solvent vapors can be breathed	<input type="checkbox"/> Yes <input type="checkbox"/> No _____
Lead Abatement Activities <ul style="list-style-type: none">Lead-containing materials will be disturbed, removed, or sampledEmployees will be inspecting or overseeing areas where lead will be removed or disturbed	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____
Lubricants/Oils <ul style="list-style-type: none">Aerosol lubricants or oils will be sprayed with no immediate exhaust ventilation	<input type="checkbox"/> Yes <input type="checkbox"/> No _____
Oxidizers (materials that give off oxygen, including chlorine laundry bleach, calcium hypochlorite, calcium oxide, oxygen candles, lithium hydroxide, hydrogen peroxide, and sodium dichromate) <ul style="list-style-type: none">Oxidizers containing organic chlorine will be used in a situation where the dusts or vapors may be breathedPowdered oxidizers will be used in a situation where airborne dust may be breathed	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____
Paint Materials (including paints, primers, thinners, enamels, lacquers, strippers, coatings, and varnishes) <ul style="list-style-type: none">Paint materials will be spray-applied in areas where there is no local exhaust ventilationTwo-part (mix part a with part b, let set, then apply) polyurethane or epoxy polyamide paints will be brush- or spray-applied	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ <input type="checkbox"/> Yes <input type="checkbox"/> No _____



Health, Safety and Environment
IDENTIFYING WHEN A RESPIRATOR
IS NEEDED

Attachment 042-1 NA

Issue Date: July 2000
Revision 5: August 2010

Material Used or Process to be Performed	Notes
<ul style="list-style-type: none">• Paints containing beryllium, cadmium, chromium, lead, or zinc (refer to the MSDS) <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Paint materials will be applied in confined spaces <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>Solvents (including hydrocarbon solvents such as acetone, methyl ethyl ketone, toluene, xylene, and alcohols, as well as mixed solutions like antifreeze, heat-transfer fluid, turpentine, pipe-dope, and naphtha thinner)</p> <ul style="list-style-type: none">• Local exhaust ventilation will not be provided and work will involve breathing solvent vapors <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Solvents will be used within confined spaces <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Solvents will be applied using aerosols <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>Thermal Insulation (including asbestos and non-asbestos materials like pipe lagging, fiberglass insulation, boiler insulation, packing materials, and floor or ceiling tiles)</p> <ul style="list-style-type: none">• Insulation will be disturbed, removed, or sampled <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>Water-Treatment Chemicals (includes corrosive chemicals such as tri-sodium phosphate, hardness buffer, titrating solution, morpholine, caustic soda, citric acid, and nitric acid, as well as toxic chemicals such as mercuric nitrate, hydrazine, EDTA, and sodium nitrate)</p> <ul style="list-style-type: none">• Morpholine, EDTA, or harness buffer/titrating solution is to be used in poorly ventilated spaces <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Powdered water-treatment chemicals will be used in a situation where chemical dusts may be breathed <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>Welding/Brazing/Cutting</p> <ul style="list-style-type: none">• Welding will be performed in confined spaces <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Welding galvanized metal or stainless steel <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Brazing with cadmium or lead <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Torch-cutting on coated/painted materials <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>For Any of the Above-Listed Activities</p> <ul style="list-style-type: none">• An employee will be in the immediate area – within 10 feet of the job or operation; or <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Employee will be inside confined space where activities are taking place; or <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Employee will be inside a “controlled area” such as found in asbestos abatement, lead abatement, radiation control area, or a hazardous waste site <input type="checkbox"/> Yes <input type="checkbox"/> No _____	
<p>Other</p> <ul style="list-style-type: none">• A chemical process procedure (e.g., hydrogen sulfide in refineries, ammonia as a refrigerant, chlorine in water disinfection, inert gas systems) required the use of a respirator or emergency escape respirator <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Mine operations require issuance of an emergency escape respirator <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Emergency response plan requires issuance of respirators to first responders <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Radiological controls require use of a respirator <input type="checkbox"/> Yes <input type="checkbox"/> No _____• Laboratory Chemical Hygiene plan requires issuance of respirators <input type="checkbox"/> Yes <input type="checkbox"/> No _____	



Health, Safety and Environment
VOLUNTARY USE OF RESPIRATORS

Attachment 042-2 NA
Issue Date: July 2000
Revision 5: August 2010

Instructions: Have the employee that is opting to use a respirator for non-overexposure conditions read this page, and then sign on the bottom of the page. Maintain a copy in the employee's training file.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for employees. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the employee.

Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of the hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your own voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not pose a hazard.

1. Read and follow all instructions provided by the manufacture on use, maintenance, cleaning, and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH (the National Institute for Occupational Safety and Health) certifies respirators in the U.S. A label or statement of certification should appear on the respirator or respirator packaging; it will tell you what the respirator is designed for and how it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants against which your respirator is not designed to protect. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, fumes, smoke, or very small solid particles.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. If you have any health conditions (asthma; high blood pressure; emphysema; heart disease) that could be aggravated by using a respirator, you should check with your doctor before using one.

I have read and understand this information: Date:

Employee's Name (Please Print):

Employee's Signature:



FIT TEST RECORD

Employee Name _____ Employee Number _____

Office/Project _____ Last Medical Exam _____

Fit Test Date _____ Corrective Lenses Needed Yes [] No []

Medically qualified to wear respirator? Yes [] No []

Briefed on fundamental principles of respiratory protection, use, selection, inspection, cleaning, maintenance, and storage of equipment? Yes [] No []

Test agent recognition: Yes [] No [] N/A []

RESPIRATOR 1

RESPIRATOR 2

RESPIRATOR 3

Equipment Type _____

Manufacturer's Name _____

Model _____

Size _____

Facepiece Composition (Rubber/Silicone) _____

TEST PERFORMED

RESPIRATOR 1

RESPIRATOR 2

RESPIRATOR 3

Negative Pressure Test: Pass [] Fail []

Positive Pressure Test: Pass [] Fail []

Isoamyl Acetate Test: Pass [] Fail []

Irritant Smoke Test: Pass [] Fail []

Bitrex: Pass [] Fail []

Saccharin: Pass [] Fail []

Generated Aerosol Quantitative Fit: P [] F [] Fit Factor _____

Ambient Aerosol Quantitative Fit: P [] F [] Fit Factor _____

Controlled Negative Pressure Quantitative Fit: P [] F [] Fit Factor _____

Examiner's Name (Please Print)

Examiner's Signature

Date

Employee's Signature

Date

URS	Health, Safety and Environment RESPIRATOR STANDARD OPERATING PROCEDURE	Attachment 042-4 NA Issue Date: July 2000 Revision 5: August 2010
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Job Task Reviewed: _____

Date Reviewed: _____

Task Review by: _____

ADMINISTRATIVE PROCEDURES

1. All respirator users must be medically qualified to use respirators.
2. Respirator users must be trained annually in respirator use, and must be fit-tested annually.
3. The respirator will be used only by the person to whom it was issued.
4. Persons using glasses who are required to use a full-face respirator may use contact lenses or eyeglass inserts designed for the respirator.

GUIDANCE FOR SELECTION OF RESPIRATOR AND CARTRIDGES/FILTERS

1. Respirators are currently being issued and used for the following job activities:

2. The respirator will be equipped with the following cartridges/filters:

3. Filters are to be changed when the breathing resistance increases.
4. Cartridges are to be changed _____ (frequency), or when the contaminant you are protecting yourself from can be smelled or tasted.

FIT TESTING & FIT CHECKING

1. Fit testing is required annually. To arrange for fit testing, call your local, project, or regional safety representative or qualified industrial hygienist.
2. Respirator users will “fit check” the respirator every time the respirator is put on:
 - **Negative Check** – Cover filters/cartridges with palms of hands and breath in: leakage should not be detected around the face seal of the respirator. Do not use if leakage is detected.
 - **Positive Check** – Cover the exhalation valve cover with palm of hand and blow out slightly: leakage should not be detected around the respirator seal.
 - **For Air Supply Respirators** – Kink or close off air supply hose and breath in: leakage should not be detected around the face seal of the respirator.

CLEANING AND MAINTENANCE OF RESPIRATOR

1. Clean and disinfect respirator after every use.
2. Inspect respirator at the end of work every day in use to ensure parts are not missing. Replace missing parts from stock supply.
3. Store clean respirator in labeled plastic bag out of direct sunlight.
4. Do not alter respirator in any way.

A cartridge change schedule must be developed for cartridges or canisters used with air purifying respirators that do not have an End of Service Life Indicator (ESLI). The purpose of this is to prevent contaminants from breaking through the respirator's sorbent cartridge(s), and thereby over-exposing employees. NIOSH has approved ESLIs for only four cartridges or canisters (mercury vapor, carbon monoxide, ethylene oxide, and hydrogen sulfide). Historically we have relied on the warning properties (odor, irritation) of a contaminant to dictate cartridge change. OSHA no longer allows this as the sole basis for changing respirator cartridges. In developing a change schedule the following factors should be considered:

- Contaminants
- Concentration
- Frequency of use (continuously or intermittently throughout the shift)
- Temperature and humidity
- Work rate
- The presence of potentially interfering chemicals.

The worst-case conditions should be assumed to avoid early breakthrough. This must be documented in the project health and safety plan or, in the cases of office or labs, in the site specific Respiratory Protection Program.

Sources of Help

OSHA provides assistance in developing respirator cartridge change schedules on its website at http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html.

Most cartridge manufacturers maintain on-line interactive cartridge service life programs that can be used to evaluate the service life against many contaminants. Typically, these do not evaluate the service life against mixtures (multiple contaminants).

Because of the complexity in evaluating mixtures, OSHA offers the following guidance:

- When the individual compounds in the mixture have similar breakthrough times (i.e., within one order of magnitude), service life of the cartridge should be established assuming the mixture stream behaves as a pure system of the most rapidly migrating component with the shortest breakthrough time (i.e., sum up the concentration of the components).
- Where the individual compounds in the mixture vary by 2 orders of magnitude or greater, the service life may be based on the contaminant with the shortest breakthrough time.

Rule of Thumb (*"The Occupational Environment" - Its Evaluation and Control*)

- If the chemical's boiling point is >70 °C and the concentration is less than 200 ppm, you can expect a service life of 8 hours at a normal work rate.
- Service life is inversely proportional to work rate.
- Reducing concentration by a factor of 10 will increase service life by a factor of 5.
- Humidity above 85% will reduce service life by 50%.

OSHA Interpretation

The OSHA inspection procedures for the respiratory protection standard specifies that where contaminant migration is possible, respirator cartridges/canisters should be changed after each work shift where exposure occurs unless there is objective data to the contrary (description studies) showing the performance in the conditions and schedule of use/non-use found in the workplace.

- A. A hazard analysis of the workplace must be performed before selecting respirators. The analysis must consider inhalation hazards under routine and foreseeable emergency conditions. Other factors to consider when choosing respirators include skin and eye exposure, the effects of heat or cold, use of protective clothing, employee conditioning, and workload.
- B. Respiratory hazards that must be identified include:
1. Oxygen Deficiency
 2. Air Contaminants
 3. Particulates
 4. Toxic Gases

C. Evaluating Exposures

There are several options on how to evaluate exposures:

1. One option is to rely on personal monitoring data of employees. Representative exposure data provided by industry or laboratory studies is acceptable as long as it applies to similar tasks and conditions at the worksite.
2. The professional judgment provided by the Business, RBU, SBU, Office, or Project HSE Manager and/or as recommended by a qualified industrial hygienist or safety professional may be employed for the task.
3. If the exposure cannot be identified or estimated, then the atmosphere is considered immediately dangerous to life or health (IDLH). Atmospheres with levels of oxygen below 19.5% are also defined as IDLH.
4. Trained and qualified technical personnel shall perform assessment of the degree of respiratory hazard through sampling and testing of the work environment. Problems requiring special respiratory protection should be discussed with the Business or Regional HSE Manager or qualified industrial hygienist.
5. The Project HSE Manager shall establish procedures to control respiratory hazards through engineering or administrative controls, product/material substitution, respiratory protective devices, or a combination of these methods.
6. He/she shall also perform annual evaluations of the effectiveness of the project's respiratory protection program. These evaluations shall be documented.
7. The Project HSE Manager shall select and provide adequate respiratory protective devices for use on the project. This selection shall be based upon the specific type of air contaminant(s), the concentration of the contaminants(s) or oxygen deficiency in the work environment.
8. Establish a change schedule for air-purifying respirators based upon objective information or data that will ensure that cartridges are changed before the end of their useful life. OSHA has mandated that reliance on warning properties is no longer valid

- A. A quantitative fit-test provides the most accurate information; qualitative fit testing depends on the respirator wearer's sense of smell and taste (subjective response). OSHA's standard requires fit-testing for any face mask (full or half) designed to have a tight seal along the face, whether it is used in a positive or negative pressure mode, and whether it is disposable or not. If the required fit factor is greater than 100, then a quantitative fit-test must be performed.
- B. Each person will have a qualitative or quantitative fit test when first required to wear a respirator, every 12 months when respirators will be worn thereafter, or as hazards or respiratory needs change.
- C. Each person will have a qualitative or quantitative fit test for each specific make(s) and model(s) of respirator(s) for which the worker may wear.
- D. Under no circumstances shall a worker be allowed to use any respirator if the results of the qualitative fit test indicate that the worker is unable to obtain a satisfactory seal.
- E. The eight exercises required by OSHA under the respiratory protection standard, 29 CFR 1910.134, Appendix A, are as follows (note that these are not required controlled negative pressure (CNP) quantitative fit testing):
1. normal breathing
 2. deep breathing
 3. head side to side
 4. head up and down
 5. talking out loud
 6. grimacing (quantitative only)
 7. bending
 8. normal breathing
- F. Qualitative and quantitative fit testing must be performed in negative pressure mode for all tight fitting respirators, whether the respirator is positive or negative pressure demand.
- G. Qualitative and quantitative fit testing must be conducted according to one of the protocols found in 29 CFR 1910.134, Appendix A.
- H. Employees using respirators when not required under the standard (i.e., dust masks or comfort masks for nuisance type dust without a specified exposure level) must be aware of the potential hazards of using a respirator. See Attachment 042-2 of this standard or Appendix D of 29 CRF 1910.134 for information program requirement.

- A. Physical characteristics, functional capabilities, and performance limitations of various types of respirators shall be considered in the selection process.
- B. Specifics regarding hazard classification, descriptions of respirator types and modes of operation, and the capabilities and limitations of respirators are listed in ANSIZ88.2-1992.
- C. To select the correct respirator, the hazards must first be identified in the workplace and then follow these steps:
 1. Determine if the environment is IDLH.
 - a. All oxygen deficient atmospheres shall be considered IDLH.
 - b. If the employee exposure cannot be reasonably estimated, the atmosphere must be considered IDLH.
 2. Identify the contaminant(s) present in the atmosphere and answer the following questions:
 - a. What is the concentration?
 - b. Are they gaseous or particulate?
 - c. Are the contaminants IDLH?
 3. After completing the above steps select the appropriate respirator for the particular hazard(s).
 - a. IDLH – Provide a full facepiece NIOSH certified pressure demand SCBA with a minimum service life of 30 minutes or a full facepiece pressure demand airline respirator with an auxiliary self-contained air supply.
 - b. Non-IDLH – A respirator must be provided that is appropriate for the contaminant(s) identified.
 4. For protection against gases and vapors, either an atmosphere-supplying respirator or an air-purifying respirator equipped with a NIOSH certified end-of-service-life indicator (ESLI) for the contaminant must be used. In lieu of an ESLI, a change schedule for cartridges based on objective information or data may be used to ensure cartridges are changed before the end of their service life occurs (see Supplemental Information A). In most cases, respirator cartridge manufacturers provide a product specific on-line or CD-ROM based “Service Life Calculator” that allows determination of useful service life of a cartridge based on expected concentration and environmental and work conditions. If neither an ESLI or change schedule is available, a supplied air respirator must be used.
 5. For protection against particulates, an atmosphere-supplying respirator or an air-purifying respirator equipped with a NIOSH-certified high-efficiency particulate air (HEPA) filter under 30 CFR 11 or an air-purifying respirator equipped with a NIOSH certified filter for particulates under 42 CFR 84 must be used.

6. There are three classes of filters under NIOSH (N, R, and P series) with three levels of filter efficiency in each class – 95%, 99%, and 99.97% (classified as 100). All filters can be used regardless of aerosol size. The new filters are classified as follows:
 - a. N – For solid particulates and non-oil aerosols that do not degrade filter performance.
 - b. R – For solid particulates and degrading oil-based aerosols. R filters have “use limitations.”
 - c. P – For solid particulates and degrading oil-based aerosols. P filters generally have no “use limitations” other than those normally associated with particulate filters. The P100 filter is the replacement for the HEPA filter.
- E. Particulate filters are tested with 200 mg of loading but in many cases, these filters may exceed this capacity. Filtration efficiency may actually increase as the filter cake develops on the filter. Increased resistance to breathing or obvious taste or odor in the respirator would be cause to examine, re-evaluate and replace the filter cartridge

A. Inspection

Routinely used air-purifying and airline respirators should be checked as follows before and after each use:

1. Examine the facepiece for:
 - a. Excessive dirt.
 - b. Cracks, tears, holes or physical distortions of shape from improper storage.
 - c. Inflexibility of rubber facepiece (stretch and knead to restore flexibility).
 - d. Cracked or badly scratched lenses in full facepieces.
 - e. Incorrectly mounted full facepiece lenses, or broken or missing mounting clips.
 - f. Cracked or broken air-purifying element holder(s), badly worn threads or missing gasket(s) if required.
2. Examine the head straps or head harness for:
 - a. Breaks.
 - b. Loss of elasticity.
 - c. Broken or malfunctioning buckles and attachments.
 - d. Excessively worn serrations on head harness, which might permit slippage (full facepieces only).
3. Examine the exhalation valve for the following after removing its cover:
 - a. Foreign material, such as detergent residue, dust particles or human hair under the valve seat.
 - b. Cracks, tears or distortion in the valve material.
 - c. Improper insertion of the valve body in the facepieces.
 - d. Cracks, breaks or chips in the valve body, particularly in the sealing surface.
 - e. Missing or defective valve cover.
 - f. Improper installation of the valve in the valve body.
4. Examine the air-purifying element for:
 - a. Incorrect cartridge, canister, or filter for the hazard.
 - b. Incorrect installation, loose connections, missing or worn gasket or cross threading in the holder.
 - c. Expired shelf-life date on the cartridge or canister.
 - d. Cracks or dents in the outside case of the filter, cartridge or canister, indicated by the absence of sealing material, tape, foil, etc., over the inlet.
5. If the device has a corrugated breathing tube, examine it for:

- a. Broken or missing and connectors.
 - b. Missing or loose hose clamps.
 - c. Deterioration, determined by stretching the tube and looking for cracks.
6. Examine the harness of a front-or back-mounted gas mask for:
- a. Damage or wear to the canister holder, which may prevent its being held in place.
 - b. Broken harness straps for fastening.

B. Self Contained Breathing Apparatus (SCBA)

Follow manufacturer specifications for storage, maintenance and cleaning of SCBA systems.

C. Manual Cleaning

A generalized cleaning procedure is typically found in the manufacturer's manual. Read the respirator manual and follow the manufacturer's recommendations.

1. Remove canisters, filters, valves, straps and speaking diaphragms from the facepiece.
2. Wash facepiece and accessories in warm soapy water or a commercially available cleaner, following the manufacturer's instructions. Gently scrub the respirator.
3. Rinse parts thoroughly in clean water.
4. Air dry in a clean place or wipe dry with a lint less cloth.

D. Machine Cleaning

Machines may be used to expedite the cleaning, sanitizing, rinsing, and drying of large numbers of respirators. Read the machine-cleaning manual and follow manufacturer's recommendations.

1. Extreme care must be taken to ensure against excessive tumbling and agitation, or exposure to temperatures above those recommended by the manufacturer (normally 120°F maximum), as these conditions are likely to result in damage to the respirators.
2. Ultrasonic cleaners, clothes-washing machines, dishwashers, and clothes dryers have been specially adapted and successfully used for cleaning and drying respirators.

E. Disinfection

1. Disinfection is required when more than one person uses the respirator. Recommended NIOSH disinfection procedures include immersion of the respirator body for two minutes in a 50 ppm chlorine solution (about 2 ml bleach to 1 liter of water). Rinse thoroughly in clean water and dry.
 - a. Immersion times have to be limited to minimize damage to respirators. The solutions can age rubber and rust metal parts. Caution must be

taken to thoroughly rinse the respirator after cleaning and disinfection to prevent dermatitis.

- b. An alternate method is to purchase a commercially prepared solution for disinfection/decontamination and follow the directions recommended by the manufacturer.
2. Each person wearing a respirator shall examine the respirator before use in accordance with the training and instruction provided during fit testing.
3. After cleaning and sanitizing, each respirator shall be examined to determine if it is in proper working condition, if it needs replacement of parts or repairs, or if it should be discarded. Respirator inspection shall include, when applicable, a check for tightness of connections; for the condition of the respiratory inlet covering, head harness, valves, connecting tubes, harness assemblies, filters, cartridges, canisters, end-of-service life indicator, and shelf life date(s), and for the proper function of regulators, alarms, and other warning systems.
4. Each rubber or other elastomeric part shall be inspected for pliability and signs of deterioration. Each air and oxygen cylinder shall be inspected to ensure that it is fully charged according to the manufacturer's instructions.

F. Repair

Only persons trained in proper respirator assembly and correction of possible respirator malfunctions and defects shall do replacement of parts or repairs. Replacement parts shall be only those designed for the specific respirator being repaired. Reducing or admission valves, regulators, and alarms shall be returned to the manufacturer for repair or adjustment. The valve, regulator, or alarm manufacturer must approve instrumentation for valve, regulator, and alarm adjustments and tests.

G. Storage

Respirators shall be stored in a convenient, clean and sanitary location. The purpose of good respirator storage is to ensure that the respirators will function properly when used. Respirators shall be stored in a manner that will protect them against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators shall be stored to prevent distortion of rubber or other elastomeric parts. This can be done by storing the respirators in hermetically sealed plastic bags, or plastic bags capable of being sealed. Emergency and rescue use respirators that are placed in work areas shall be quickly accessible at all times, and the storage cabinet or container in which they are stored shall be clearly marked.

**URS SAFETY MANAGEMENT STANDARD 043
PERSONAL MONITORING (INDUSTRIAL HYGIENE)**

URS SAFETY MANAGEMENT STANDARD

Personal Monitoring (Industrial Hygiene)

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies where employees may be exposed to airborne concentrations of hazardous air contaminants potentially exceeding permissible limits. Note that this standard does not cover monitoring for asbestos operations (SMS 008 – Asbestos Operations), hexavalent chromium (SMS 083 – Chromium (VI) Inhalation Exposure Protections), confined spaces (SMS 010 – Confined Space), heat stress (SMS 018 – Heat Stress), or noise (SMS 026 – Noise and Hearing Conservation).

2. Purpose and Scope

The purpose of this standard is to assist and provide guidance to URS personnel who need to conduct personal industrial hygiene monitoring. Monitoring will be conducted to evaluate the exposures of URS employees to concentrations of toxic particulates, fibers, gases, vapors, mists, radionuclides, pathogens, hazardous biological agents, or to oxygen-deficient atmospheres.

Personal monitoring must be conducted under the following conditions:

- A. Where directed by a facility or site-specific health and safety plan.
- B. Where employees are exposed to known or suspected human carcinogens (e.g., beryllium, vinyl chloride, etc.).
- C. Where regulations require "initial exposure assessments" (e.g., lead, asbestos, methylene chloride, hexavalent chromium). The only exception to conducting an "initial exposure assessment" where there is a regulatory requirement to do so is when similar exposure assessments have been conducted under similar site conditions within 1 year prior to the start of work on the current project or site.
- D. When directed by a client or required by contract.
- E. At the direction of a Health, Safety, and Environment (HSE) Manager in response to employee concerns or incidents involving chemical exposure.
- F. Co-sampling during regulatory inspections.
- G. Routine monitoring in compliance with regulatory requirements.

URS SAFETY MANAGEMENT STANDARD

Personal Monitoring (Industrial Hygiene)

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Procedures for Personal Industrial Hygiene Monitoring

1. Calibrate sampling equipment in accordance with the manufacturer's recommendations and the approved sampling methodology.
2. Collect samples using the most current applicable methodologies established by either the National Institute for Occupational Safety and Health (NIOSH) *annual occupational method*, U.S. Department of Labor – Occupational Safety and Health Administration (OSHA) *amplified and analytical methods*, or applicable guidelines for the host country.
3. Select an analytical laboratory accredited by the American Industrial Hygiene Association (AIHA), or equivalent host country certification, licensing, or accreditation, to analyze the personal air samples.

Note: There are several programs under which a laboratory may receive AIHA accreditation. The laboratory must be currently accredited for the specific program, scope category, and field of testing for the analysis that will be performed, not merely hold AIHA accreditation.

4. Require the selected laboratory to use the applicable analytical methodologies and document quality control procedures.
5. Ensure equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.
6. Document personal monitoring activities using the appropriate URS Industrial Hygiene Monitoring Form; require that all laboratory chain-of-custody forms be properly completed; and ensure samples are sealed and secured according to Quality Assurance procedures.

URS SAFETY MANAGEMENT STANDARD
Personal Monitoring (Industrial Hygiene)

7. Ensure workers are being protected (e.g., engineering controls, respiratory protection, PPE) during the monitoring phase. Determine whether medical surveillance is required.

B. Evaluation of Personal Monitoring Results

1. Where feasible, require that a URS Certified Industrial Hygienist (CIH) approved by an HSE Manager evaluate the analytical results.
2. Obtain a written evaluation report from the HSE manager. If exposures exceed the Action Level and/or Permissible Exposure Limit for the air contaminant(s) of concern, a verbal report is to be made to the senior facility, project, or site manager immediately, and the evaluation report will include required corrective actions.
3. Complete evaluation reports within 5 working days of the receipt of the analytical results.

C. Procedures for Direct-Read Air Monitoring

1. Direct-read air monitoring instruments are used primarily as screening tools to provide real-time evaluations of hazardous airborne contaminants at a project site.
2. Select an appropriate air monitor for the air contaminant to be measured.
3. Calibrate monitor in accordance with manufacturer's recommendations. Dates of full instrument calibration will be recorded on the direct-read instrument and on any associated calibration data sheets. If full instrument calibrations are not performed daily, then bump tests (exposure to a known concentration of contaminant) will be performed to verify calibration and ensure alarms are working appropriately.
4. Conduct air monitoring using techniques identified by the instrument manufacturer.
5. Ensure equipment is maintained, serviced, and calibrated in accordance with manufacturer's recommendations.
6. Document personal monitoring activities using the appropriate URS Industrial Hygiene Monitoring Form.

URS SAFETY MANAGEMENT STANDARD

Personal Monitoring (Industrial Hygiene)

7. Ensure workers are being protected (e.g., engineering controls, respiratory protection, PPE) during the monitoring phase. Determine whether medical surveillance is required.
8. Where required by client request or by unique or high hazard areas, individual portable direct-read monitors shall be used.

D. Evaluation of Personal Monitoring Results

1. Compare measured results with project-specific Action Levels and/or published Permissible Exposure Limits. If exposures exceed the Action Level and/or Permissible Exposure Limit for the air contaminant(s) of concern, take corrective actions as identified in the site-specific health and safety plan. Where questions exist about the results, contact a CIH approved by an HSE Manager to evaluate the analytical results.

E. Communication of Sample Results and Evaluation

1. Provide copies of the evaluation report to the employee(s) monitored and to employees working in the area for which the exposures could be representative, within 5 days of receipt of lab results.
2. Provide a copy of the evaluation report and monitoring data to the manager directing activities of the facility or site for filing purposes.
3. Personal identifiers (e.g., name, address, employee number) or information which could reasonably be used to identify specific employees (e.g., exact age, height, weight, race, sex, date of initial employment, job title), must be removed from analysis reports before access to the exposure data is provided.

F. Corrective Actions

Implement required corrective actions immediately. If workers are being exposed above the PEL, respiratory protection should be worn in accordance with SMS 042 – Respiratory Protection. Engineering controls should be used to reduce exposures to the extent possible

G. Exposure Records

1. Exposure records include workplace monitoring, biological monitoring, material safety data sheets and chemical inventories. Sampling results, the collection methodology (sampling plan), a

URS SAFETY MANAGEMENT STANDARD

Personal Monitoring (Industrial Hygiene)

description of the analytical and mathematical methods used, and a summary of other background data relevant to interpretation of the results obtained, must be retained for at least thirty (30) years.

5. Documentation Summary

The following documents will be maintained in the project profile:

- A. Calibration data.
- B. Completed IH Monitoring Form(s).
- C. Evaluation Report with sample results (provide copy to affected employee as well).
- D. Relevant prior initial exposure assessments.

6. Resources

- A. [OSHA Sampling and Analytical Methods](#)
- B. [OSHA Chemical Sampling Information](#)
- C. [American Industrial Hygiene Association – The Occupational Environment: Its Evaluation and Control](#)
- D. [American Conference of Governmental Industrial Hygienists – Air Sampling Instruments for Evaluation of Atmospheric Contaminants](#)
- E. [NIOSH Manual of Analytical Methods](#)
- F. [SMS 008](#) – Asbestos Operations
- G. [SMS 010](#) – Confined Space
- H. [SMS 018](#) – Heat Stress
- I. [SMS 026](#) – Noise and Hearing Conservation
- J. [SMS 042](#) – Respiratory Protection
- K. [SMS 050](#) – Toxic and Hazardous Substances
- L. [Attachment 043-1 NA](#) – General Industrial Hygiene Survey Form
- M. [Attachment 043-2 NA](#) – Industrial Hygiene Sample Field Sheet

URS SAFETY MANAGEMENT STANDARD
Personal Monitoring (Industrial Hygiene)

- N. [Attachment 043-3 NA](#) – Total Dust Industrial Hygiene Sample Field Sheet
- O. [Attachment 043-4 NA](#) – Respirable Dust Industrial Hygiene Sample Summary
- P. [Attachment 043-5 NA](#) – Detector Tube Industrial Hygiene Sample Summary
- Q. [Attachment 043-6 NA](#) – Gas/Vapor/Fume/Mist Industrial Hygiene Sample Summary
- R. [Attachment 043-7 NA](#) – Combustible Gas Monitor Industrial Hygiene Sample Summary
- S. [Attachment 043-8 NA](#) – PID/FID Monitoring Report



**INDUSTRIAL HYGIENE
SAMPLE FIELD SHEET**

Sample ID

Date: _____

Material of Interest (MOI) in Dust: _____

Site: _____ Sample I.D. No. _____

Person Sampled or Area: _____ Employee No. _____

Job/Area: _____

Sample Type

Personal: Area: Resp. Dust: Total Dust: Other: _____

Pump Type: _____ Pump No _____ Time On: _____ Time Off: _____

Total Time (min): _____ Cassette No: _____ Initial Flow: _____ Final Flow: _____

Average Flow: _____ Volume: _____ Calibrator Model: _____ Calibrator Serial No: _____

Workplace Conditions

Operations: Normal Abnormal Explain _____

Respirator Use: Type _____ % of Time Worn _____

Ventilation: Type _____

Normal Abnormal Explain _____

Weather Conditions

Approximate Temperature: _____ °F _____ °C

Sky: Precipitation Cloudy Partly Cloudy Clear

Wind: Calm Light Medium High

Work Description/Comments:

Scheduled Hours per Shift: _____

Sampled By: _____

**URS SAFETY MANAGEMENT STANDARD 046
SUBCONTRACTOR HEALTH AND SAFETY REQUIREMENTS**

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

1. Applicability

This standard is applicable to subcontractors retained by the Infrastructure & Environment and Federal Services businesses of URS Corporation and its subsidiary companies that perform:

- Intrinsically higher-risk construction-related activities (e.g., drilling, excavation, surveying, demolition, electrical contracting, steel erection etc.).
- Significant building or infrastructure alteration, demolition, and/or repair activities using their own workforce or equipment.
- Activities on hazardous waste sites.
- Activities in government services operations (e.g., aviation repair, vehicle repair, warehousing, facility operations, and maintenance) where the annual cost of the subcontract exceeds \$1,000,000.
- An activity where URS Corporation does not supervise the day-to-day activities and work efforts of subcontractor workers, **and** the subcontractor has a designated Supervisor on the work site.

This procedure is applicable to the operations of subcontractors and sub-subcontractors of any tier.

This procedure does not apply to third-party contractor operations where there is no subcontract relationship between the contractor and URS. Health, Safety, and Environment issues regarding third-party contractor operations are governed by project-specific contracts, and are not covered by this standard.

2. Purpose and Scope

This procedure provides requirements on the pre-evaluation of subcontractor safety programs; contractual risk management; subcontractor safety performance on the job site; and the responsibilities of the Project Manager with respect to subcontractor jobsite safety performance.

Each URS subcontractor must be evaluated at least annually using Attachment 046-1 NA, "Subcontractor Safety Evaluation Form," or equivalent client or URS International Operations form, in order to perform work on any new URS projects.

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Pre-qualification of Subcontractor – The Project Manager will complete the following procedures for all subcontractors retained on projects covered by this standard (the PM should also require subcontractors to follow these procedures with respect to pre-qualification of sub-subcontractors of any tier):

1. Request all subcontractor candidates to complete the attached Subcontractor Safety Evaluation Form (Attachment 046-1 NA).
2. Conduct an assessment of each subcontractor's qualifications with respect to the subcontractor health and safety evaluation criteria contained in Attachment 046-2 NA.
3. If the subcontractor does not meet the criteria established in Attachment 046-2 NA, and URS must retain the contractor, the Subcontractor Variance Form (Attachment 046-3 NA) must be completed and approved by a Regional, or Strategic Business Unit (SBU) Health, Safety, and Environment (HSE) Manager.
4. Verify that subcontractors meet the insurance requirements as stated in URS' agreement with the subcontractor, or as approved by URS Legal Counsel or Contracting Manager/Officer.
5. If the subcontractor has been successfully evaluated within the last 12 months, that evaluation may be substituted.
6. For long-term operations, update this evaluation within 12 months of the previous evaluation.

B. Contractual and Risk Management Requirements of Subcontractors

1. Ensure that the subcontractor is contractually bound to comply with applicable client and URS HSE Program requirements.
2. Ensure that subcontractor is contractually bound to develop additional safety procedures for work that is exclusive to their activities on the site, and for which they may have superior knowledge.

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

3. Assess compliance of subcontractor's insurance with the URS Corporation subcontract requirements (including, but not limited to, necessary types and amounts of coverage, URS Corporation additional insured endorsement, etc.).
4. Ensure that URS has the right in its subcontract, without liability to URS, to stop the subcontractor's work in the event of any violations of the applicable Health and Safety Plan.

C. Subcontractor Safety Representative

1. Require each subcontractor to appoint a Subcontractor Safety Representative (SSR) who:
 - a. Is knowledgeable of the subcontractor's activities.
 - b. Understands the safety requirements of the subcontractor's activities.
 - c. Has the ability to recognize and the authority to correct safety deficiencies and execute a stop work order should an imminent danger arise.
 - d. Has the responsibility for the administration of the subcontractor Health and Safety Program.
 - e. Will serve as the direct contact with URS Corporation regarding resolution of health and safety issues.

D. Communication

1. Provide the SSR with information regarding Site Safety Program including but not limited to:
 - a. Client Requirements
 - b. URS HSE Program
 - c. Site Hazard Communication Program
 - d. Site Emergency Action Plan
 - e. Any additional safety information from other contractors or subcontractors working on the site.

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

2. Provide the SSR with the name of the URS project or site contact and alternate for addressing site health and safety issues.
 3. Require the participation of subcontractors in all Site Safety Briefings.
 4. Require subcontractor compliance with all safety directives and/or stop work orders issued by the URS site representatives.
 5. Require the subcontractor to notify the URS project or site manager when they will utilize short service employees (i.e., employees with less than six months of experience) to perform on-site activities. The URS project or site manager must approve the use of any short service employees by the subcontractor prior to mobilization. Site management will interact with the short service employee to verify their level of competency.
- E. Subcontractor Safety Performance
1. To the extent reasonable in light of URS' scope of work under the client contract, visit the site and periodically observe subcontractor's operations (i.e., conduct spot checks) to assess whether subcontractor appears to be conducting their operations in accordance with applicable health and safety requirements. Periodically review any required subcontractor health and safety written documentation for compliance with applicable requirements.
 2. In the event that unsafe acts or unsafe conditions are observed, immediately stop work, and bring them to the attention of the SSR for resolution.
 3. Investigate all injuries/illnesses related to subcontractor operations to identify causes and effect corrective actions.
 4. In the event of serious and/or continuing subcontractor breaches of applicable health and safety requirements, contact legal counsel to assess whether formal contractual action is appropriate under the subcontract.
 5. Once a job is completed, a subcontractor's safety performance should be reviewed and feedback provided to subcontractor management.
- F. Subcontractor Database
1. A database is available to store Attachment 046-1 NA completed by subcontractors. The database is available to all URS Lotus Notes users.

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

2. A RBU or Regional HSE Manager can upload completed Attachment 046-1 NA. Contact your Office HSE Representative or Regional HSE Manager for information on how to access the database.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Subcontractor Health and Safety Evaluation Form (Attachment 046-1 NA)
- B. Applicable and current Insurance Certificates
- C. Names and telephone numbers of SSR for each subcontractor
- D. Verification of Health and Safety documents transmitted to subcontractors and received from subcontractors
- E. Identified safety deficiencies as applicable for subcontractors and verification of correction of conditions
- F. All other safety related documentation between URS and subcontractor such as training certifications, etc.
- G. Subcontractor safety plan, incident reports, and resolution reports.

6. Resources

- A. "Occupational Injury and Illness Rates by SIC," Bureau of Labor Statistics, U. S. Department of Labor (<http://www.bls.gov/iif/oshsum.htm>)
- B. Managing Subcontractor Safety, Prepared by The Construction Industry Institute, Safety Task Force, Publication 13-1, The University of Texas at Austin, Austin, Texas, 1991 (<http://www.construction-institute.org/>)
- C. American National Standard Construction and Demolition Operations—Safety and Health Program Requirements for Multi-Employer Projects, ANSI A10.33-1992, National Safety Council, Itasca, Illinois 60143-3201 (<http://www.nsc.org>)
- D. "Liability, OSHA, and the Safety of Outside Contractors," Professional Safety, American Society of Safety Engineers, January 1993 (<http://www.asse.org>)

URS SAFETY MANAGEMENT STANDARD
Subcontractor Health and Safety Requirements

- E. "Proactive Construction Management; Dealing With the Problem of Subcontractor Safety," Professional Safety, American Society of Safety Engineers, January 1990 (<http://www.asse.org>)
- F. [Attachment 046-1 NA](#) – Subcontractor Safety Evaluation Form
- G. [Attachment 046-2 NA](#) – Subcontractor Evaluation Criteria
- H. [Attachment 046-3 NA](#) – Subcontractor Variance Form



Health, Safety and Environment
SUBCONTRACTOR SAFETY
EVALUATION FORM

Attachment 046-1 NA
 Issue Date: July 1999
 Revision 8: September 2011

It is the policy of URS to provide a safe and healthful environment for all of its employees through the prevention of occupational injuries and illnesses. As such, URS considers safety as paramount and requests the following information of all subcontractors.

Company Name: _____	Date: _____
Address: _____	Contact Name: _____
_____	Title: _____
City: _____	Telephone: _____
State/Province: _____	Fax: _____
Zip/Postal Code: _____	Email: _____

Type of services performed: _____

Has your company previously performed work as a subcontractor to URS? Yes No

If "Yes" explain the nature of the work, project location, and project date, and URS Project Manager and telephone number.

How many years has your organization been in business under your firm's name? _____

If applicable, what was your organization's previous name(s)? _____

1. WORKERS' COMPENSATION EXPERIENCE INFORMATION

(United States Only)

Insurance Carrier(s): _____

Contact for Insurance Information: _____

Title: _____ Telephone: _____ Fax: _____

A. For U.S. operations - List your firm's Interstate Worker Compensation Experience Modification Rate (EMR) for the three most recent years: (Information is available from your workers compensation insurance carrier.)

For international operations - List the applicable performance rating (e.g., NEER Performance Index in Canada) for your company.



SE

SE CONTRACTOR SAFETY EVALUATION FORM

Attachment NA

Issue Date: July
Revision: September

C. Has your company been issued any health and safety related citations/orders from any federal, state, province, or local regulatory agency during the past 5 years? Yes No

If Yes, please explain the nature of the citation/order, classification, and final fine (if applicable) in an attachment to your evaluation form submittal.

RISK MANAGEMENT INSURANCE DATA

A. Are you able to provide URS with insurance certificates naming URS, and if requested, URS' client as an additional insured? Yes No

Please provide proof of current Workers' Compensation and Employer's Liability Insurance coverage or proof of exemption. (For U.S. operations, attach certificate name in U.S. as additional insured).

HEALTH AND SAFETY PROGRAM

A. Does your company maintain a written Health and Safety program? Yes No
If Yes, please include a copy of the applicable contents.

B. Is your company capable of preparing safety procedures specific to the work proposed for this project? Yes No

C. Does your firm have a safety officer? Yes No
If Yes, please provide name and telephone number.

Name: Telephone:

D. Do you hold onsite safety meetings?

How often?

Daily Weekly Bi-Weekly Monthly Less often, As needed

E. Are the health and safety meetings documented? Yes No

F. Does your firm have the following policies/procedures? If Yes, please provide copies of the policies/procedures.

- Stop Work? Yes No
Short Service Employee? Yes No
Fitness for duty? Yes No

G. Is a program in place for the reporting and correction of workplace hazards? Yes No

H. Are workers encouraged to intervene when unsafe conditions are observed? Yes No



CONTRACTOR SAFETY
**SAFETY
 EVALUATION FORM**

Attachment 000-NA

Issue Date: July 0000
 Revision 0 September 0000

H. Have the safety and health hazards associated with your job activities been identified? Yes No

Has a risk assessment been performed on these hazards? Yes No

ACCIDENT INCIDENT REPORTING INVESTIGATION AND INCURR MANAGEMENT

A. Does your company have a process in place for immediate reporting, investigation, and follow-up of incidents, near-misses and occupational injuries? Yes No

If yes, who receives copies of the report? (Job Title) _____

(Job Title) _____

(Job Title) _____

Who is responsible for investigation and completion of your incident report forms? (Job Title) _____

Please provide your company's incident reporting procedures.

Please provide a copy of an investigation report conducted within the last year.

C. Does your company have an injury management procedure? Yes No
 Does it include a copy of the injury management procedure?

Does your injury management procedure include the use of occupational clinics (for non-critical injuries) as a preferred method of medical care? Yes No

E. Does your company have a nurse or doctor on staff? Yes No

F. Does your company use a third party to provide medical advice to injured employees? Yes No

If yes, which third-party company is used? _____

HEALTH AND SAFETY TRAINING

A. Do you have or provide company paid safety/health training to your employees? Yes No

Does your company have a formal safety orientation program for new employees? Does it include a safety evaluation?

Are records kept? Yes No

If yes, who conducts the orientation? (Job Title) _____



□ □ □ □ □ □ S □ □ □ □ □ □ E □ □ □ □ □ □ □ □ □ □

**S □ □ CONTRACTOR SAFET □ □
E □ A □ □ ATION FORM**

Attachment □ □ □ - □ NA

Issue □ Date: □ July □ □ □ □
Revision □ □ September □ □ □ □

If No, how are new employees informed of safety policies and procedures and expectations?

C. Do you have additional safety and health training for newly hired or promoted foremen/superintendents? Yes No

Topics Covered:

D. Do you maintain a record of all employees' training? Yes No

E. Are your employees enrolled in a Defensive Driving Training Program? Yes No

If Yes, describe the training, including the training provider, who receives the training, and course length.

Please provide a copy of training records from a recent HSE training course.

MEDICAL □ □ □ R □ □ TESTIN □ □

A. Does your company have a Drug Alcohol policy or program? Yes No

If Yes, does your drug and alcohol program include the following:

Pre-employment testing Yes No

Testing for Cause Yes No

Post-accident testing Yes No

Random testing Yes No

B. Does your company have an ongoing medical surveillance program as required by applicable governmental regulations? Yes No

Do you conduct medical examinations for:

Pre-employment Yes No



SAFETY EVALUATION FORM

Attachment 000-0 NA

SAFETY CONTRACTOR SAFETY EVALUATION FORM

Issue Date: July 2000
Revision: September 2000

Pre-placement Job Capability

Yes No

Hearing Function (Audiograms)

Yes No

Pulmonary

Yes No

Respiratory

Yes No

COMPLIANCE ASSURANCE

A. Does your company conduct job site safety inspections?

Yes No

How often?

Who conducts the inspection?

(Job Title)

Who receives the reports?

(Job Title)

Are inspections documented? (Yes/No/Not applicable)

Yes No

Comment on any other areas of your company's safety program and policies that you think will be appropriate in our evaluation.

Multiple horizontal lines for providing comments.



Subcontractor Safety Evaluation Form

Attachment 000-0 NA

Subcontractor Safety Evaluation Form

Issue Date: July 0000
Revision: September 0000

VERIFICATION OF DATA

Please have an officer of the Company sign below certifying that the information provided in this document is current and correct. Misrepresentation of data requested is grounds for immediate termination of contracts and disqualification from future consideration.

Name Title

Signature Date

REQUIRED INFORMATION SUBMITTALS

Please provide copies of the following documents with the completed evaluation form. Indicate the number of copies provided in the appropriate box.

- EMR documentation, or international equivalent, from your insurance carrier
U.S. only - OSHA 300 and OSHA Logs (Past 3 years) by employee names as requested
Description for any fatalities (if applicable)
Insurance Certificate(s) as applicable in U.S. as additional insured
Safety, Health, and Environmental Program (Table of Contents)
Stop Work, Short Service Employee, Fitness for Duty Policies/Procedures
Accident/Incident Reporting Procedure
Example of an Investigation Report conducted within the past year
Injury Management Procedure
Safety, Health & Environmental Orientation for New Hires (Outline)
Example of Safety, Health and Environmental Training Records
Example of Job Site Safety Inspection conducted within the past year

THIS PAGE IS TO BE COMPLETED BY URS CORPORATION.

Subcontractor Name

PASSENGER SAFETY MANAGEMENT EVALUATION

- Pass Subcontractor meets the criteria established in Attachment 000-0 NA, and no further action is required.
Fail Subcontractor does not meet the criteria established in Attachment 000-0 NA. If a unique business need exists, then a subcontractor variance must be initiated using Attachment 000-0 NA. The variance must be submitted to a Corporate, Regional, or Strategic Business Unit (SBU) HSE Manager for evaluation.

Project or Site Manager Name:

Signature:

Date:

**S CONTRACTOR
E A EVALUATION CRITERIA**

Prior to engaging a subcontractor on a project, Project Managers are required to ensure that the contractor has an effective safety program, is capable of conducting its operations in a safe manner, and has appropriate insurance coverage. The following criteria shall be followed in determining whether the subcontractor may be used on a URS Corporation project.

Note: Some questions/answers (Sections through) from Attachment NA are not discussed in the evaluation criteria below. These questions are asked and the answers are intended to help the Project Manager understand the safety culture and/or safety priority of the subcontractor.

ENERA INFORMATION

If subcontractor has performed work for URS previously, check safety performance history with previous URS Corporation Project Manager.

The numbers in this section directly correspond to the questions in Attachment NA.

WORKERS' COMPENSATION EXPERIENCE INFORMATION

- A. For any EMR, or international equivalent, listed as greater than , the contractor has failed the sub-evaluation. Further consideration may not occur without referral to a URS Regional, or Strategic Business Unit (SBU) Health, Safety, and Environment (HSE) Manager in your Region for further assessment.

If all EMRs listed are or below, continue with the evaluation.

SAFETY PERFORMANCE

- For any Total Recordable Incident Rate (line in table) listed as greater than , the subcontractor has failed the evaluation. Further considerations may not occur without referral to a URS Regional or SBU HSE Manager in your Region for further assessment.

If the Total Recordable Incident Rates are at or below , continue with the assessment.

- . If the contractor has had a fatality, further consideration may not occur without referral to a URS Regional or SBU HSE Manager in your Region.

- C. In the U.S., determine the subcontractor's citation history at <http://osha.gov/pls/imis/establishment.html>. Query Case Status Open and Closed. Compare the published data to the subcontractor questionnaire. The subcontractor must explain any discrepancies.

For international operations, consult a URS Regional or SBU Manager to evaluate citations/orders a subcontractor has disclosed.



Subcontractor Evaluation Criteria

Look for willful, serious, and repeat violations. If they suggest a problem, request information and refer to a URS Regional or S&U HSE Manager in your Region for further assessment.

RISK MANAGEMENT INSURANCE DATA

- 0.A. The ability to provide Insurance Certificates naming URS Corporation as an additional insured is required. Refer any questions to the URS Legal Department.
- 0.0 Proof of Workers' Compensation Insurance (or proof of exemption) is required. Refer any questions to the URS Legal Department.

HEALTH AND SAFETY PROGRAM

For Sections 0 through 0, if a subcontractor answers 'No' to any of the questions, the Project Manager needs to consider the type of work the subcontractor will be performing (e.g. HAZWOPER work required medical surveillance exams) to determine if the answer is acceptable.

- 0.A. A 'No' answer should be referred to a URS Regional or S&U HSE Manager in your Region for further assessment. For small subcontractors, a 'No' answer may be acceptable with good incident and insurance rate statistics. Generally, some minimal program is expected depending on the breadth and complexity of the work. Contact a URS Regional or S&U HSE Manager in your Region for further assessment if you have any questions or doubts.
- 0.0. It is expected that a subcontractor being hired to perform services on the project site should be the best prepared to address safety issues for their operations, especially when specialty work is being conducted, or for work in which the subcontractor possesses superior knowledge of their operations.

A 'No' answer should be referred to a URS Regional or S&U HSE Manager in your Region for further assessment.

Exceptions

If the subcontractor does not meet the other requirements outlined above, the decision will be that the subcontractor will not be used. However, if a unique business need exists (e.g., subcontractor is a specialty subcontractor), the Project Manager should initiate a Subcontractor Variance (Attachment 000-0 NA). The Subcontractor Variance must be approved by a Regional or S&U HSE Manager.



SE

SE CONTRACTOR VARIANCE FORM

Attachment 000-0 NA

Issue Date: July 0000
Revision 0 September 0000

Subcontractor Name: _____

Project or Site Location: _____

Description of Work to be Performed:

Explain any of the following conditions that apply to the subcontractor:

- EMR greater than 1.0
- TRIR greater than 1.0
- Fatalities within the past 5 years
- Willful, serious, or repeat OSHA citations

Why should we use this subcontractor?



SE

CONTRACTOR VARIANCE FORM

Attachment NA

Issue Date: July
Revision: September

Have other similar subcontractors been evaluated? If so, please explain.

Horizontal lines for text entry

Mitigations by URS to manage the risks.

Horizontal lines for text entry

R

P S M R

SE M A

Name: _____

Date: _____

Signature: _____

**URS SAFETY MANAGEMENT STANDARD 047
BIOLOGICAL HAZARDS**

- ii. **Rocky Mountain Spotted Fever** is an infection caused by the bacteria *Rickettsia rickettsii*. The disease occurs in North, Central, and South America. Other Rickettsia organisms cause disease worldwide (Mediterranean, Japan, Africa, North Asia). Symptoms which occur 3-7 days following a tick bite include: fever, nausea, vomiting, diarrhea, rash, muscle and joint pain. The disease is treated with antibiotics.
- iii. **Babesiosis** is caused by hemoprotozoan parasites of the genus *Babesia*. It is transmitted by the ixodid tick. The geographic distribution is worldwide. Symptoms include fever, chills, fatigue, muscle aches, and an enlarged spleen and liver. The disease is treated with anti-protozoan drugs.
- iv. **Lyme Disease** is caused by several bacteria of the genus *Borrelia*. The geographic distribution is global, primarily in temperate regions. Symptoms which occur 3-30 days following a tick bite include fever, headache, fatigue, muscle aches, nausea, vomiting, diarrhea, confusion, and occasionally a rash. The disease is treated with antibiotics.

b. Avoidance of tick habitats

Whenever possible, persons should avoid entering areas that are likely to be infested with ticks, particularly in spring and summer when nymphal ticks feed. Ticks favor a moist, shaded environment, especially which provided by leaf litter and low-lying vegetation in wooded, brushy, or overgrown grassy habitat. Both deer and rodent hosts must be abundant to maintain the life cycle of the tick.

c. Personal Protective Equipment

- i. Wear light colored clothing or white Tyvek to allow you to see ticks that are crawling on your clothing.
- ii. Tuck your pant legs into your socks or boots, wear high rubber boots, or use tape to close the opening where they meet so that ticks cannot crawl up the inside of your pant legs.
- iii. Wear a hat, and tie back long hair.
- iv. Apply repellents to discourage tick attachment. Repellents containing permethrin can be sprayed on boots and clothing, and will last for several days. Repellents containing DEET (n,n-diethyl-m-toluamide) can be applied to the skin, but will last only a few

hours before reapplication is necessary. Apply according to Environmental Protection Agency guidelines to reduce the possibility of toxicity.

d. Tick Check

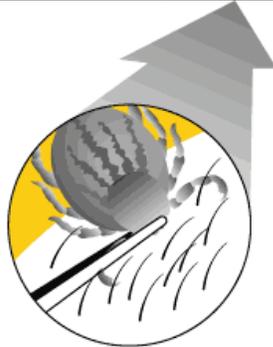
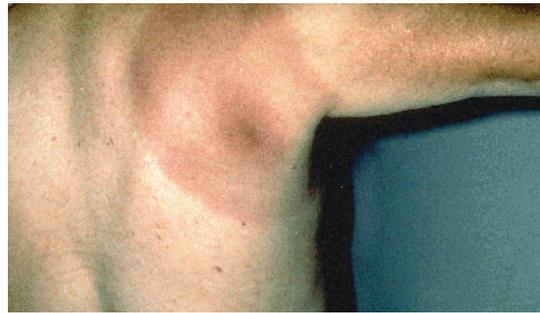
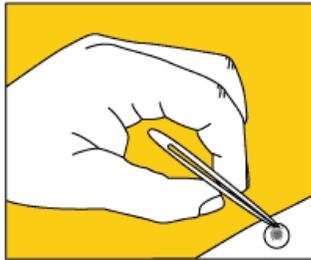
- i. Change clothes when you return from an area where ticks may be located.
- ii. Shower to wash off any loose ticks.
- iii. Check your entire body for ticks. Use a hand held or full-length mirror to view all parts of your body.
- iv. Place clothing worn in tick infested areas into the dryer for at least 00 minutes in order to kill any ticks.

0 Tick Removal

0ecause it takes several hours of attachment before microorganisms are transmitted from the tick to the host, prompt removal of attached or crawling ticks is an important method of preventing disease. Remember, folklore remedies of tick removal to do not work. Methods such as the use of petroleum jelly or hot matches may actually make matters worse by irritating the tick and stimulating it to release additional saliva or regurgitate gut contents, increasing the chances of transmitting disease.

The best method to remove an attached tick is with a set of fine tipped tweezers.





- a. Use fine-tipped tweezers. When possible, avoid removing ticks with bare hands.
- b. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with the tweezers.
- c. Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva and gut contents) may contain infectious organisms.
- d. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.
- e. Disinfect the tweezers.
- f. Save the tick for identification in case you become ill. This may help the doctor make an accurate diagnosis. Place the tick in a vial or plastic zip lock bag and put it in the freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

0. Medical Follow-Up

In most circumstances, medical treatment of persons who only have a tick bite is not recommended. However, individuals who are bitten by a tick should seek medical attention if any signs and symptoms of tick-borne disease develop over the weeks following the tick bite.

0. Poisonous Plants

0. Background Information

Poison ivy and poison oak plants are the most common cause of allergic contact dermatitis in North America. These poisonous plants can be a hazard for many various outdoor activities at work, home, and play. Skin contact with the oleoresins (urushiol) from these plants can cause an itchy, red, oozing, blistered rash in sensitive individuals. Oil content in the plants is highest in the spring and summer—however, the plants are even hazardous in the winter when they have dropped their leaves. There are three types of exposure:

- a. Direct contact: An initial skin exposure is necessary to sensitize the individual. Subsequent contact in a sensitized person will result in a rash appearing within 0 to 00 hours. Approximately 00 to 00 percent of the population is sensitized. Poison plant dermatitis is usually characterized by areas of linear or streaked patches where branches of the plant brushed the skin.
- b. Indirect contact: Skin exposure can happen indirectly. Clothing, shoes, tools, personal protective equipment, and other items can be contaminated with the oils and maintain potency for months.
- c. Airborne smoke contact: Never burn poison plants. Droplets of oil can be carried by smoke and enter the respiratory system, causing a severe internal outbreak.

Poison plant rash is not contagious. Skin contact with blister fluid from an affected individual will not cause dermatitis in another sensitized person. Scratching the rash can only spread it to other parts of your body if the oil is still on your skin. After the oil has been washed off or absorbed by the skin, scratching will not spread the rash.

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each and are green in the summer and red in the fall. Both plants also have greenish-white flowers and berries that grow in clusters. All parts of these plants are toxic.

Poison Ivy grows as a small plant, vine, and as a shrub. Leaves always consist of three glossy leaflets.



Poison Oak grows as a shrub or vine. It has three leaflets that resemble oak leaves.



Poison Sumac grows as a woody shrub or small tree from 6 to 12 feet tall. It has 7 to 13 leaves that grow opposite each other with a leaflet at the tip. Poison sumac grows in wet soils, typically in swamps and bogs.



Poison Sumac

- Precautionary Measures
 - a. The best approach is to learn to identify the plants and avoid them.
 - b. Wear long pants and long sleeves, boots, and gloves.
 - c. Barrier skin creams may offer some protection if applied before contact.

- d. Avoid indirect contact with tools, clothing, or other objects that have come into contact with a crushed or broken plant. Don't forget to wash contaminated clothing and clean up contaminated equipment.
- e. If you can wash exposed skin areas within 1 to 2 minutes with cold running water, you may keep the urushiol from penetrating your skin. Proper washing may not be practical in remote areas, but a small wash-up kit with pre-packaged alcohol-based cleansing tissues can be effective.

1. Medical Follow-Up

Home treatment: Calamine lotion and an oatmeal (1 cup to a tub full of water) bath can help relieve itching. To prevent secondary skin infection, scratching is not helpful, and the finger nails should be cut to avoid damage to the skin. Over-the-counter hydrocortisone cream can decrease inflammation and itching—however, read the label and use according to directions.

When to see the doctor: Severe cases may require further treatment. A physician should be seen if the rash appears infected, is on the face or other sensitive body areas, or is too extensive to be easily treated at home.

C. Mosquito-borne Diseases

1. Background Information

- a. Arboviral encephalitis is a viral illness causing inflammation of the brain, and is transmitted to humans by the bite of infected mosquitoes. Globally, there are several strains, including: Eastern equine, Japanese, La Crosse, St. Louis, West Nile, and Western equine encephalitis. Some of the strains have a vaccine. Symptoms of infection are nonspecific and flu-like: fever, headache, and tiredness. Fortunately, only a small proportion of infected people progress to encephalitis. Treatment is supportive, antibiotics are not effective.
- b. Malaria is a serious but preventable disease spread by the bite of an infected anopheline mosquito. It is caused by four species of the parasite *Plasmodium* (*Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malarium*, and *Plasmodium paluum*). Malaria-risk areas include primarily tropical areas of Central and South America, Africa, India, Southeast Asia, and the Middle East. Symptoms of malaria, which occur 10 days to 1 year after infection, include fever, shaking, chills, headache, muscle ache, tiredness,

Jaundice, nausea, vomiting, and diarrhea. Malaria can be cured with prescription drugs.

- c. Dengue Fever is a potentially life-threatening viral illness transmitted by the bite of the Aedes mosquito, found primarily in urban areas. The disease is found in most of tropical Asia, the Pacific Islands, Central and South America, and Africa. There are four dengue virus serotypes. Symptoms include sudden onset, high fever, severe headache, joint and muscle pain, rash, nausea, and vomiting. There is no specific treatment and no vaccine.
- d. Yellow Fever is a viral disease transmitted between humans by mosquitoes. It occurs only in Africa and South America. There is a vaccine that confers immunity lasting 10 years or more. Symptoms begin 3 to 6 days after the mosquito bite, and include fever, nausea, vomiting, headache, slow pulse, muscle aches, and restlessness. Treatment is symptomatic.
- e. West Nile virus is a viral disease transmitted by mosquitoes. It occurs in North America, Europe, Africa, west and central Asia, and the Middle East. There is no vaccine for West Nile virus. Symptoms include nausea, vomiting, and diarrhea.

4. Precautionary Measures

- a. Insect Repellent: Use insect repellants that contain DEET. The effect should last about 6 hours. Always use according to label directions. Use only when outdoors, and wash skin after coming indoors. Do not breathe in, swallow, or get into the eyes. Do not put on wounds or broken skin.
- b. Protective Clothing: Wear long-sleeved shirts and long pants, especially from dusk to dawn. Avoid going outdoors during these hours.
- c. Mosquito netting: Travelers who will not be staying in well-screened or air conditioned rooms should use a pyrethroid-containing flying insect spray in living and sleeping areas during evening and nighttime hours. Sleep under mosquito netting (bed nets) that has been sprayed with permethrin.
- d. Malaria prophylaxis medications may be prescribed; however, they do not provide complete protection. The type of medication given depends on the area of travel.

0. Poisonous Snakes

0. Background Information

No single characteristic distinguishes a poisonous snake from a harmless one except the presence of poison fangs and glands. Only in dead specimens can you determine the presence of these fangs and glands without danger. Most poisonous snakes have both neurotoxic and hemotoxic venom however, one type is dominant and the other is weak.

- a. Hemotoxic venom. The folded-fang snakes (fangs can raise to an erect position) have venoms that affect the circulatory system, destroying blood cells, damaging skin tissues, and causing internal hemorrhaging.
- b. Neurotoxic venom. The fixed-fang snakes (permanently erect fangs) have venoms that affect the nervous system, making the victim unable to breathe.
- c. Poisonous snakes in the Americas: copperhead, coral snake, cottonmouth, and rattlesnake.
- d. Poisonous snakes in Europe: adder, viper.
- e. Poisonous snakes in Africa and Asia: viper, cobra, adder, green mamba.
- f. Poisonous snakes in Australia: copperhead, adder, taipan, tiger snake.

0. Precautionary Measures

Bites occur when you don't hear or see the snake, when you step on them, or when you walk too close to them. Follow these simple rules to reduce the chance of accidental snakebite:

- a. Don't put your hands into dark places, such as rock crevices, heavy brush, or hollow logs, without first investigating.
- b. Don't step over a fallen tree. Step on the log and look to see if there is a snake resting on the other side.
- c. Don't walk through heavy brush or tall grass without looking down. Look where you are walking.
- d. Do not pick up any live snake. If you encounter a snake, walk around the snake, giving it plenty of room. A snake can strike half its length.

- e. Don't pick up freshly killed snakes without first severing the head. The nervous system may still be active and a dead snake can deliver a bite.

- q. Medical Follow-Up

If you are bitten by a snake, the primary goal is to get to a hospital as soon as possible to receive professional medical evaluation, and possible treatment with anti-venom if warranted. Initial first aid should include: Washing the bite with soap and water, immobilizing the bitten area and keeping it lower than the heart. Try to remain calm. If you are unable to reach a hospital within 30 minutes, a bandage, wrapped 1 to 2 inches above the bite, may help slow the venom. The bandage should not cut off blood flow from a vein or artery, make sure the bandage is loose enough that a finger can slip under it.

Research has shown the following to be potentially harmful: Do NOT apply ice, use a tourniquet, or make incisions into the wound.

E. Valley Fever

- q. Background Information

Valley Fever is an illness that results from exposure to a fungal spore (*Coccidioides immitis*). It is endemic to the San Joaquin Valley in California, as well as areas of the Southwestern U.S., Mexico, and Central and South America, although it has been found in many other areas. It is particularly associated with arid soils that are not cultivated. Exposure is generally by inhalation of spores, though it may also enter through broken skin. Approximately 2 weeks after inhalation exposure, severe weakness and flu-like symptoms develop, severe pneumonia may occur. It may also affect the brain, bones, and joints causing disability, spinal meningitis, or death. Dermal forms of the infection can form disfiguring fungal lesions.

- q. Precautionary Measures

Because it is associated with arid soils, personnel should avoid locations and activities that create dust. Persons at risk of exposure include geologists, surveyors, excavators, archaeologists, etc. Dust suppression methods should be employed and the use of particulate respirators should be considered for areas known to harbor the fungus. At one phase of the fungus' life cycle, cottony, spider-web-like growths may be seen on the soil surface. If observed, these growths must not be disturbed, and work should be relocated if possible.

0. Medical Follow-up

Approximately 00 percent of exposed persons will not have symptoms. Persons that have been in areas associated with Valley Fever should be alert to the development of flu-like symptoms, fatigue, or skin rashes 0 to 0 weeks later. Valley Fever can be treated with anti-fungal medication. Early treatment is critical, as disseminated forms of the disease can result in chronic disease or death.

F. Pathogenic organisms

0. Background Information

Employees who perform certain activities, such as disaster response, may be in areas where water-borne pathogens may be present. A partial list of agents includes: E. coli, Hepatitis A, typhoid, and cholera. Chemical hazards and molds and fungus may also be present. Refer to SMS 0000 Floodborne Pathogens for additional information.

0. Precautionary Measures

All work must be performed within the scope of either a Health and Safety Plan or Safe Work Plan that identifies the task hazards, and specifies appropriate controls. A medical exam and/or inoculations may be required. See SMS 000 Medical Screening and Surveillance, or contact the Occupational Health Manager for assistance.

Where contact with water or wet materials may occur, personnel must use protection such as impervious coveralls, boots/waders, faceshields, etc, as specified in the project Health and Safety Plan or Safe Work Plan. Personnel must protect any areas of broken skin, eyes, nose, and mouth from contact with potentially infectious materials, and practice good personal hygiene before eating, drinking, etc.

0. Medical Follow-up

Medical evaluation and/or an inoculation schedule may be required prior to beginning work. Because early evaluation and treatment is more successful, personnel should be alert to signs and symptoms of possible pathogenic organisms and seek prompt medical evaluation if illness develops or is suspected.

0. Natural disaster relief efforts

- 0. Natural disaster relief efforts present a variety of hazards, including biological hazards. Biological hazards potentially encountered during relief efforts include mold, sewage-contaminated water, various building materials that may puncture the skin and create various types of infections, and displaced animals and insects. Before work begins, each disaster relief site should be evaluated for the various types of biological hazards that may be encountered. Control measures must be developed to address the biological hazards.

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Complete and distribute a URS Incident Report form 000-0 for all work-related biological exposure incidents.

0. **R**00000000

- A. Centers for Disease Control <http://www.cdc.gov>
- 0. U. S. Occupational Safety and Health Administration <http://www.osha.gov>
- C. U.S. Food and Drug Administration - Treating and Preventing Venomous Snake Bites
<http://www.fda.gov/fdac/features/0000/snakes.html>
- 0. ENature 0 Identify plant and animals hazards in a specific area.
<http://enature.com/zipguides/index.asp?choice=poisonous>
- E. [SMS 000 0 Floodborne Pathogens](#)
- F. [SMS 000 0 Medical Screening and Surveillance](#)
- 0. [SMS 000 0 Injury Illness Incident Reporting 0 Notifications](#)
- H. [RC Pandemic Planning Guide](#)

URS SAFETY MANAGEMENT STANDARD 04
INJURY ILLNESS INCIDENT REPORTING & NOTIFICATIONS

URS SAFETY MANAGEMENT STANDARDS
Infrastructure Environment and
Federal Services

1. Accident Reporting

This standard applies to the operations of the Infrastructure Environment and Federal Services businesses of URS Corporation (URS) and its subsidiary companies.

Purpose and Scope

The purpose of this standard is to provide guidance for the timely reporting of work-related injuries, illness, and incidents. This procedure also defines incident notification procedures for URS employees. For incidents involving motor vehicles, the reporting and notification requirements of SMS 0001 Vehicle Safety Program may also apply.

For significant incidents (e.g., fatality, serious injury, injury to members of the public), SMS 0001 Incident Investigation is also required.

Note that this standard will also be used for investigation of critical injuries as defined by Canadian provincial regulations. See Supplemental Information A for definitions of critical injuries.

Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

Reporting

A. Reporting: All employees must immediately notify their appropriate level of management (line, project, and/or office) of a reportable incident. A reportable incident includes the following:

- An injury or illness to any URS employee or subcontractor, even if the injury does not require medical attention.
- An injury to a member of the public, or clients, occurring on a URS-controlled work site.
- Illness resulting from suspected chemical exposure.
- Chronic or re-occurring conditions such as back pain or cumulative trauma disorders (e.g., carpal tunnel syndrome).
- Fire, explosion, or flash.

URS SAFETY MANAGEMENT STANDARDS

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- Any vehicle accidents occurring on site, while traveling to or from client locations, or with any company-owned, rented, or leased vehicle (including personal vehicles used for company business). If the vehicle accident involves injury, complete both 000-0 NA and 000-0 NA. If the vehicle accident does not involve injuries, complete 000-0 NA.
- Property damage resulting from any URS or subcontractor activity.
- Structural collapse or potential structural hazards.
- Unexpected release or imminent release of a hazardous material.
- Unexpected chemical exposures to workers or the public.
- A safety-related complaint from the public regarding URS activities.
- Incidents that could result in adverse public media interest concerning URS or a URS project.
- Any incident that could or does result in an actual investigation by state, federal, provincial, or local regulatory or law enforcement agencies.
- Any other significant occurrence that could impact safety, including a near-miss.

Note: A near-miss is defined as an incident having the potential to cause significant injury or property damage as listed above, but did not. Examples of a near-miss include:

- a. A worker steps off a ledge, falls 0 feet (0 meter) to the floor, and is uninjured.
- b. A crane drops a 0,000-pound (000-kilogram) beam during a lift. Nobody is hurt, and no equipment is damaged.
- c. A work crew is conducting a survey along the highway. A vehicle leaves the roadway (driver asleep) and the vehicle enters the survey area at 00 miles per hour (00 kilometers per hour). The vehicle misses an employee by 0 feet (0 meter) the driver recovers control of the vehicle and leaves the area.

Actions: The following actions will be taken following a reportable incident:

Employees:

- a. If necessary, suspend operations and secure and/or evacuate the area.
 - b. Immediately notify your supervisor and/or project manager.
 - c. Contact appropriate emergency services and obtain appropriate medical attention, as required or directed by your supervisor. For additional information, refer to SMS 000 Injury and Claims Management.
 - d. Record information pertaining to the incident (e.g., time, date, location, name and company of person(s) involved, witnesses, description of event, and actions taken) and initiate Attachment 000-NA Incident Report Form for the appropriate business (i.e., Infrastructure Environment or Federal Services). (Note: The international operations of the Infrastructure Environment business will complete an on-line Incident Report instead, using the appropriate Health, Safety, and Environment (HSE) and Quality Improvement database. Federal Services will submit the report in 0-SMART.)
 - e. Infrastructure Environment employees shall submit 000-NA to the URS Occupational Health Manager (OHM) within 00 hours of the incident. Federal Services shall enter the incident into 0-SMART within 00 hours of the incident.
 - f. Assist with incident investigation as directed by management. Investigations shall be completed within 0 days of an incident.
 - g. Implement corrective actions as directed by management.
 - h. *Do not* discuss the incident with members of the news media or legal representatives (except URS legal counsel or your personal legal advisor) unless directed to do so by URS management.
 - i. *Do not* make statements pertaining to guilt, fault, or liability.
0. Line/Project Management Responsibilities (U.S. and Mexico Operations)
- a. For instances involving employee or subcontractor death or hospitalization, or equipment damage to Company or

customer equipment valued at more than \$100,000 (US\$), immediately notify by telephone or other direct means URS Operations and the HSE team in the order listed below. If any level of contact is unsuccessful, continue down the list in sequence. After notification has been made, a detailed follow-up, via email, is required.

- i. Appropriate corporate leadership for the affected program up to the Regional Business Unit (RBU) or Strategic Business Unit (SBU) Vice President for the affected operations.
- ii. The URS CHM.
- iii. Appropriate RBU and SBU HSE Manager for the affected operation.

Follow-up notification should be made by forwarding Attachment 000-0 NA to the CHM within 24 hours. See Attachment 000-0 NA for methods of distribution. Also, assure copies of the report are distributed as outlined on the form. For the international operations of the Infrastructure Environment business, this follow-up notification is not required.

Business Vice President/Director of HSE (or designee) will make notification to federal and state authorities as appropriate.

- b. For minor incidents involving only first aid treatment, minor damage to vehicle or equipment, etc., make notifications to a supervisor and CHM immediately and submit Attachment 000-0 NA. See Attachment 000-0 NA for methods of distribution. Also, assure copies of the report are distributed as outlined on the form.
- c. For a near-miss incident, complete an on-line near miss report, using the appropriate Health, Safety, and Environment (HSE) database. If needed, contact the Regional/SBU HSE Manager to determine which database is appropriate.
- d. Within 30 days of an incident, review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

e. Discuss with department or project staff the circumstances surrounding the incident and corrective actions taken.

4. Line Project Management Responsibilities (Canadian Operations)

a. If notified of an incident that is a critical injury (see Supplemental Information A for definition), serious accident, or other significant consequence:

- i. Immediately contact URS Canada Human Resources at (000) 000-0000.
- ii. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.
- iii. Follow up notification by completing, signing, and delivering faxing Attachment 000-0 NA to URS Canada Human Resources within 00 hours.
- iv. URS Canada Human Resources will make notification to provincial authorities as appropriate.

b. If notified of an incident that is not a critical injury, nor a serious accident or other significant consequence:

- i. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.
- ii. Complete, sign, and deliver fax Attachment 000-0 NA to URS Canada Human Resources within 00 hours.
- iii. URS Canada Human Resources will make notification to provincial authorities as appropriate.

c. If notified of a near-miss incident:

- i. Review circumstances (i.e., who, what, when, where, and how) of the incident with applicable employee(s) to determine apparent causes and to develop recommended corrective actions.

- ii. Complete an on-line near miss report, using the appropriate Health, Safety, and Environment (HSE) database. If needed, contact the Regional HSE Manager to determine which database is appropriate.
 - d. Discuss with department or project staff the circumstances surrounding the incident and corrective actions taken.
 - Local Office, Project, and/or Certified HSE Representative
 - a. Assist with incident evaluation.
 - b. With management, identify cause(s) of incident and identify corrective actions needed to avoid recurrence.
 - c. Review injury/incident report or the near-miss report for completeness and accuracy. Ensure the reports are distributed properly.
 - d. Ensure notifications are made in a timely manner.
 - e. Ensure that the injured employee is properly counseled/advised as directed by SMS 000 Injury and Claims Management. Communicate with the OSHM.
 - f. Note that Certified HSE Representatives are those who have received special training in occupational safety and health and have been certified by the Ontario Workplace Safety and Insurance Board. Certified HSE Representatives should be used at larger Canadian project sites where joint worker/employer safety committees are developed.
 - Occupational Health Manager
 - a. Report work-related injuries and illness to workers' compensation carrier.
 - b. Ensure that the employee's injury is managed in accordance with SMS 000 Injury and Claims Management. Provide guidance for the affected office, project, and/or Certified HSE Representative.
 - URS Human Resources (Canadian Operations Only)
 - a. Receive incident notifications from staff.

- b. For incidents involving critical injuries, serious accidents, or other significant consequences:
 - i. Verbally notify the Office Manager immediately, via cell phone if necessary.
 - ii. Notify the Certified HSE Representatives (management and worker) as soon as possible (where necessary).
 - iii. Notify the OSHM as soon as possible. Notification to the OSHM should in no case occur later than the end of the work shift.
 - iv. Follow up notification by receiving from staff and forwarding Attachment 000-0 NA to the OSHM within 00 hours. Also, assure copies of the report are distributed as outlined on the form.
- c. For minor incidents involving only first aid treatment, minor damage to vehicle or equipment, etc.:
 - i. Notify the OSHM as soon as reasonable during normal business hours.
 - ii. Receive from staff and forward Attachment 000-0 NA to the OSHM within 00 hours.

Ensure copies of the report are distributed as outlined on the form.
- d. Report work-related injuries and illness to the Workplace Safety and Insurance Board or appropriate workers' compensation carrier and other provincial or federal authorities as appropriate.
- e. Ensure, in conjunction with the Office HSE Representative, that the employee's injury is managed in accordance with SMS 000 Injury and Claims Management. Provide guidance for the affected Certified or Project HSE Representative.

Business HSE Management

URS SAFETY MANAGEMENT STANDARDS
INTERNATIONAL REGULATORY COMPLIANCE PROGRAM

- a. Notify URS management of any significant occurrence, including lost-time injuries, deaths, or other serious result or circumstance.
 - b. The CHM will review all reported incidents to determine OSHA reporting and recording requirements with input from the appropriate Business HSE Manager. For a determination of recordability in those infrequent instances where there is not a clear answer, the Business Vice President/Director HSE will make the final determination. All decisions will be based strictly on current U.S. Occupational Safety and Health Administration (OSHA) regulations.
 - c. Official records (including required reports and logs for all reported incidents) will be maintained at one central location by the CHM.
 - d. Where an incident has resulted in an injury or illness and that injury or illness is determined to be recordable in accordance with OSHA recordkeeping requirements, the CHM shall enter pertinent information related to the case into URS' recordkeeping documents no later than seven days after the event.
 - e. Each January, the CHM will prepare and distribute the appropriate government injury/illness reports to each URS establishment. These reports will summarize all required government information for incidents that occurred during the preceding calendar year. Reports, where required by regulation, will be signed by an officer of the company.
- If an incident occurs on a client-controlled site, Project Management will ensure that appropriate client notifications are made within the required time frames. These notification requirements will be documented in project-specific planning documents.
 - All notifications to external agencies (e.g., OSHA) will be made by the Business Vice President/Director HSE (or designee) in accordance with regulatory requirements.

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URS SAFETY MANAGEMENT STANDARDS

Infrastructure Environment Risk Management Network

File Attachment 000-0 NA in the appropriate safety files. Note that the international operations of the Infrastructure Environment business will use the appropriate HSE and Quality Improvement database.

R

A. Occupational Health Managers (OHMs)

Infrastructure Environment	Federal Services
S RN CONIS (000) 000-0000 (Toll Free-U.S.) (000) 000-0000 (Cell) (000) 000-0000 (Confidential Fax)	SN CONIS (000) 000-0000 (Toll Free) (000) 000-0000 (Cell) (000) 000-0000 (Confidential Fax)

B. [SMS 000](#) Vehicle Safety Program

C. [SMS 000](#) Injury and Claims Management

D. [SMS 000](#) Incident Investigation

E. [Attachment 000-0 NA IE](#) Infrastructure Environment Incident Report Form

F. [Attachment 000-0 NA FS](#) Federal Services Incident Report Form



Health, Safety and Environment
INFRASTRUCTURE & ENVIRONMENT
INCIDENT REPORT FORM

Attachment 049-1 NA IE

Issue Date: May 2001
Revision 10: January 2011

ADMINISTRATIVE INFORMATION

Database Office ID:

Group: East West International

Region:

Client Sector:

NOTIFICATION / LOCATION DATA

Site or Office:

Customer/Client Name:

Date of Event:

Time of Event:

Time Employee Started Work:

Date Supervisor

Time Supervisor

Name of Employee

Notified:

Notified:

Submitting Report:

Client Notification Completed (if required)? Yes No

Project/Order Number:

TYPE OF EVENT (Check all applicable items)

Illness (Check one)

- Employee
- Subcontractor
- Other

Injury (Check one)

- Employee
- Subcontractor
- Other

NAME of Injured/III Employee:

Property Damage (Check one)

- Company (owned, leased, rented)
- Client/Customer
- Other

Vehicular Accident (Check one)

- Company (owned, leased, rented)
- Client/Customer
- Other

Fire

Explosion

Flash

Other (describe):

EVENT SUMMARY

Briefly state the facts contributing to the event. Attach additional pages and supporting information, as necessary. Avoid use of employees' names. *If this is an injury or illness, supply additional information as required on Page 2.*

ROOT CAUSE DETERMINATION

Root Cause (State the root or primary cause, then select the most appropriate cause category from Page 4):

CONTRIBUTING FACTORS

Contributing Causes (Describe any contributing causes, then select the applicable cause categories from Page 4):

CORRECTIVE ACTIONS

List methods of preventing/avoiding this type of incident in the future. There must be one or more corrective actions for each root cause.



Health, Safety and Environment
INFRASTRUCTURE & ENVIRONMENT
INCIDENT REPORT FORM

Attachment 049-1 NA IE

Issue Date: May 2001
Revision 10: January 2011

FOR INJURIES/ILLNESS ONLY

Employee Information

What was the employee's location when the injury/illness occurred (include city and state)?

What was the employee doing when the injury/illness occurred? Describe the activity as well as the tools, equipment, or material you were using.

What happened? Describe how the injury/illness occurred.

What was the injury or illness? Describe the part of the body that was affected and how it was affected. Use the Incident Pick List on Page 4 to aid in your description.

What level of medical treatment was received? First Aid Clinic/Physician Emergency Room Refused/None

List witnesses and/or other employees involved. Attach statements where applicable.

Do you feel URS provided you with the proper safety instructions (including PPE usage) for the task you were performing at the time of the incident? Yes No (Explain below)

How do you think this type of incident could be prevented or avoided in the future?

Mark all PPE being used when the incident occurred:

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> Safety Glasses | <input type="checkbox"/> Safety Goggles | <input type="checkbox"/> Face Shield | <input type="checkbox"/> Safety Shoes |
| <input type="checkbox"/> Half-face Respirator | <input type="checkbox"/> Full-face Respirator | <input type="checkbox"/> Protective Gloves | <input type="checkbox"/> Chemical Gloves |
| <input type="checkbox"/> Hard Hat | <input type="checkbox"/> Hearing Protection | <input type="checkbox"/> Other (describe): | |

Injured/Ill Employee Signature: _____ Date: _____

Name of Injured/Ill Employee (Please print clearly): _____

Employee Number: _____ Contact Phone Number: _____

Additional Sheets Attached? Yes No (Include photos, maps, and/or diagrams when possible.)



Health, Safety and Environment
INFRASTRUCTURE & ENVIRONMENT
INCIDENT REPORT FORM

Attachment 049-1 NA IE

Issue Date: May 2001
Revision 10: January 2011

Supervisor Information

Describe any additional/different details other than those provided on the previous page. Avoid use of employees' names, where possible. Attach additional sheets, drawings, or photos, as needed.

Were the required tools available at the time of the injury? Yes No (Explain below)

At the time of the injury, was the employee using the correct tools for the task? Yes No (Explain below)

Was the employee sent for substance screening? Yes No (Explain below)

How do you think this type of incident could be prevented or avoided in the future?

Supervisor Signature: _____ Date: _____

Supervisor Name (Please print clearly): _____

Project Manager Comments

Signature: _____ Date: _____

Project Manager Name (Please print clearly): _____

HSE Representative Comments

Signature: _____ Date: _____

HSE Representative Name (Please print clearly): _____

Site/Office Manager Comments

Signature: _____ Date: _____

Site/Office Manager Name (Please print clearly): _____



Health, Safety and Environment
INFRASTRUCTURE & ENVIRONMENT
INCIDENT REPORT FORM

Attachment 049-1 NA IE

Issue Date: May 2001
Revision 10: January 2011

ROOT CAUSE CATEGORIES

Check all cause categories that apply to the incident, then choose the root cause (or causes) category from the boxes checked. Enter where indicated on Page 1.

PHYSICAL/ENVIRONMENT

- Extreme cold/ice
- Extreme heat
- Working/walking surface unfavorable
- Inadequate lighting
- Excessive noise
- Chemical exposure
- Biological hazards (animal/plant)
- Other weather
- Other

SYSTEMS

- Inadequate training/instruction
- Inadequate management system
- Missing or incorrect procedures or planning
- Inadequate management emphasis on safety
- Corporate/operations procedures not communicated
- Other

PHYSICAL/EQUIPMENT, TOOLS, and PPE

- Failure due to improper maintenance
- Failure due to improper design
- Other

HUMAN

- Failure to adequately recognize hazards
- Failure to follow procedures
- Failure to recognize condition change
- Impaired state (drug, alcohol, other)
- Physical/psychological limitation for task
- Inadequate communications (i.e., supervisor/employee)
- Carelessness by affected person(s)
- Carelessness by other person(s)
- Improper selection of equipment/tool/PPE
- Improper use of equipment/tool/PPE
- Other

INCIDENT PICK LIST

NATURE OF INJURY/ILLNESS

- Amputation
- Burn
- Concussion
- Contusion/Abrasion
- Corneal Abrasion
- Dental
- Dermatitis
- Fatality
- Fracture
- Hearing Loss
- Heat-Related Illness
- Hernia
- Insect Bite
- Laceration/Puncture
- Other
- Respiratory Disorder
- Sprain/Strain

BODY PART

- Ankle/Foot
- Arm/Elbow
- Back
- Eyes
- Head
- Hip/Groin
- Internal Organs/Blood
- Leg/Knee
- Multiple Body Parts
- Neck/Cervical
- Respiratory
- Shoulder
- Trunk
- Wrist/Hand

DIRECT CAUSE

- Animal/Insect Contact
- Biological Agent
- Caught Between
- Ergonomics/Repetitive Trauma
- Exposure To
- Miscellaneous
- Motor Vehicle Wreck
- Overexertion
- Poisonous Plant
- Slips/Trips/Falls
- Struck Against
- Struck By

DISTRIBUTION

NOTE: The preferred method of distribution of this report is by e-mail attachment either in Word, or scanned to PDF. Forward URS incident reports to the OHM at incidentreport@urscorp.com. Alternatively, reports may be faxed to 512.419.6413. Initial reports must be submitted to the OHM within 24 hours of incident. More detailed follow-up reports may be submitted later.

Additional Distribution: Program/Client Sector Manager Regional HSE Manager Office HSE Representative

Per the Ontario Occupational Health and Safety Act, R.R.O. 1990, Regulation 834, a Critical Injury is defined as an injury of a serious nature that:

- a. Places life in jeopardy;
- b. Produces unconsciousness;
- c. Results in substantial loss of blood;
- d. Involves the fracture of a leg or arm but not a finger or toe;
- e. Involves the amputation of a leg, arm, hand or foot, but not a finger or toe;
- f. Consists of burns to a major portion of the body; or
- g. Causes the loss of sight in an eye.

Per the British Columbia Workers Compensation Act, RSBC 1996, Chapter 492, a Critical Injury is defined as injury of a serious nature that includes the following:

- a. Any incident that kills, causes risk of death, or seriously injures a worker;
- b. Any blasting accident that results in injury, or unusual event involving explosives;
- c. A diving incident that causes death, injury, or decompression sickness requiring treatment;
- d. A major leak or release of a dangerous substance;
- e. A major structural failure or collapse of a structure, equipment, construction support system or excavation; and any serious mishap.

**URS SAFETY MANAGEMENT STANDARD 055
HEALTH, SAFETY AND ENVIRONMENT TRAINING**

URS SAFETY MANAGEMENT STANDARD

Health, Safety, and Environment Training

1. Applicability

This standard applies to the operations of URS Corporation and its subsidiary companies. These are the minimum Health, Safety, and Environment (HSE) compliance training requirements and tracking procedures. Specific geographic entities, business units, and projects may require additional training. These requirements may be dictated by federal/national, state/provincial, or local agencies or by the activities of a specific work group or project team.

2. Purpose and Scope

This standard was developed to assist employees and managers in the identification of training requirements and to define the URS procedures for tracking/documenting this training. It covers environmental, hazardous materials, and health and safety training only. The goals of this standard are to ensure regulatory compliance and to provide employees with the information/training they need to accomplish their work assignments safely; prevent injuries to themselves, coworkers, surrounding communities, and customers; and protect company and/or customer property and the environment.

3. Implementation

- A. The assigned Site/Office Manager is responsible for ensuring compliance with this standard and any additional requirements necessary because of the physical location of the facility and/or the business units in operation at that facility (e.g., laboratories).
- B. The Program/Project Manager is responsible for ensuring project or program-related compliance (e.g., compliance of project/program staff members) with this standard and any additional training necessary because of specific project/program activities.
- C. The HSE Training Coordinator (HTC) is responsible for maintaining a training calendar, filing original records/tests, issuing certificates for business-sponsored training, maintaining and issuing training materials, adding approved courses and course information to the training database, and updating the URS HSE intranet site with course information.

4. Requirements

- A. Employee training requirements are dictated by the work each employee performs (or is expected to perform) and the geographic area(s) where the

URS SAFETY MANAGEMENT STANDARD
Health, Safety, and Environment Training

- employee performs these activities. In most cases, there is a regulatory driver for specific training.
- B. All new URS employees must be provided an orientation on the URS HSE Program. Details on orientation requirements are provided in SMS 025 – New Employee Health, Safety and Environment Orientation and SMS 078 – Short Service Employee.
 - C. HSE Training Evaluation – Attachment 055-1 NA is a list of the most common courses that may be required, their frequency, and expected participants. This table will be updated as regulatory and company requirements change. These requirements may be necessary due to the individual’s project, site, or office activities, or the location of the facility. The responses to this simple questionnaire dictate what training an individual needs in addition to the basic URS courses. Once these requirements have been identified, each employee is expected to complete the required training as soon as possible and to track his/her progress.
 - D. Training requirements should be re-evaluated at least annually and more frequently if an employee’s assigned duties change significantly.
 - E. To ensure consistency in content and duration and in meeting regulatory and company requirements, URS training materials should be used as the basis for training whenever they are available. Trainers may always elect to supplement the base training materials for these courses with specifics for the program, project, customer, office, or geographic unit.
 - F. For training requiring certification (regulatory or URS-driven), trainers must be Business, Country, Group, Regional Business Unit (RBU), or Strategic Business Unit (SBU) HSE Managers or approved by the Business, Country, Group, RBU, or SBU HSE Manager.
 - G. Training is offered in a variety of formats, including classroom instruction, computer based training (CBT), and on-the-job (OTJ) training. To ensure that training is consistent and that all requirements are being met, external courses (e.g., 40-Hour HAZOPWER), including classroom instruction and CBT, should be evaluated and approved by the Business, Country, Group, RBU, or SBU HSE Manager. Local HSE staff will be able to assist in identifying qualified external vendors as necessary.
 - H. URS staff is expected to be familiar with applicable training requirements. Staff members are expected to track their own progress toward meeting those requirements.

URS SAFETY MANAGEMENT STANDARD
Health, Safety, and Environment Training

- I. Supervisors and office/location managers are expected to be familiar with the training requirements of staff that report to them.
- J. A sample safety training flow chart is available in Supplemental Information A.

5. Documentation Summary

- A. Those courses so denoted in Attachment 055-1 NA or Commonly Required Training will be tracked in a training database.
- B. All training must be documented using a training Attendance Record – Attachment 055-2 NA and Course Agenda. This attendance form requires participants to acknowledge by their signature that they received the training.
- C. Minimum course agenda requirements are as follows:
 - Type of course.
 - Course date.
 - Course location.
 - Topics covered.
 - Length of time covered for each topic.
 - Course duration (start/end times).
 - Instructor(s) name.
- D. For training provided by customers/vendors, training documentation must include the following:
 - Copy of the attendee's course certificate.
 - Course agenda.

In some cases, objective evidence of comprehension is required. This information must be tracked in addition to the course certificate and agenda.

- E. Group, RBU, and SBU HSE Managers will ensure that the course agenda meets regulatory/company requirements. Attendance records will be entered into the HSE training database.

URS SAFETY MANAGEMENT STANDARD
Health, Safety, and Environment Training

- F. For corporately tracked courses, original attendance sheets, agendas, course evaluations, and any completed tests will be sent to the HTC. These should be filed by course then by date for easy access/auditing.
- G. Locations/projects/programs will maintain records on any project, program, or location- or site-specific training requirements such as fire extinguisher training, project health and safety plan training, and chemical hygiene program (laboratory safety) training. HSE Representatives will also maintain copies of attendance records for courses being tracked corporately.
- H. For courses requiring Business certification, the Vice President of HSE (or designee) or customer/vendor will issue certificates. A copy of the certificate must be provided to the HTC, along with course content information and sign-in sheets (see Item 5.D). For Federal Services employees, a copy of the certificate is to be provided to the appropriate Human Resources Manager for inclusion into the personnel record (Human Resources Management System or HRMS).

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA), [Training Requirements in OSHA Standards and Training Guidelines](#)
- B. [SMS 025](#) – New Employee Health, Safety and Environment Orientation
- C. [SMS 078](#) – Short Service Employee
- D. [Attachment 055-1 NA](#) – HSE Training Evaluation
- E. [Attachment 055-2 NA](#) – Attendance Record



Health, Safety and Environment
HSE TRAINING EVALUATION

Attachment 055-1 NA

Issue Date: November 2000
Revision 9: September 2011

Name _____ Location _____ Date _____

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required <input checked="" type="checkbox"/>	Comments
Asbestos Inspector	Y	Annual	You perform asbestos sampling tasks.	<input type="checkbox"/>	
Asbestos Planner	Y	Annual	You serve as the project asbestos planner.	<input type="checkbox"/>	
Automated External Defibrillator (AED)	Y	As established by the training provider	You are designated to be an AED user in a URS office or project site.	<input type="checkbox"/>	
Behavior Based Safety	N	Annual	Required for all Infrastructure & Environment employees.	<input type="checkbox"/>	Concepts of behavior based safety, including the observation process (how to do one, who does one, the purpose). Available online through the URS Learning Management System (LMS).
Bloodborne Pathogens	Y	Annual	Required for employees designated as a first aid responder or others who have a potential bloodborne pathogen exposure.	<input type="checkbox"/>	
Cardiac Pulmonary Resuscitation (CPR)	Y	As established by the training provider	Required for 1) employees who are designated as first aid responders, 2) employees who are performing high hazard activities (e.g., potential for falls, suffocation, electrocution, amputation) and medical attention is more than 4 minutes away, or 3) required by client contract.	<input type="checkbox"/>	Acquire training from recognized source (e.g., Red Cross, American Heart).
Confined Space Entry	Y	Once	You perform confined space entry/authorizer/attendant duties (including anyone performing non-entry rescue activities).	<input type="checkbox"/>	
Confined Space Refresher	N	As needed	Recommended if you perform entry activities.	<input type="checkbox"/>	
Confined Space Rescuer	Y	Once	You may have to enter a confined space to perform a rescue.	<input type="checkbox"/>	
Confined Space Entry Awareness	N	As needed	You work with and around confined spaces that may require entry; however, you are not responsible for performing entry/authorizer/attendant duties.	<input type="checkbox"/>	30-minute CSE Awareness module offered online through URS LMS.
Construction Safety (10-hour OSHA Outreach Training)	N	Once	Recommended if you are a Supervisor and/or Safety Officer at Construction Sites	<input type="checkbox"/>	
Construction Safety (30-hour OSHA Outreach Training)	N	Once	Required if you serve as a site safety and health officer on US Army Corps of Engineers (USACE) projects, or other DoD projects which follow the provisions of EM 385-1-1 (USACE Safety and Health Requirements Manual)	<input type="checkbox"/>	



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Attachment 055-1 NA

Issue Date: November 2000
Revision 9: September 2011

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required <input checked="" type="checkbox"/>	Comments
Emergency Preparedness Plan	Y	Once	Required for all URS employees.	<input type="checkbox"/>	For office personnel, this information is covered in employee orientation. For field/site personnel, this is covered in project/site safety training.
Ergonomics	N	Once	Recommended for staff who are primarily office employees.	<input type="checkbox"/>	Available online through the URS LMS.
Excavations/Trenching Awareness	Y	Once	You work at sites where excavation/trenching tasks are performed.	<input type="checkbox"/>	Available online through URS LMS.
Excavations/Trenching Competent Person	Y	Once	You are or may be designated as a competent person (educational background and experience may allow for grandfathering).	<input type="checkbox"/>	
Experienced Miner Training	Y	Once, followed by annual refreshers	You meet the US Mine Safety and Health Administration (MSHA) definition of an "Experienced Miner."	<input type="checkbox"/>	See Surface Miner and Underground Miner training for information on annual refreshers.
Fall Prevention/Protection	Y	Once	You supervise tasks or perform tasks at heights (on roofs, scaffolding, ladders, unfinished flooring).	<input type="checkbox"/>	
Field Safety Training (4 hours)	N	Biennial	Required for all Infrastructure & Environment (IE) non-craft employees performing field work who are not in the hazardous waste training program. This training is also required for any IE Project Manager that manage projects where field work is performed.	<input type="checkbox"/>	Specific content will depend on the office and the employees' expected work. When offered as a combination of online modules and classroom instruction, online modules must be completed prior to the classroom portion for participants to receive credit. Both portions (online and classroom) need to be completed within the same calendar year.
Fire Extinguisher	Y	Annual	You may be expected to use fire extinguishers (fixed facilities and project sites).	<input type="checkbox"/>	
First Aid	Y	As established by the training provider	Required for 1) employees who are designated as first aid responders, 2) employees who are performing high hazard activities (e.g., potential for falls, suffocation, electrocution, amputation) and medical attention is more than 4 minutes away, or 3) required by client contract.	<input type="checkbox"/>	Acquire training from recognized source (e.g., Red Cross, American Heart).



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Attachment 055-1 NA

Issue Date: November 2000
Revision 9: September 2011

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required <input checked="" type="checkbox"/>	Comments
H&S Issues for Project Managers	N	Once	Required if you manage projects involving field work.	<input type="checkbox"/>	Offered as part of PM Training. Online courses available through URS LMS include Handling Specific Health and Safety Issues, Planning for Health and Safety, and Project Delivery Aspects of Health and Safety.
Hazard Communication	Y	Initially and if hazards change	Required for anyone who is potentially exposed to/works with hazardous chemicals.	<input type="checkbox"/>	Training must occur before any work with hazardous chemicals. Included (as needed) in HSE Orientation. After the initial training, required updates will typically be handled as part of project-specific HSE training. Refresher training is also available online through the URS LMS.
Hazardous Materials Shipping	Y	Biennial	Required for anyone who packages, labels, transports, completes paperwork for, or offers for shipment, hazardous materials/dangerous goods.	<input type="checkbox"/>	Initial training is approximately 16 hours. 30-minute Hazmat Shipping Awareness class is available online through the URS LMS.
Hazardous Waste Operations (40-hours – U.S.) (24-hours – non U.S.)	Y	Once	Anyone performing work or expected to perform at hazardous waste sites or treatment, storage, and disposal facilities.	<input type="checkbox"/>	See SMS 017. Training must have a 'hands-on' component (i.e., donning/doffing PPE). Any exceptions must be approved by a Regional HSE Manager/Group HSE Director.
Hazardous Waste Operations – Refresher (8 hours)	Y	Annual	(See Hazardous Waste Operations.)	<input type="checkbox"/>	When offered as a combination of online modules and classroom instruction, online modules must be completed prior to the classroom portion for participants to receive credit. Both portions (online and classroom) need to be completed within the same calendar year.
Hazardous Waste Operations – Supervisor (8 hours)	Y	Once	Required for anyone serving as the site supervisor at a hazardous waste site.	<input type="checkbox"/>	When offered as a combination of online modules and classroom instruction, online modules must be completed prior to the classroom portion for participants to receive credit. Both portions (online and classroom) need to be completed within the same calendar year.



**Health, Safety and Environment
HSE TRAINING EVALUATION**

Attachment 055-1 NA

Issue Date: November 2000
Revision 9: September 2011

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required <input checked="" type="checkbox"/>	Comments
Health, Safety, and Environment (HSE) Orientation	Y	Once	Required for all URS employees.	<input type="checkbox"/>	Specific content will depend on the office and the employees' expected work. See SMS 025.
Hearing Conservation	Y	Annual	Employees exposed to noise at or above 85 decibels averaged over an 8-hour day.	<input type="checkbox"/>	Available online through URS LMS.
HSE Representative Training	N	Once; follow-up as needed	Required for anyone assigned to the role of URS HSE Representative.	<input type="checkbox"/>	URS company metrics, training programs, and technical topics to support the HSE Representative position. HSE training for non-HAZWOPER trained personnel, describing OSHA and EPA regulatory requirements.
Injury/Illness Prevention	Y	Once	You are assigned to California offices.	<input type="checkbox"/>	Covered in California office HSE Orientation.
Laboratory Safety	Y	Once	You work in a fixed or mobile wet chemistry lab.	<input type="checkbox"/>	Completed as part of site or project orientation.
Lead Project Designer	Y	Every 3 years	You are a lead project designer.	<input type="checkbox"/>	
Lead Risk Assessor	Y	Every 3 years	You are a project lead risk assessor inspector.	<input type="checkbox"/>	
Lockout/Tagout Awareness – Affected Person	Y	Once; follow-up as required by regulations	You work with and around equipment that may need to be locked out/tagged out. (You are not responsible for applying tags/locks).	<input type="checkbox"/>	Available online through the URS LMS.
Lockout/Tagout – Authorized Person	Y	Once; follow-up as required by regulations	You lock out or tag out machines or equipment in order to perform servicing or maintenance on that machine or equipment.	<input type="checkbox"/>	Specific to individual machines.
Marine Trash and Debris Awareness and Limitation	Y	Annual	You work on contract operations for lessees and/or operators of oil and gas operations in the Gulf of Mexico.	<input type="checkbox"/>	Provided by lessee or operator.
Nuclear Density Gauge Operator	Y	Once	You <u>operate</u> nuclear density gauges.	<input type="checkbox"/>	Troxler or equivalent training.
Nuclear Density Gauge Transporter	Y	Every 3 years	You <u>transport</u> nuclear density gauges.	<input type="checkbox"/>	Hazardous Materials shipping.
Powered Industrial Trucks (Forklifts)	Y	Once	Your job assignments include operating a powered industrial truck (forklift).	<input type="checkbox"/>	Required more frequently if assessments indicate the need.
Radiation Safety Officer	Y	Once	You are designated as a Radiation Safety Officer.	<input type="checkbox"/>	
Respiratory Protection	Y	Annual	Required for any employee who may be required to wear a respirator.	<input type="checkbox"/>	Initial training is approximately 1 hour. Annual refresher training is approximately 0.5 hour. Annual refresher training is available online through the URS LMS.
Self Contained Breathing Apparatus (SCBA)/Cascade Systems	Y	Once	Required for any employee required to wear SCBAs or to operate a supplied air system.	<input type="checkbox"/>	Part of Project HSE training as needed.



Health, Safety and Environment
HSE TRAINING EVALUATION

Attachment 055-1 NA

Issue Date: November 2000
Revision 9: September 2011

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required <input checked="" type="checkbox"/>	Comments
Shipping Specialist	Y	Once	You are designated as a Shipping Specialist and/or are a Regional/SBU HSE Manager.	<input type="checkbox"/>	Updates are required as regulations change.
Site Safety Training (4 hours)	N	Biennial	Required primarily for Federal Services employees performing tasks at fixed locations (e.g., warehouses, laboratories, vehicle maintenance, aircraft maintenance).	<input type="checkbox"/>	Specific content will depend on the site and the employees' expected work.
Site Supervisor Training	N	Once	Required for all Federal Services Supervisors who are responsible for a site.	<input type="checkbox"/>	
Substance Specific	Y	Once	Any employee potentially exposed to a substance covered by the 29 CFR substance specific regulations. See SMS 050.	<input type="checkbox"/>	Includes lead, asbestos, benzene, etc. Offered as part of project-specific training.
Surface Miner Training – New (24 hours)	Y	Once	You perform work at surface mine sites regulated by MSHA.	<input type="checkbox"/>	Training is conducted by MSHA-approved instructors under MSHA-approved training plan.
Surface Miner Training – Annual Refresher (8 hours)	Y	Annual	You perform work at surface mine sites regulated by MSHA.	<input type="checkbox"/>	Training is conducted by MSHA-approved instructors under MSHA-approved training plan.
Underground Miner Training – New (40 hours)	Y	Once	You perform work in underground mine sites regulated by MSHA.	<input type="checkbox"/>	Training is conducted by MSHA-approved instructors under MSHA-approved training plan.
Underground Miner Training – Annual Refresher (8 hours)	Y	Annual	You perform work in underground mine sites regulated by MSHA.	<input type="checkbox"/>	Training is conducted by MSHA-approved instructors under MSHA-approved training plan.
Vehicle Safety	N	Once	Required for employees who drive on company business.	<input type="checkbox"/>	Authorized Drivers are those individuals permitted to drive URS-owned, -leased, or -rented vehicles, and employees who drive a personal vehicle for work purposes and are reimbursed for mileage. See SMS 057.
Waste Awareness	Y	Annual	You generate, handle, or manage hazardous waste at a fixed facility or field project.	<input type="checkbox"/>	Available online through the URS LMS.
Waste Specialist	Y	Once with Annual Refresher	You are responsible for waste management at a small or large quantity generator facility.	<input type="checkbox"/>	
Welding/Brazing/Cutting	Y		You job duties include these activities.	<input type="checkbox"/>	
Workplace Hazardous Materials Information System (WHMIS)	Y	Annual	You are assigned to a Canadian facility and work with or around hazardous materials.	<input type="checkbox"/>	Canadian Hazard Communications.

This supplement defines and lists the areas within the OSHA Construction Standards where a competent person is required to be part of a particular project activity

A. Definition

A **competent person** is “one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them (Subpart C; 29 CFR 1926.32(f)).”

B. Accident Prevention

“(Accident prevention) programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by **competent persons** designated by the employers (Subpart C: 29 CFR 1926.20(b)(2)).”

C. Ionizing Radiation

“Any activity which involves the use of radioactive materials or X-rays, whether or not under license from the Nuclear Regulatory Commission, shall be performed by **competent persons** specially trained in the proper and safe operation of such equipment. In the case of materials used under Commission license, only persons actually licensed, or **competent persons** under direction and supervision of the licensee, shall perform such work (Subpart D; 29 CFR 1926.53(b)).”

D. Respiratory Protection

“Administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and technical measures used for this purpose must first be approved for each particular use by a **competent** industrial hygienist or other technically qualified person (Subpart D; 29 CFR 1926.55(b)).”

E. Lead

“The compliance program shall provide for frequent and regular inspections of job sites, materials, and equipment to be made by a **competent person** (Subpart D; 29 CFR 1926.62(e)(2)(iii)).”

F. Hearing Protection

“Ear protective devices inserted in the ear shall be fitted or determined individually by **competent persons** (Subpart E; 29 CFR 1926.101(b)).”

G. Material Handling

“Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a **competent person** designated by the employer (Subpart H; 29 CFR 1926.251(a)(6)).”

H. Welding, Cutting, and Heating

“Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a **competent person** to determine its flammability (Subpart J; 29 CFR 1926.354(a)).”

I. Assured Equipment Grounding Conductor Program

“The employer shall designate one or more **competent persons** to implement the program (Subpart K; 29 CFR 1926.404(b)(1)(iii)(B)).”

J. Scaffolding

1. “Before the scaffold is used, direct connections shall be evaluated by a **competent person** who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, an engineer experienced in such scaffold design shall design masons’ multi-point adjustable suspension scaffold connections (Subpart L; 29 CFR 1926.451(d)(3)(i)).” Note that this passage applies to suspension scaffolds only.
2. “The employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a **competent person** to recognize any hazards associated with the work in question (Subpart L; 29 CFR 1926.454(b)).” Per the standard, the training should include the following topics, as applicable:
 - a. The nature of scaffold hazards;
 - b. The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question;

- c. The design criteria, maximum intended load-carrying capacity and intended use of the scaffold; and
- d. Any other pertinent requirements of 1926 Subpart L.

K. Fall Protection

1. “Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a **competent person** to be undamaged and suitable for reuse (Subpart M; 29 CFR 1926.502(d)(19)).”
2. Where safety monitoring systems are employed, “the employer shall designate a **competent person** to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements (Subpart M: 29 CFR 1926.502(h)(1)):
 - a. The safety monitor shall be competent to recognize fall hazards;
 - b. The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;
 - c. The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee being monitored;
 - d. The safety monitor shall be close enough to communicate orally with the employee; and
 - e. The safety monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function.”
3. “The implementation of the fall protection plan shall be under the supervision of a **competent person** (Subpart M; 29 CFR 1926.502(k)(4).” This section specifically refers to the implementation of fall protection plans on projects where it is infeasible or it creates a greater hazard to use conventional fall protection equipment.
4. “The employer shall assure that a **competent person** qualified in the following areas has trained each employee, as necessary (Subpart M; 29 CFR 1926.503(a)(2))”:

- a. The nature of fall hazards in the work area;
- b. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
- c. The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
- d. The role of each employee in the safety monitoring system when this system is used;
- e. The limitations on the use of mechanical equipment during the performance of elevated work;
- f. The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection;
- g. The role of employees in fall protection plans, and
- h. The standards contained in 1926 Subpart M.

L. Cranes and Derricks

1. "The employer shall designate a **competent person** who shall inspect all machinery and equipment prior to each use, and during use, to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use (Subpart N; 29 CFR 1926.550(a)(5))."
2. "A thorough annual inspection of the hoisting machinery shall be made by a **competent person**, or by a government or private agency recognized by the U.S. Department of Labor. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment (Subpart N; 29 CFR 1926.550(a)(6))."
3. "The personnel platform and suspension system shall be designed by a qualified engineer or a **qualified person competent** in structural design (Subpart N; 29 CFR 1926.550(g)(4)(i)(A))."
4. "A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by

a **competent person** immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure (Subpart N; 29 CFR 1926.550(g)(5)(iv)).”

5. “At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform’s rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a **competent person** shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied (Subpart N; 29 CFR 1926.550(g)(5)(vi)).”

M. Material Hoists, Personnel Hoists and Elevators

“Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a **competent person**. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than 3-month intervals. The employer shall prepare a certification record which includes the date the inspection and test of all functions and safety devices was performed; the signature of the person who performed the inspection and test; and a serial number, or other identifier, for the hoist that was inspected and tested. The most recent certification record shall be maintained on file (Subpart N; 29 CFR 1926.552(c)(15)).”

N. Excavations

1. “Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a **competent person**. Structural ramps used for access or egress of equipment shall be designed by a **competent person** qualified in structural design, and shall be constructed in accordance with the design (Subpart P; 29 CFR 1926.651(c)(1)(i)).”
2. “If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a **competent person** to ensure proper operation (Subpart P; 29 CFR 1926.651(h)(2)).”

3. "If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a **competent person** and compliance with paragraphs (h)(1) and (h)(2) of 1926.651 (Subpart P; 29 CFR 1926.651(h)(3))."
4. "Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a **competent person** for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the **competent person** prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated (Subpart P; 29 CFR 1926.651(k)(1))."
5. "Where the **competent person** finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety (Subpart P; 29 CFR 1926.651(k)(2))."
6. Employees shall be protected from cave-ins except where "excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a **competent person** provides no indication of a potential cave-in (Subpart P; 29 CFR 1926.652(a)(1)(ii))."
7. "When material or equipment that is used for protective systems is damaged, a **competent person** shall examine the material or equipment and evaluate its suitability for continued use. If the **competent person** cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service (Subpart P; 29 CFR 1926.652(d)(3))."
8. "Each soil and rock deposit shall be classified by a **competent person** as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix (1926 Subpart P, Appendix A, (a)(2)(C)(1))."

9. "The classification of the deposits shall be made based on the result of at least one visual and at least one manual analysis. Such analyses shall be conducted by a **competent person** using tests described in paragraph (d) of this appendix, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system (1926 Subpart P, Appendix A, (a)(2)(C)(2))."
10. "If after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a **competent person**. The deposit shall be reclassified as necessary to reflect the changed circumstances (1926 Subpart P, Appendix A, (a)(2)(C)(5))."
11. "When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a **competent person** shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved (1926 Subpart P, Appendix B, (c)(3)(iii))."

O. Lift-Slab Operations

"If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a **competent person** while lifting is in progress. In addition to meeting the definition in 1926.32(f), the **competent person** must be experienced in the lifting operation and with the lifting equipment being used (Subpart Q, 29 CFR 1926.705(i))."

P. Steel Erection - Cranes

1. "Cranes being used in steel erection activities shall be visually inspected prior to each shift by a **competent person**; the inspection shall include observation for deficiencies during operation. At a minimum this inspection shall include the following (Subpart R: 29 CFR 1926.753(c)(1)(i)):
 - a. All control mechanisms for maladjustments;
 - b. Control and drive mechanism for excessive wear of components and contamination by lubricants, water or other foreign matter;
 - c. Safety devices, including but not limited to boom angle indicators, boom stops, boom kick out devices, anti-two block devices, and load moment indicators where required;

- d. Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation;
 - e. Hooks and latches for deformation, chemical damage, cracks, or wear;
 - f. Wire rope reeving for compliance with hoisting equipment manufacturer's specifications;
 - g. Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, or moisture accumulation;
 - h. Hydraulic system for proper fluid level;
 - i. Tires for proper inflation and condition;
 - j. Ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions;
 - k. The hoisting equipment for level position; and
 - l. The hoisting equipment for level position after each move and setup."
2. "If any deficiency is identified, an immediate determination shall be made by the **competent person** as to whether the deficiency constitutes a hazard (Subpart R; 29 CFR 1926.753(c)(1)(ii))."

Q. Steel Erection – Structural Steel Assembly

- 1. "When deemed necessary by a **competent person**, plumbing-up equipment shall be installed in conjunction with the steel erection process to ensure the stability of the structure (Subpart R; 29 CFR 1926.754(d)(1))."
- 2. "Plumbing-up equipment shall be removed only with the approval of a **competent person** (Subpart R; 29 CFR 1926.754(d)(3))."

R. Steel Erection – Column Anchorage

"All columns shall be evaluated by a **competent person** to determine whether guying or bracing is needed; if guying or bracing is needed, it shall be installed (Subpart R; 29 CFR 1926.755(a)(4))."

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S. Steel Erection – Beams and Columns

“A **competent person** shall determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they shall be installed (Subpart R; 29 CFR 1926.756(a)(2)).”

T. Underground Construction

1. “The employer shall assign a **competent person** who shall perform all air monitoring required by this section (Subpart S; 29 CFR 1926.800(j)(1)(i)(A)).”
2. “Where this paragraph requires monitoring of airborne contaminants ‘as often as necessary,’ the **competent person** shall make a reasonable determination as to which substances to monitor and how frequently to monitor (Subpart S; 29 CFR 1926.800(j)(1)(i)(B)).” The standard indicates the following factors should be considered:
 - a. Location of jobsite: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;
 - b. Geology: Geological studies of the jobsite, particularly involving the soil type and its permeability;
 - c. History: Presence of air contaminants in nearby jobsites, changes in levels of substances monitored on the prior shift; and
 - d. Work practices and jobsite conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decompression of the atmosphere, welding, cutting and hot work, and employees’ physical reactions to working underground.
3. “When the **competent person** determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall:
 - a. Prominently post a notice at all entrances to the underground jobsite to inform all entrants of hazardous condition, and
 - b. Ensure that the necessary precautions are taken (Subpart S; 29 CFR 1926.800(j)(1)(iv))”

4. "When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a **competent person** shall test all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed (Subpart S; 29 CFR 1926.800(k)(7))."
5. "A **competent person** shall inspect the roof (back), face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability (Subpart S; 29 CFR 1926.800(o)(3)(i)(A))."
6. "A **competent person** shall determine whether rock bolts meet the necessary torque, and shall determine the testing frequency in light of the bolt system, ground conditions and the distance from vibration sources (Subpart S; 29 CFR 1926.800(o)(3)(iv)(B))."
7. "After blasting operations in shafts, a **competent person** shall determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, necessary repairs shall be made before employees other than those assigned to make the repairs are allowed in or below the affected areas (Subpart S; 29 CFR 1926.800(o)(4)(iii))."
8. "A **competent person** shall inspect all drilling and associated equipment prior to each use. Equipment defects affecting safety shall be corrected before the equipment is used (Subpart S; 29 CFR 1926.800(q)(1))."
9. "A **competent person** shall inspect haulage equipment before each shift (Subpart S; 29 CFR 1926.800(r)(1)(i))."
10. "A **competent person** shall visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary (Subpart S; 29 CFR 1926.800(t)(3)(xix))."
11. "Each safety device shall be checked by a **competent person** at least weekly during hoist use to ensure suitable operation and safe condition (Subpart S; 29 CFR 1926.800(t)(3)(xx))."

U. Compressed Air

1. "There shall be present, at all times, at least one **competent person** designated by and representing the employer, who shall be familiar with this Subpart in all respects, and responsible for full compliance

with these and other applicable subparts (Subpart S; 29 CFR 1926.803(a)(1)).”

2. “At all times there shall be a thoroughly experienced, **competent**, and reliable **person** on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings provided that the gauge and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson (Subpart S; 29 CFR 1926.803(h)(1)).”

V. Demolition – Preparatory Operations

“Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a **competent person**, of the structure to determine the condition of the framing, floors, and walls, and possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing evidence that such a survey has been performed (Subpart T; 29 CFR 1926.850(a)).”

W. Mechanical Demolition

“During demolition, continuing inspections by a **competent person** shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means (Subpart T; 29 CFR 1926.859(g)).”

X. Blasting and the Use of Explosives

1. Precautions taken to prevent the accidental discharge of electric blasting caps shall include “the prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of blasting operations. Whenever adherence to the 1,000-foot distance would create an operational handicap, a **competent person** shall be consulted to evaluate the particular situation, and alternative provisions may be made which are adequately designed to prevent any premature firing of electric blasting caps. A description of any such alternatives shall be reduced to writing and shall be certified as meeting the purposes of this subdivision by the **competent person** consulted. The description shall be maintained at the construction site during the duration of the work, and shall be available for inspection by representatives of the Secretary Labor (Subpart U; 29 CFR 1926.900(k)(3)(i)).”

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2. “The blaster shall be knowledgeable and **competent** in the use of each type of blasting method used (Subpart U; 29 CFR 1926.901(e)).”

Y. Ladders

1. “Ladders shall be inspected by a **competent person** for visible defects on a periodic basis and after any occurrence that could affect their safe use (Subpart X; 29 CFR 1926.1053(b)).”
2. “The employer shall ensure that each employee has been trained by a **competent person** in the following areas, as applicable:
 - a. The nature of fall hazards in the work area;
 - b. The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
 - c. The proper construction, use, placement, and care in handling of all stairways and ladders;
 - d. The maximum intended load-carrying capacities of ladders used; and
 - e. The standards contained in this subpart (Subpart X; 29 CFR 1926.1060(a)(1)).”

Z. Toxic Substances – Asbestos

1. “**Competent person** means, in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f): in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).” (Subpart Z; 29 CFR 1926.1101(b))
2. “The **competent** person shall examine worksuits worn by employees at least once per workshift for rips or tears that may occur during performance of work (Subpart Z; 29 CFR 1926.1101(i)(4)(i)).”

3. "On all construction worksites covered by this standard, the employer shall designate a **competent person**, having the qualifications and authorities for ensuring worker safety and health required by Subpart C, General Safety and Health Provisions for Construction (Subpart Z; 29 CFR 1926.1101(o)(1))."
4. "The **competent person** shall make frequent and regular inspections of the job sites, in order to perform the duties set out below in paragraph (o)(3)(i) and (ii) of this section. For Class I jobs, on-site inspections shall be made at least once during each work shift, and at any time at employee request. For Class II, III, and IV jobs, on-site inspections shall be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time at employee request (Subpart Z; 29 CFR 1926.1101(o)(3))."
5. "On all worksites where employees are engaged in Class I or II asbestos work, the **competent person** shall perform or supervise the following duties, as applicable:
 - a. Set up the regulated area, enclosure, or other containment;
 - b. Ensure (by on-site inspection) the integrity of the enclosure;
 - c. Set up procedures to control entry to and exit from the enclosure and/or area;
 - d. Supervise all employee exposure monitoring required by this section and ensure that it is conducted as required by paragraph (f) of this section;
 - e. Ensure that employees working within the enclosure and/or using glove bags wear respirators and protective clothing as required by paragraphs (h) and (i) of this section;
 - f. Ensure through on-site supervision, that employees set up, use, and remove engineering controls, use work practices and personal protective equipment in compliance with all requirements;
 - g. Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in paragraph (j) of this section;

- h. Ensure that through on-site inspection, engineering controls are functioning properly and employees are using proper work practices; and,
 - i. Ensure that notification requirement in paragraph (k) of this section are met (Subpart Z; 29 CFR 1926.1101(o)(3)(i)).”
- 6. “For Class I and II asbestos work the **competent person** shall be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors that meets the criteria of EPA’s Model Accreditation Plan (40 CFR part 763, subpart E, Appendix C), such as a course conducted by an EPA-approved or state-approved training provider, certified by EPA or a state, or a course equivalent in stringency, content, and length (Subpart Z; 29 CFR 1926.1101(o)(4)(i)).”
- 7. “For Class III and IV asbestos work, the **competent person** shall be trained in aspects of asbestos handling appropriate for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of this standard, and the identification of asbestos. Such training shall include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content and length (Subpart Z; 29 CFR 1926.1101(o)(4)(ii)).”

AA. Toxic Substances – Cadmium

- 1. “**Competent person**, in accordance with 29 CFR 1926.32 (f), means a person designated by the employer to act on the employer’s behalf who is capable of identifying existing and potential cadmium hazards in the workplace and the proper methods to control them in order to protect workers, and has the authority necessary to take prompt corrective measures to eliminate or control such hazards. The duties of a **competent person** include at least the following: Determining prior to the performance of work whether cadmium is present in the workplace; establishing, where necessary, regulated areas and assuring that access to and from those areas is limited to authorized employees; assuring the adequacy of any employee exposure monitoring required by this standard; assuring that all employees exposed to air cadmium levels above the PEL wear appropriate

personal protective equipment and are trained in the use of appropriate methods of exposure control; assuring that proper hygiene facilities are provided and that workers are trained to use those facilities; and assuring that the engineering controls required by this standard are implemented, maintained in proper operating condition, and functioning properly (Subpart Z; 29 CFR 1926.1127(b)).”

2. “Prior to the performance of any construction work where employees may be potentially exposed to cadmium, the employer shall establish the applicability of this standard by determining whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. The employer shall designate a **competent person** who shall make this determination. Investigation and material testing techniques shall be used, as appropriate, in the determination. Investigation shall include a review of relevant plans, past reports, material safety data sheets, and other available records, and consultations with the property owner and discussions with appropriate individuals and agencies (Subpart Z; 29 CFR 1926.1127(d)(1)(i)).”
3. “Where cadmium has been determined to be present in the workplace, and it has been determined that there is a possibility the employee’s exposure will be at or above the action level, the **competent person** shall identify employees potentially exposed to cadmium at or above the action level (Subpart Z; 29 CFR 1926.1127(d)(1)(ii)).”
4. “The employer also shall institute the exposure monitoring required under paragraphs (d) (2) (i) and (d) (3) of 29 CFR 1926.1127 whenever there has been a change in the raw materials, equipment, personnel, work practices, or finished products that may result in additional employees being exposed to cadmium at or above the action level or in employees already exposed to cadmium at or above the action level being exposed above the PEL, or whenever the employer or **competent person** has any reason to suspect that any other change might result in such further exposure (Subpart Z; 29 CFR 1926.1127(d)(4)).”
5. “A **competent person** shall review the comprehensive compliance program initially and after each change (Subpart Z; 29 CFR 1926.1127(f)(5)(iii)).”

BB. Toxic Substances – 1,2-Dibromo-3-Chloropropane

“Since many of the duties relating to employee protection are dependent on the results of monitoring and measuring procedures, employers should

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assure that the evaluation of employee exposures is performed by a **competent** industrial hygienist or other technically qualified **person** (Subpart Z; 29 CFR 1926.1144; makes direct reference to 29 CFR 1910.1044, Appendix B, IV.B).”

CC. Toxic Substances – Acrylonitrile

“Since many of the duties relating to employee exposure are dependent on the results of monitoring and measuring procedures, employers shall assure that the evaluation of employee exposures is performed by a **competent** industrial hygienist or other technically qualified **person** (Subpart Z; 29 CFR 1926.1145; makes direct reference to 29 CFR 1910.1045, Appendix B, IV.B).”

This supplement defines and lists the areas within the OSHA General Industry Standards where a competent person is required to be part of a particular project activity.

A. Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms

1. “**Competent person** means a person who, because of training and experience, is capable of identifying hazardous or dangerous conditions in powered platform installations and of training employees to identify such conditions (Subpart F; 29 CFR 1910.66(d)).”
2. “Related building supporting structures shall undergo periodic inspection by a **competent person** at intervals not exceeding 12 months (Subpart F; 29 CFR 1910.66(g)(2)(i)).”
3. “All parts of the equipment including control systems shall be inspected, and, where necessary, tested by a **competent person** at intervals specified by the manufacturer/supplier, but not to exceed 12 months, to determine that they are in safe operating condition. Parts subject to wear, such as wire ropes, bearings, gears, and governors shall be inspected and/or tested to determine that they have not worn to such an extent as to affect the safe operation of the installation (Subpart F; 29 CFR 1910.66(g)(2)(ii)).”
4. “A maintenance inspection and, where necessary, a test shall be made of each platform installation every 30 days, or where the work cycle is less than 30 days such inspection and/or test shall be made prior to each work cycle. This inspection and test shall follow procedures recommended by the manufacturer, and shall be made by a **competent person** (Subpart F; 29 CFR 1910.66(g)(3)(i)).”
5. “Inspection of governors and secondary brakes shall be performed by a **competent person** (Subpart F; 29 CFR 1910.66(g)(4)(v)).”
6. “Suspension wire rope shall be inspected by a **competent person** for visible defects and gross damage to the rope before every use and after each occurrence which might affect the wire rope's integrity (Subpart F; 29 CFR 1910.66(g)(5)(ii)).”
7. “A thorough inspection of suspension wire ropes in service shall be made once a month. Suspension wire ropes that have been inactive for 30 days or longer shall have a thorough inspection before they are placed into service. These thorough inspections of suspension wire

ropes shall be performed by a **competent person** (Subpart F; 29 CFR 1910.66(g)(5)(iii)).”

8. “Any other condition which the **competent person** determines has significantly affected the integrity of the rope (Subpart F; 29 CFR 1910.66(g)(5)(iv)(J)).”
9. “Training of employees in the operation and inspection of working platforms shall be done by a **competent person** (Subpart F; 29 CFR 1910.66(i)(1)(iii)).”
10. “**“Competent person”** means a person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as in their application and use with related equipment (Subpart F; 29 CFR 1910.66 App. C, (I)(b)).”
11. “Personal fall arrest systems or components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection unless inspected and determined by a **competent person** to be undamaged and suitable for reuse (Subpart F; 29 CFR 1910.66 App. C, (I)(e)(7)).”
12. “**“Comment compatibility considerations.”** Ideally, a personal fall arrest system is designed, tested, and supplied as a complete system. However, it is common practice for lanyards, connectors, lifelines, deceleration devices, body belts and body harnesses to be interchanged since some components wear out before others. The employer and employee should realize that not all components are interchangeable. For instance, a lanyard should not be connected between a body belt (or harness) and a deceleration device of the self-retracting type since this can result in additional free fall for which the system was not designed. Any substitution or change to a personal fall arrest system should be fully evaluated or tested by a **competent person** to determine that it meets the standard, before the modified system is put in use (Subpart F; 29 CFR 1910.66 App. C, (III)(c)).”

B. Explosives and Blasting Agents

1. “Magazines shall be in the charge of a **competent person** at all times and who shall be held responsible for the enforcement of all safety precautions (Subpart H; 29 CFR 1910.109(c)(5)(viii)).”
2. “Explosives recovered from blasting misfires shall be placed in a separate magazine until **competent personnel** have determined from the manufacturer the method of disposal.

Caps recovered from blasting misfires shall not be reused. Such explosives and caps shall then be disposed of in the manner recommended by the manufacturer (Subpart H; 29 CFR 1910.109(c)(5)(ix)).”

3. “Extinguishers shall be filled and ready for immediate use and located near the driver's seat. Extinguishers shall be examined periodically by a **competent person** (Subpart H; 29 CFR 1910.109(d)(2)(iii)(b)).”
4. “The distances in the table apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer promulgated by the National Plant Food Institute; and ammonium nitrate failing to pass said test shall be stored at separation distances determined by **competent persons** (Subpart H, 29 CFR 1910.109, Table H-22, Footnote (3)).”
5. “Every warehouse used for the storage of blasting agents shall be under the supervision of a **competent person** (Subpart H, 29 CFR 1910.109(g)(5)(vii)).”

C. Helicopters

“Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The employer shall ensure that the hooks are tested prior to each day's operation by a **competent person** to determine that the release functions properly, both electrically and mechanically (Subpart N, 29 CFR 1910.183(d)).”

D. Slings

1. “**Inspections.** Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a **competent person** designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service (Subpart N, 29 CFR 1910.184(d)).”
2. “The thorough inspection of alloy steel chain slings shall be performed by a **competent person** designated by the

employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service (Subpart N, 29 CFR 1910.184(e)(3)(iii)).”

E. Telecommunications

1. “**Support structures.** No employee, or any material or equipment, may be supported or permitted to be supported on any portion of a pole structure, platform, ladder, walkway or other elevated structure or aerial device unless the employer ensures that the support structure is first inspected by a **competent person** and it is determined to be adequately strong, in good working condition and properly secured in place (Subpart R, 29 CFR 1910.268(b)(6)).”
2. “**Tools and personal protective equipment -- Generally.** Personal protective equipment, protective devices and special tools needed for the work of employees shall be provided and the employer shall ensure that they are used by employees. Before each day's use the employer shall ensure that these personal protective devices, tools, and equipment are carefully inspected by a **competent person** to ascertain that they are in good condition (Subpart R, 29 CFR 1910.268(e)).”
3. “**General.** Safety belts and straps shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet above ground, on poles, and on towers, except as provided in paragraphs (n)(7) and (n)(8) of this section. No safety belts, safety straps or lanyards acquired after July 1, 1975 may be used unless they meet the tests set forth in paragraph (g)(2) of this section. The employer shall ensure that all safety belts and straps are inspected by a **competent person** prior to each day's use to determine that they are in safe working condition (Subpart R, 29 CFR 1910.268(g)(1)).”
4. “The employer shall ensure that pole climbers are inspected by a **competent person** for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used (Subpart R, 29 CFR 1910.268(g)(3)(ii)).”

5. “The employer shall ensure that no employee nor any material or equipment may be supported or permitted to be supported on any portion of a ladder unless it is first determined, by inspections and checks conducted by a **competent person** that such ladder is adequately strong, in good condition, and properly secured in place, as required in Subpart D of this part and as required in this section (Subpart R, 29 CFR 1910.268(h)(1)).”
6. “The employer shall ensure that visual inspections are made of the equipment by a **competent person** each day the equipment is to be used to ascertain that it is in good condition (Subpart R, 29 CFR 1910.268(j)(1)(i)).”
7. “The employer shall ensure that tests shall be made at the beginning of each shift by a **competent person** to insure the vehicle brakes and operating systems are in proper working condition (Subpart R, 29 CFR 1910.268(j)(1)(ii)).”
8. “The employer shall ensure that the derrick and its associated equipment are inspected by a **competent person** at intervals set by the manufacturer but in no case less than once per year. Records shall be maintained including the dates of inspections, and necessary repairs made, if corrective action was required (Subpart R, 29 CFR 1910.268(j)(4)(iv)(F)).”

**URS SAFETY MANAGEMENT STANDARD 05 □
DRILLING SAFETY GUIDELINES**

URS SAFETY MANAGEMENT STANDARD

Drilling Safety Guidelines

1. Applicability

This standard applies to URS Corporation and its subsidiary companies on projects using truck-mounted or other engine-powered drill rigs. The primary responsibility for drilling safety is with the drilling contractor.

2. Purpose and Scope

The purpose of this standard is to provide an overview for working safely around drilling operations with truck-mounted and other engine-powered drill rigs. The procedure addresses off-road movement of drill rigs, overhead and buried utilities, the use of augers, rotary and core drilling, and other drilling operations and activities. More detailed drilling safety guidelines are provided in the document *Environmental Remediation Drilling Safety Guidelines*.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

Drill rig safety and maintenance is the responsibility of the drill rig operator. Drilling subcontractors must be qualified in accordance with SMS 046 – Subcontractor Health and Safety Requirements.

4. Requirements

A. General Safety Guidelines

URS technicians, geologists, engineers, or other field staff assigned to oversee drilling operations or collect soil samples will observe the following guidelines:

1. Require a meeting at project startup regarding the drill rig operator's responsibility for rig safety, and any site- and equipment-specific safety requirements.
2. Excluding geoprobe activities, set up any sample tables and general work areas for the URS field staff at a distance of at least the height of the fully extended mast plus 5 feet (1.52 meters), and no less than 30 feet (10 meters) from the rig.
3. URS engineers, technicians, and geologists will not assist the drillers with drilling equipment or supplies, and will not operate the drill rig controls except to activate the emergency shutoff, if needed.

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Drilling Safety Guidelines

4. Require that all rotary drilling equipment have an emergency shut off/ kill switch. The location of the switch should be reviewed with all field staff.
5. Drilling rigs shall be inspected by the lead driller prior to use daily. Attachment 056-1 NA – Drill Rig Inspection Checklist may be utilized to document the inspection.

B. Movement of Drill Rigs

1. Before moving a rig, the operator must do the following:
 - a. To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.
 - b. Check the brakes of the truck/carrier, especially if the terrain along the route of travel is rough or sloped.
 - c. Discharge all passengers before moving on rough or steep terrain.
 - d. Engage the front axle (on 4x4, 6x6, etc., vehicles) before traversing rough or steep terrain.
2. Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator must conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility must be considered that the presence of drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).
3. Logs, ditches, road curbs, and other long and horizontal obstacles should be approached and driven over squarely, not at an angle.
4. When close lateral or overhead clearance is encountered, the driver of the rig should be guided by another person on the ground.
5. Loads on the drill rig and truck must be properly stored while the truck is moving, and the mast must be in the fully lowered position.
6. After the rig has been positioned to begin drilling, all brakes and/or locks must be set before drilling begins. If the rig is positioned on a steep grade and leveling of the ground is impossible or impractical, the wheel of the transport vehicle must be blocked and other means employed of preventing the rig from moving or toppling over.

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Drilling Safety Guidelines

C. Buried and Overhead Utilities

1. The location of overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans and/or assignment sheets.
2. When overhead power lines are close by, the drill rig mast should not be raised unless the distance between the rig and the nearest power line is at the minimum distance stated in SMS 034 – Utility Clearances and Isolation. The drill rig operator or assistant should walk completely around the rig to make sure that adequate clearance exists.
3. The rig operator should be aware that when the drill rig is positioned near an overhead line, hoist lines and power lines can be moved towards each other by wind. When necessary and approved by the project manager, the utility and/or power lines may be shielded, shut down, or moved by the appropriate personnel.
4. Before performing work, for additional information, please refer to SMS 034 – Utility Clearances and Isolation.

D. Clearing the Work Area

1. Before a drill rig is positioned to drill, the area on which the rig is to be positioned must be cleared of removable obstacles and the rig must be leveled if it is sloped. The cleared/leveled area should be large enough to accommodate the rig and supplies.

E. Safe Use of Augers

1. Never place hands or fingers under the bottom of an auger flight or drill rods when hoisting the augers or rods over the top of another auger or rod in the ground or other hard surfaces, such as the drill rig platform.
2. Never allow feet to get under the auger or drill rod while they are being hoisted.
3. When the drill is rotating, stay clear of the drill string and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.
4. Move auger cuttings away from the auger with a long-handled shovel or spade; never use hands or feet.

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5. Never clean an auger attached to the drill rig unless the transmission is in neutral or the engine is off, and the auger has stopped rotating.
6. Do not wear loose clothing or jewelry while working near the drill rig. Long hair must be pulled back to avoid entanglement with moving parts.
7. Hearing protection is required when working near an operating drill rig.

F. Rod Separation

1. Do not use manual tools (e.g., pipe wrenches) in combination with rotation of the drill stem. Manual tools are not designed for the load, and may break. The use of such tools creates a significant impact hazard for those in the work area, because they rotate with the drill stem. URS does not permit drillers to use manual tools in combination with a rotating drill stem to break rods. Manual tools may be used if the drill stem is isolated/positively disengaged.
2. Mechanical means of rod separation that are permitted include:
 - a. Opposing hydraulic controls.
 - b. Rod locking devices.
 - c. Hydraulic breakout tools.
 - d. Hydraulic foot clamps.

G. Safe Use of Hand Tools

Review SMS 064 – Hand Safety for information regarding hand tools in addition to the guidelines provided below:

1. Use each tool to perform only tasks for which it was originally designed.
2. Repair damaged tools before use, or discard them.
3. Wear safety goggles or glasses when using a hammer or chisel. Nearby co-workers and bystanders are required to wear safety goggles or glasses also, or move away.
4. Clean tools and store them in an orderly manner when they are not in use.

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Drilling Safety Guidelines

H. Safe Use of Wire Line Hoists, Wire Rope, and Hoisting Hardware

1. Whenever wire line hoists, wire rope, or hoisting hardware are used, the safety rules described in Title 29 Code of Federal Regulations (CFR) 1926.552, and guidelines contained in the Wire Rope User's Manual published by the American Iron and Steel Institute, will be followed. The driller will provide written reports (upon request) documenting inspections of equipment.

I. Traffic Safety

1. Drilling in streets, parking lots, or other areas of vehicular traffic requires definition of the work zones with cones, warning tape, etc., and compliance with local police requirements. Refer to SMS 032 – Work Zone Traffic Control.

J. Fire Safety

1. Fire extinguishers (type ABC) will be kept on or near drill rigs for fighting small fires.
2. If methane or other flammable gases or vapors are suspected in the area, a combustible gas indicator (CGI) will be used to monitor the air near the borehole, with all work to stop at 20 percent of the Lower Explosive Limit (LEL).
3. Work must stop during lightning storms.

K. Drilling at Potential MEC/UXO Sites

If the project site is suspected of containing munitions and explosives of concern (MEC) or unexploded ordnance (UXO), the UXO team will conduct a reconnaissance and MEC/UXO avoidance to provide clear access routes to each site before drilling crews enter the area. The following procedures will be implemented:

1. Drilling operations on an MEC/UXO site will not be conducted until a complete plan for the site is prepared and approved by the URS UXO Safety Officer. MEC/UXO avoidance must be conducted during drilling operations on known or suspect MEC/UXO sites. Refer to SMS 039 – Munitions Response/Munitions and Explosives of Concern.
2. The UXO team will identify and distinctly mark the boundaries of a clear approach path for the drilling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the

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widest vehicle. No personnel will be allowed outside any marked boundary.

3. If MEC/UXO is encountered on the ground surface, the UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
4. The UXO team will conduct an access survey using the appropriate geophysical instrument over the approach path for avoidance of MEC/UXO that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be MEC/UXO, and the approach path will be diverted around the anomaly. UXO personnel only will operate the appropriate geophysical instrument and identify MEC/UXO.
5. An incremental geophysical survey of the drill-hole location(s) will be initially accomplished by the UXO team using a hand auger to install a pilot hole. If MEC/UXO is encountered or an anomaly cannot be positively identified as inert material, Hazardous, Toxic, and Radioactive Waste (HTRW) sampling personnel will select a new drill-hole location.
6. Once the surface of a drilling site has been cleared and a pilot hole established as described above, the drilling contractor will be notified that the site is available for subsurface drilling.
7. Additional guidance for MEC/UXO support during drilling activities is provided in SMS 039 – Munitions Response/Munitions and Explosives of Concern.

L. Protective Gear

1. Minimum Protective Gear

At a minimum, items listed below must be worn by all staff working within 30 feet (10 meters) of drilling activities.

- a. Hearing protection.
- b. Hard hat.
- c. Eye protection (safety glasses, goggles, or face-shield).
- d. Safety shoes (steel-toed shoes or boots).

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2. Other Gear

Items listed below must be worn when conditions warrant their use. Some of the conditions are listed after each item.

- a. Safety Harnesses and Lifelines: Safety harnesses and lifelines must be worn by all persons working on top of an elevated derrick beam or mast. Lifelines should be secured at a position that will allow a person to fall no more than 6 feet (2 meters). OSHA Fall Protection (1926 Subpart M) requirements apply. Refer to SMS 040 – Fall Protection for additional information.
- b. Life Vests: Life vests must be used for work over water. Refer to SMS 027 – Work Over Water for additional information.

5. Resources

- A. International Association of Drilling Contractors Safety Alerts
<http://iadc.org/alerts.htm>
- B. U.S. Occupational Safety and Health Administration (OSHA) Standard Fall Protection – [29 CFR 1926 Subpart M](#)
- C. U.S. OSHA - [29 CFR 1926.552](#), Material Hoists, Personnel Hoists and Elevators
- D. [Environmental Remedial Safety Drilling Guidelines](#)
- E. [SMS 026](#) – Noise and Hearing Conservation
- F. [SMS 027](#) – Work Over Water
- G. [SMS 032](#) – Work Zone Traffic Control
- H. [SMS 034](#) – Utility Clearances and Isolation
- I. [SMS 039](#) – Munitions Response/Munitions and Explosives of Concern
- J. [SMS 040](#) – Fall Protection
- K. [SMS 046](#) – Subcontractor Health and Safety Requirements
- L. [SMS 064](#) – Hand Safety
- M. [Attachment 056-1 NA](#) – Drill Rig Inspection Checklist



Health, Safety and Environment
DRILL RIG INSPECTION CHECKLIST

Attachment 056-1 NA
Issue Date: December 2009

Inspect flights/augers for metal burns. NOTE: Burrs must be filed to flat surface.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Avoid stacking augers; all should lay flat on ground.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Avoid manually lifting/moving augers. Should be lifted/moved with cable lines, or, at a minimum, by two persons.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Drill String	
Drill string should not be bent or have any cracks/fractures.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Drill string connecting pins should not be bent, have any cracks/fractures, or be excessively worn.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Mast	
Mast is free of bends, cracks, or broken sections.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
All mounting hardware (pins, bolts, etc) should be in place.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
No moving of drill rig while mast is in vertical position.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Maintenance/repairs to be performed on mast only in horizontal position.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammering Device	
Hammer free of cracks, fatigue, or other signs of excessive wear.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammer connections are secure.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Leveling Devices	
Outriggers move in/out and up/down smoothly and freely while using controls on drill rig, with no hydraulics leaks.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are extended prior to and whenever the mast is raised off its cradle. Outriggers must maintain pressure to continuously support and stabilize the drill rig (even while unattended).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are properly supported on the ground surface to prevent setting into the soil (use of outrigger support pads).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls	
Controls are intact, properly labeled, have freedom of movement, and have no loose wiring or connections.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls are not blocked or locked into an operating position.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Installed lights, signals, gauges, and alarms operate properly.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Lifting Devices	
Slings, chokers, and lifting devices are inspected before using and are in proper working order. NOTE: Damaged units are to be labeled and removed from jobsite.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Shackles/Clevises are in proper working order with pins/screws in place that is to be used while lifting.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cables and lifting devices are not operated erratically or with a jerking action to overcome resistance.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic System	
Hydraulic lines are secure, in good condition with no signs of excessive wear, and not leaking. NOTE: Check while pressurized.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic lines are not in a bent or pinched position causing additional fluid restrictions/pressures.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic oil reservoir has appropriate amount of oil and not leaking.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Documentation available to confirm that pressure relief valve was checked during shop maintenance activity and noted on maintenance log.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pump Lines (water, grout, etc)	
Suction/Discharge hoses, pipes, valves, and fittings are secured and not leaking.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
High pressure hoses have a safety chain, cable, or strap at each end to prevent whipping in the event of a failure.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Fire Prevention	
A fire extinguisher of appropriate size is located on drill rig and readily available/accessible for drilling crew (recommended 20 lb).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A



Health, Safety and Environment
DRILL RIG INSPECTION CHECKLIST

Attachment 056-1 NA
Issue Date: December 2009

Ladders	
Drill rig has a permanently attached or proper portable ladder to be used for access to drilling platform.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Tracks	
Tracks on rig are not excessively worn and free of any debris or foreign material.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
General	
Drill rig meets regulations for transport on state/federal highways (inspection sticker, license plate, etc.).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Does the rig size meet job requirements?	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Maintenance log available for previous 3 months to confirm proper maintenance/inspection.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Exhaust	
Exhaust system should be free from defect and routes engine exhaust away from drill rig workers.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Fuels	
Fuel stored in an approved and properly labeled container.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Fuel transfer lines free from signs of excessive wear and not leaking.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Refueling and transferring of fuel is performed in an approved area with sufficient containment to prevent spillage.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Exclusion/Work Zones	
The exclusion/work zone is centered over the borehole and the radius equal to or greater than the height of the mast (measured from ground level).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
The exclusion/work zone should be clear of tripping hazards.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Overhead Obstructions	
Except where electrical distribution and transmission lines have been de-energized and visibly grounded, drill rigs will be operated proximate to under, by, or near power lines in accordance with the following: <ul style="list-style-type: none"> • 50 KV or less – minimum clearance of 10 feet • 50 KV or greater – add 0.4 inches for every KV over 50 KV • If voltage is unknown, maintain at least 20 feet of clearance 	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Rig Repairs	
Repairs, when possible, are conducted offsite to reduce the risk of any onsite incidents.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Specialized PPE	
When working at elevated heights, workers are to wear a fall restraining device attached in a manner to restrict falls to less than six feet.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
When working in wet/slippery conditions, all workers have a lug-type sole or similar slip resistant sole, on their safety footwear to prevent slipping.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A

Comments:

Signature of Inspector: _____ Date: _____

URS SAFETY MANAGEMENT STANDARD 05
OLD STRESS

URS SAFETY MANAGEMENT STANDARD

Cold Stress

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where field crews are working outdoors in damp and cool (below 50 degrees Fahrenheit [°F] or 10 degrees Celsius [°C]) conditions or anytime temperatures are below 32°F or 0°C.

2. Purpose and Scope

The purpose of this standard is to protect project personnel from hypothermia and frostbite.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

- A. Carefully plan work anticipated to be performed in cool or cold conditions. Include costs in project budgets for specialized equipment and supplies needed to complete the field activities.
- B. Monitor weather forecasts immediately prior to entering the field. If possible, schedule heavy work during the warmer parts of the day. Implement a work-warming regimen by taking breaks out of the cold.
- C. Observe and monitor weather conditions such as ambient temperature, wind speed, and precipitation while in the field. If needed, use Supplemental Information B to determine wind chill.
- D. Wearing the right clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. Adequate insulating dry clothing will be required in air or wind chill temperatures below 40 °F (4.4 °C).
 1. Wear at least 3 layers of clothing to help prevent cold stress. It is important to preserve the air space between the body and the outer layer of clothing to retain body heat.
 2. Wear an outer layer to break the wind and allow some ventilation (e.g., Gortex® or nylon).

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3. Wear a middle layer of down, wool, or similar materials to provide insulation.
 4. Wear an inner layer of cotton or synthetic weave to allow ventilation.
 5. Wear a hat or hardhat liner. Up to 40 percent of body heat can be lost when the head is left exposed.
 6. Wear insulated boots or other insulated footwear, and insulated gloves to help reduce the chance of frostbite.
 7. Keep a change of dry clothing available in case work clothes become wet.
 8. Do not wear tight clothing. Loose clothing allows better ventilation.
 9. Skin should not be left exposed on a continuous basis when air temperature or chill factors are below -17°F (-27°C).
 10. Drink plenty of liquids, avoiding caffeine and alcohol, which are vasoconstrictors. It is easy to become dehydrated in cold weather.
- E. Use the following work practices:
1. Use Supplemental Information C to establish work/rest cycles in cold weather.
 2. Drink plenty of warm liquids. It is easy to become dehydrated in cold weather.
 3. Avoiding caffeine and alcohol. Alcohol will accelerate loss of body heat.
 4. Eat high calorie snacks to help maintain body metabolism.
 5. If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold.
 6. Work in pairs to keep an eye on each other and watch for signs of cold stress.
 7. NEVER IGNORE SHIVERING. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
 8. Avoid exhaustion.

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Cold Stress

- F. When possible, use the following engineering controls:
1. Provide shelter to escape cold, wind, and precipitation
 2. Provide a source of heat (such as warm packs or portable heaters).
 3. Use insulating materials on equipment handles when temperatures drop below 30°F (-1°C).
- G. Watch for symptoms and signs of hypothermia. Work in pairs to keep an eye on each other and watch for signs of cold stress.
- H. Treat cold stress illness as follows:
1. Hypothermia: Prompt treatment of hypothermia is essential. Once the body temperature drops below 95°F (35°C), the loss of temperature control occurs, and the body can no longer rewarm itself. Initial treatment includes reducing heat loss by moving the individual out of the wind and cold, removing wet clothing, applying external heat (such as a pre-warmed sleeping bag, electric blanket, or body-heat from other workers), and obtaining follow-up medical attention.
 2. Frost Bite: The initial treatment for frostbite includes bringing the individual to a warm location, removing clothing in the affected area, and, **if help is delayed**, placing the affected parts in warm (100° to 104°F or 38° to 40°C) water. Do not massage or rub the frostbite area. After the initial treatment, wrap the affected area loosely in sterile gauze and seek medical attention.

For further discussion on Cold Stress treatment, please refer to Supplemental Information A.

- I. Hypothermia in Water:

Loss of body heat to the water is a major cause of deaths in boating and working near water incidents. Often the cause of death is listed as drowning; however, the primary cause is often hypothermia. It should also be noted that alcohol lowers the body temperature around 2 to 3 degrees by dilating the blood vessels. Do not drink alcohol around cold water. The following table shows the effects of hypothermia in water:

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Cold Stress

WATER TEMPERATURE	EXHAUSTION	SURVIVAL TIME
32.5°F (0°C)	Under 15 minutes	Under 15 to 45 minutes
32.5 to 40°F (0 to 4°C)	15 to 30 minutes	30 to 90 minutes
40 to 50°F (4 to 10°C)	30 to 60 minutes	1 to 3 hours
50 to 60°F (10 to 16°C)	1 to 2 hours	1 to 6 hours
60 to 70°F (16 to 21°C)	2 to 7 hours	2 to 40 hours
60 to 70°F (16 to 21°C)	3 to 12 hours	3 hours to indefinite
Over 80°F (27°C)	Indefinite	Indefinite

SOME POINTS TO REMEMBER:

1. Wear your PFD. Review SMS 027 – Work Over Water, SMS 053 – Marine Safety and Boat Operations and SMS 095 – Barge Operations.
2. If the water is less than 50°F (10°C), wear a wet suit or dry suit for work in water (e.g., wading), or if a significant potential to fall in water exists.
3. While in the water, do not attempt to swim unless to reach nearby safety. Unnecessary swimming increases the rate of body heat loss. Keep your head out of the water. This will increase your survival time.
4. Keep a positive attitude about your rescue. This will increase your chances of survival.
5. If there is more than one person in the water, huddling is recommended.

J. Training

Workers at risk of developing hypothermia or cold-related injury will be trained in:

1. Recognition of the signs and symptoms of cold injury or impending hypothermia;

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Cold Stress

2. Proper re-warming procedures and appropriate first aid treatment;
3. Proper use of clothing;
4. Proper eating and drinking practices; and
5. Safe work practices appropriate to the work that is to be performed.

5. Documentation Summary

The following documentation will be maintained in the project file:

- A. Cold stress training records.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) Fact Sheets – [“Protecting Workers in Cold Environments”](#)
- B. [OSHA Publication 3156 – Quick Reference Card](#)
- C. [SMS 027](#) – Work Over Water
- D. [SMS 053](#) – Marine Safety and Boat Operations
- E. [SMS 095](#) – Barge Operations

7. Supplemental Information

- A. [Signs of, and Treatment for, Cold Stress-Related Illnesses](#)
- B. [Wind Chill Index](#) (units in °F and miles/hour, and units in °C and Kilometers/hour)
- C. [Work/Warm-up Schedule for Outside Workers](#) based on a Four-Hour Shift

Hypothermia: Hypothermia results when the body loses heat faster than it can be produced. When this situation first occurs, blood vessels in the skin constrict in an attempt to conserve vital internal heat. Hands and feet are first affected. If the body continues to lose heat, involuntary shivers begin. This is the body's way of attempting to produce more heat, and it is usually the first real warning sign of hypothermia. Further heat loss produces speech difficulty, confusion, loss of manual dexterity, collapse, and finally death. Wet clothes or immersion in cold water greatly increases the hypothermia risk. The progressive clinical presentation of hypothermia is described in the table below.

Frostbite: Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite can be categorized into:

- **Frost Nip or Initial Frostbite:** (1st degree frostbite) Characterized by blanching or whitening of skin.
- **Superficial Frostbite:** (2nd degree frostbite) Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient. Blistering and peeling of the frozen skin will follow exposure.
- **Deep Frostbite:** (3rd degree frostbite) Tissues are cold, pale, and solid; extremely serious injury with possible amputation of affected area.

Frostbite can occur without hypothermia when the extremities do not receive sufficient heat. The toes, fingers, cheeks, and ears are the most commonly affected. Frostbite occurs when there is freezing of the fluids around the cells of the affected tissues. The first symptom of frostbite is an uncomfortable sensation of coldness, followed by numbness. There may be tingling, stinging, or cramping. Contact by the skin with tools or other metal objects below 20°F (-7°C) may result in contact frostbite.

Condition	Signs/Symptoms	Treatment
Hypothermia Mild (98° - 90° F) (36° - 32°C)	<ul style="list-style-type: none"> • shivering • lack of coordination • stumbling, fumbling hands • slurred speech • memory loss • pale, cold skin 	<ul style="list-style-type: none"> • move to warm area • stay active • remove wet clothes and replace with dry clothes or blankets • cover the head • drink warm (not hot) sugary drink
Hypothermia Moderate (90° - 86° F) (32° - 30°C)	<ul style="list-style-type: none"> • shivering stops • unable to walk or stand • confused and irrational 	<ul style="list-style-type: none"> • All of the above, plus • Call for an ambulance • Cover all extremities completely • Place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin
Hypothermia Severe (86° - 78° F) (30° - 26°C)	<ul style="list-style-type: none"> • severe muscle stiffness • very sleepy or unconscious • ice cold skin • death 	<ul style="list-style-type: none"> • Call for an ambulance • Treat the victim very gently • Do not attempt to re-warm -- the victim should receive treatment in a hospital
Frostbite	<ul style="list-style-type: none"> • Cold, tingling, stinging or aching feeling in frostbitten area; numbness • Skin color turns red, then purple, then white or very pale skin, cold to the touch • Blisters in severe cases 	<ul style="list-style-type: none"> • Seek medical attention • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm, not hot, water
Trench Foot	<ul style="list-style-type: none"> • Tingling, itching or burning sensation • Blisters 	<ul style="list-style-type: none"> • Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm, sugary drink



WIND CHILL INDEX

Estimated wind speed	Actual temperature reading (°F/°C)											
	50/10	40/4	30/-1	20/-7	10/-12	0/-18	-10/-23	-20/-29	-30/-34	-40/-40	-50/-46	-60/-51
(mph/kph)	Equivalent wind chill temperature (°F/°C)											
0 (Calm)	50/10	40/4	30/-1	20/-7	10/-12	0/-18	-10/-23	-20/-29	-30/-34	-40/-40	-50/-46	-60/-51
5/8	48/9	37/3	27/-3	16/-9	6/-14	-5/-21	-15/-26	-26/-32	-36/-38	-47/-44	-57/-49	-68/-56
10/16	40/4	28/-2	16/-9	4/-16	-9/-23	-24/-31	-33/-36	-46/-43	-58/-50	-70/-57	-83/-64	-95/-71
15/24	36/2	22/-6	9/-13	-5/-21	-18/-28	-32/-36	-45/-43	-58/-50	-72/-58	-85/-65	-99/-73	-112/-80
20/32	32/0	18/-8	4/-16	-10/-23	-25/-32	-39/-39	-53/-47	-67/-55	-82/-63	-96/-71	-110/-79	-121/-85
25/40	30/-1	16/-9	0/-18	-15/-26	-29/-34	-44/-42	-59/-51	-74/-59	-88/-67	-104/-76	-118/-83	-133/-92
30/48	28/-2	13/-11	-2/-19	-18/-28	-33/-36	-48/-44	-63/-53	-79/-62	-94/-70	-109/-78	-125/-87	-140/-96
35/56	27/-3	11/-12	-4/-20	-20/-29	-35/-37	-51/-46	-67/-55	-82/-63	-98/-72	-113/-81	-129/-89	-145/-98
40/64	26/-3	10/-12	-6/-21	-21/-29	-37/-38	-53/-47	-69/-56	-85/-65	-100/-73	-116/-82	-132/-91	-148/-100
	LOW HAZARD Risk of exposed, dry skin being affected in less than one hour. Awareness of hazard low.				INCREASING HAZARD Danger from freezing of exposed flesh within one minute.				HIGH HAZARD Flesh may freeze within 30seconds.			

Note that wind speeds greater than 40 mph/64 kph have little additional effect.

Information in this table was originally developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA, and is further adapted from the 2004 *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, published by the ACGIH. The ACGIH publication provides the equivalent table with temperature in degrees Fahrenheit and wind speed in mph.

Equivalent wind chill temperatures identified require dry clothing to maintain core body temperature above 96.8°F (36°C).



Health, Safety and Environment
WORK / WARM-UP SCHEDULE FOR OUTSIDE WORKERS BASED ON A FOUR-HOUR SHIFT

SMS 059 NA
 Supplemental Information C
 Issue Date: February 2009

How fast a person's body cools in cold weather depends on: air temperature, wind speed, heat of the sun, and work being done. The fingers and toes usually feel cold first. Shivering then sets in. Shivering is the body's way of warning that it needs to be warm-up. |

The Work Warm-Up Schedule shows the warm-up breaks needed for work in cold conditions. It assumes that normal work practice provides for breaks in warm locations every two hours. The schedule provides for additional practice breaks as the wind velocity at the work site increases and/or the temperature drops. Warm-up breaks should begin when the temperature reaches -15° (-26° C) with winds of 10 mph (16 km/h) or greater. When the work involves riding on an unshielded vehicle or some other activity that generates wind, the number of breaks should be increases appropriately. If effective protection against the wind can be provided by shields or screens, work modifications or measures, then the work warm-up schedule for "No Noticeable Wind" would apply.

The information below applies to any four-hour period. Warm-up breaks are assumed to provide 10 minutes in a warm environment. These guidelines apply to workers wearing dry clothing.

Air Temperature - Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx.)	°F (approx.)	Max. work Period	No. of Breaks**	Max. Work Period	No. of Breaks						
-26° to -28°	-15° to -19°	(Norm breaks) 1		(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease		Non-emergency work should cease		Non-emergency work should cease					

Note: All temperatures are approximate.

Apply the schedule one step lower for work with limited physical activity. For example, at -30° F (-35° C) with no noticeable wind, a worker with a job requiring little physical movement should have a maximum work period of 40 minutes with four breaks in a four-hour period.

If reliable weather reports are not available, us the following as a guide to estimate wind velocity:

- A 5 mph (8 km/h) wind will move a light flag
- A 10 mph (16 km/h) wind will fully extend the flag
- A 15 mph (24 km/h)wind will raise a newspaper sheet
- A 20 mph (23 km/h) wind will produce blowing and drifting snow.

Source: Saskatchewan Labour Occupational Health and Safety, January 2000.

**URS SAFETY MANAGEMENT STANDARD 065
INJURY AND CLAIMS MANAGEMENT**

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

This standard is designed to ensure that employees receive appropriate, immediate, and high-quality health care services that will minimize disability, promote rapid recovery, and save lives.

3. Implementation

Implementation of this procedure is the responsibility of the manager directing activities of the facility, site, or project location.

4. Requirements

A. Injury Management

The following proactive plans and procedures will be in place before an injury or illness occurs.

1. Work Site Evaluation

Project and office locations will evaluate their location for first aid and medical requirements. The following factors should be considered:

- a. Types of accidents that could reasonably occur.
- b. Location of local clinics and hospitals.
- c. Response time for external emergency services.
- d. If corrosive or hazardous materials are in use.
- e. Any industry specific requirements.
- f. Types of training for employees and first aid responders.
- g. What first aid supplies should be available.

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

2. First Aid Services

a. First Aid Responders

There will be a sufficient number (but not less than one) of employees on each shift trained in first aid to provide adequate first response medical care available at the work site if either of these conditions exist:

- i. If life-threatening injuries can reasonably be expected, trained personnel must be available within 3 to 4 minutes. This generally means that community emergency medical services cannot be relied on since their response time is usually greater than 3 minutes.
- ii. If no life-threatening injuries can reasonably be expected, the response time for trained personnel is extended to 15 minutes.

The trained first aid responders should be designated so that the other employees know who they are and how to contact them. The trained responders must have a current first aid certificate and be trained in bloodborne pathogens (see S 051 Bloodborne Pathogens).

For certain long-term, heavily staffed, or high hazard projects, S may opt to establish a first aid station on site. It should be staffed with a person who is a nurse, emergency medical technician (EMT), or emergency medical technician-paramedic (EMT-P) who may practice limited treatment under the direction of a physician.

Where clients provide the services of a first aid station, the project manager will determine the specific services provided and the administrative procedures involved. Employees requiring first aid treatment by a client-provided facility must obtain prior approval from the project manager.

b. First Aid Kits

- i. Each site will maintain a first aid kit in accordance with Attachment 024 S Field First Aid Kit Supply List.
- ii. First aid kits will be maintained in readily accessible locations on each job site. For mobile or vehicle-based operations in remote locations, first aid kits may be necessary in vehicles.

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

- iii. Kits will be inspected prior to being sent to a work location and weekly while in use. Any items not approved for the kit will be removed during inspection.
- iv. At no time will over-the-counter medications such as antacids, aspirin, cold or cough drops, or other sundry items be stored in the kits without the written approval of the OHS Occupational Health Nurse or a OHS approved health care professional.

c. Emergency Services

The project Health, Safety, and Environment (HSE) representative, in conjunction with the project manager, will identify emergency service providers, including ambulance and hospital services. Each location will post a current list of emergency telephone numbers and maps to access local medical emergency providers (S 003 Emergency Preparedness Plans). Advance contact with ambulance services to ensure they are familiar with location, access routes, and hospital locations is advised.

d. Eyewash and Safety Shower Facilities

A corrosive material is a highly reactive substance that causes obvious damage to living tissue. Corrosives act either directly by chemically destroying the part (oxidation) or indirectly by causing inflammation. A hazardous material is any substance or compound (including corrosives) that has the capability of producing adverse effects on the health and safety of humans. Review material safety data sheets for the health effects of compounds being used at the site to determine whether they meet the criteria defined previously.

If corrosive or otherwise hazardous materials are used, eyewash and body flush facilities must be provided. Where possible, these facilities should provide large quantities of clean water. The water source must be pressure controlled and clearly identified. Portable eyewash stations must contain a minimum of 1 gallon of potable water. See Supplemental Information A for additional guidance on eyewash and shower facilities.

e. Identification of Medical Facilities

The field and office location will identify a suitable local clinic, preferably specializing in occupational medicine, to treat nonemergency injuries and illnesses. In addition, a local hospital

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

emergency room will be identified for treatment of life-threatening or after hours injuries. The URS Occupational Health Nurse, the Workers Compensation Administrator, or the workers compensation insurance carrier representative should be contacted to provide a listing of recommended medical facilities.

The project HS representative should visit the medical facility and meet with the medical provider to establish expectations. Clinics should be conveniently located, clean, professionally staffed, offer multiple services, and be supportive of early return to work practices.

Field/construction projects will make appropriate arrangements with local ambulance/emergency service providers prior to the start of work activities to ensure that appropriate transportation can be provided in the event of an emergency. These arrangements include establishment of an identifiable project address and emergency access point (i.e., location to meet emergency personnel).

The project HS representative will communicate the following with the designated hospitals/clinics:

- i. Physical requirements for each trade.
- ii. Policies regarding availability of suitable work for partially disabled employees.
- iii. Procedures for reporting of treatment diagnosis and treatment plans to the company and its workers compensation insurance carrier.
- iv. Requirements for alcohol and substance abuse testing per company and/or client required substance abuse policies (as needed).

Cost Injury Management

1. Transportation

When employees require urgent medical attention as the result of a work-related injury/illness, transportation will be provided to the doctor's office, clinic, or hospital. Employees should not be permitted to drive unless it is safe to do so.

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

2. Emergency Injury/Illness Treatment

In all cases, critical injuries must be immediately referred for professional medical attention. The manner in which the referral is accomplished, and the person responsible for the referral, should be clearly defined in either a project safety plan and/or an office emergency preparedness plan (SOS 003). Critical injuries/illnesses include, but may not be limited to, the following:

- a. Loss of consciousness.
- b. Unexplained chest pain.
- c. Breathing difficulty.
- d. Uncontrolled bleeding.
- e. Fractured bones.
- f. Suspected internal injuries.
- g. Suspected exposure to chemical/biological hazard.
- h. Second or third degree thermal or chemical burns (i.e., blistering).
- i. Electrocutation.
- j. Unexplained change in mental state following an injury (may indicate shock or other internal injuries).

3. Nonemergency Injury/Illness Treatment

When a work-related incident results in a noncritical injury/illness, the primary objective is to provide appropriate medical services to diagnose and treat the injury/illness. Options available to the employee and project/office management in these situations include the following:

- a. First aid treatment and/or review by a qualified first aid responder.
- b. First aid treatment and/or review by a qualified first aid responder followed by a referral to an occupational health clinic.

Additional support for the employee and managers in these situations can also be obtained from a SOS HS professional.

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

Attachment 065 A Injury Management Procedures Flow Chart provides a flow chart to assist employees and managers in determining the most appropriate option for obtaining medical services for nonemergency injuries/illnesses.

Note: Some states allow injured workers to choose their own initial medical provider. Employees are to be cautioned that not all medical providers accept workers' compensation insurance and coverage should be verified prior to treatment if an employee lives in a state that permits him/her to elect to see their personal doctor rather than the S recommended physician.

Workers' Compensation Case Management

1. Health and Safety

a. Occupational Health Nurse/Workers' Compensation Administrator will

- i. Evaluate and file workers' compensation claims for cases covered by the S insurance program. Evaluate and provide consultation for injuries occurring in monopolistic states (Ohio, Washington, North Dakota, and Wyoming). Energy Construction workers' compensation claims are filed by site personnel.
- ii. Provide date of injury support to employees and supervisors, including monopolistic state claims.
- iii. Coordinate regular follow-up of all cases, including monopolistic state claims, to ensure effective case management.
- iv. Offer pre-injury consultation for offices and project sites.
- v. Provide training and communication regarding the workers' compensation process.

b. The HS representatives will assist with the early return to work program by interfacing with the supervisor and employee to evaluate whether appropriate and safe temporary transitional work is available.

c. HS representatives will

- i. Provide support to ensure that the requirements of this S are in place.

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Injury and Claims Management

- ii. Provide training on this SOS.
- iii. Ensure proper reporting of incidents in accordance with SOS 04 Injury/Illness/Incident Reporting and Notification.
- iv. Ensure that requirements of this SOS are incorporated into all project health and safety plans.

2. Human Resources

The HR representatives will forward any external communication (e.g., clinic bills, monopolistic state forms) to the Occupational Health Nurse or Workers Compensation Administrator upon receipt.

3. Supervisor

The Supervisor (or HR or HS representative) will

- a. Sign the Medical Treatment Referral form (Attachment 065.2 A) prior to the employee leaving the site for medical treatment (this will not be necessary in an emergency). The employee will also be given the Medical Authorization Form (Attachment 065.3 A) to be signed with copy provided to the employee, health care provider, and Occupational Health Nurse or Workers Compensation Administrator.
- b. Provide transitional job assignments, with consultation and approval of the office manager, whenever possible to enable an injured worker to return to work (Return to Work Policy Attachment 065.4 A).
Transitional employment is defined as temporary modified or light duty work that covers the time from the injury until the release to full duty from the doctor. The return to work hierarchy includes the following:
 - i. Return to own job.
 - ii. Return to own job with accommodations/modifications.
 - iii. Return to another job at SOS with or without accommodations/modifications.
 - iv. Placement in alternate jobs through telecommuting or other job assignments determined case by case.
- c. Provide, when requested by the treating physician or insurance carrier, the Description of Employee's Job Duties form (Attachment 065.5 A).

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

- d. Maintain regular contact with employees who are temporarily disabled (contact at least weekly by phone or email).
4. Employee
 - The employees will
 - a. Report injuries immediately to their supervisors. Employees are encouraged to contact their supervisor and/or the Occupational Health Nurse or Workers Compensation Administrator prior to seeking any medical services for nonemergency injuries and illnesses.
 - b. Review and comply with Attachment 065.6 Employee Responsibilities.
- URS will follow the recordability requirements of U.S. Occupational Safety and Health Administration (OSHA) (29 CFR 1904 and 1952) for both U.S. and international operations.
1. For Infrastructure Environment and Federal Services, the Occupational Health Nurse will maintain OSHA 300 logs for U.S. locations. For Energy Construction, the Business Group HS Managers will maintain OSHA 300 logs for U.S. locations. The OSHA 300 logs (with employee names deleted) will be distributed to the U.S. locations each January. Logs will be posted from February 1 to April 30 in a location conspicuous to all employees. The posted log must not be altered, defaced, or covered by any other materials.
 2. Sites working under the U.S. Mine Safety and Health Administration (MSHA) recordkeeping requirements will meet MSHA requirements, as well as track injuries using OSHA criteria for use in company HS statistics.
 3. For Infrastructure Environment and Federal Services, the Occupational Health Nurse will make the initial decision on recordability of an injury/illness. For Energy Construction, the Business Group HS Manager will make the decision on recordability of an injury/illness.
 4. For Infrastructure Environment, a recordability review committee will be appointed by the Vice President HS to review the recordable cases on a monthly basis. The review committee (based on OSHA regulations and information regarding the case) will make the final decision on recordability.

URS SAFETY MANAGEMENT STANDARD

Injury and Claims Management

5. The injury/illness statistics (e.g., total recordable incident rate) will be calculated monthly and reported to OHS management.
6. Completed logs of recordable cases, including any regulatory required forms (OSHA 300 logs, incident report forms, etc.) will be retained at least five years following the end of the calendar year these records cover.

5. Documentation

A. The following documents will be maintained in the office/project safety file:

1. Posting of medical services providers and emergency phone numbers.
 2. List of qualified first aid providers.
 3. Documentation of coordination between OHS and emergency service providers for field/construction projects.
 4. Completed injury/illness/incident report form (Attachment 0401).
 5. Description of employee's Job Duties form.
 6. Medical treatment referral form.
 7. Medical Authorization form.
- B. The following documents will be maintained by the HSE representative and copied to the Occupational Health Nurse or Workers' Compensation Administrator.
1. Physician's first report of injury and follow-up reports.
 2. Medical treatment referral form.
 3. Medical Authorization form.
 4. Description of employee's Job Duties form.

6. Resources

- A. U.S. Occupational Safety and Health Administration (OSHA) [29 Code of Federal Regulations \(CFR\) 1910.151](#) Medical Services and First Aid
- B. [OSHA 29 CFR 1910.1030](#) Bloodborne Pathogens
- C. [OSHA 29 CFR 1926.50](#) Medical Services and First Aid

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- . [OSHA 29 CFR 1904](#) Recording and Reporting Occupational Injuries and Illnesses
- . [OSHA 29 CFR 1952](#) Approved State Plans for Enforcement of State Standards
- . American National Standards Institute ([ANSI](#)) [Z358.1-2004](#) Emergency Eyewash and Shower Equipment
- . [OSHA Instruction OSHA-2005-2.53](#) Guidelines for First Aid Programs
- H. [OSHA Safety and Health Topics: Medical and First Aid](#)
- . Red Cross Health and Safety Services www.redcross.org/services/hss/
- J. [SOS 003](#) Emergency Preparedness Plans
- . [SOS 024](#) Medical Screening and Surveillance
- L. [SOS 04](#) Injury/Illness/Incident Reporting and Notifications
- . [SOS 051](#) Bloodborne Pathogens
- . Medical Services Provider WorkCare™ 1-800-455-6155

O. Contacts

Infrastructure & Environment	Federal Services	Energy & Construction
Occupational Health Nurse	Senior Occupational Health Nurse	Workers Compensation Administrator
Jeanette Schrimsher, RN COHN-S (866) 326-321 (Toll Free U.S.) (512) 656-0203 (Cell) (512) 416-6413 (Confidential Fax)	BJ (Johnston) Heinrich, RN, BSN, COHN-S (800) 888-525 (Toll Free) (512) 656-8502 (Cell) (512) 416-5252 (Confidential Fax)	Terry Sower, CPCU, AIC, CWCP (208) 386-6038 (Office) (208) 800-3843 (Cell) (208) 386-5462 (Confidential Fax)

- . [Attachment 065.1 A](#) Injury Management Procedures Flow Chart
- . [Attachment 065.2 A](#) Medical Treatment Referral Form
- . [Attachment 065.3 A](#) Medical Authorization Form
- S. [Attachment 065.4 A](#) Return to Work Policy
- . [Attachment 065.5 A](#) Description of Employee's Job Duties

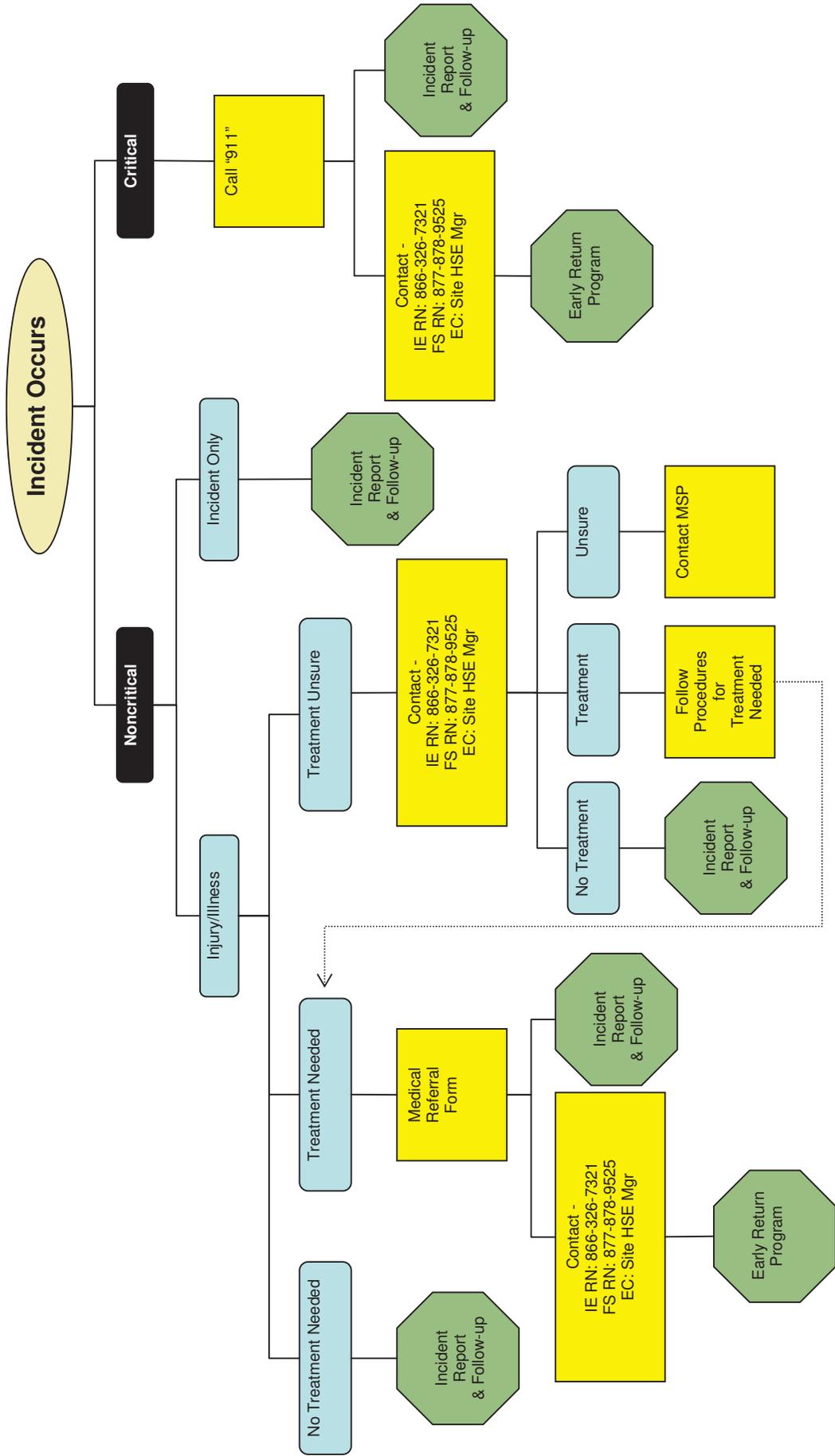
URS SAFETY MANAGEMENT STANDARD

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- . [Attachment 06506 A](#) □ □mployee's □esponsibilities
- . [Attachment 06500 A](#) □ □njury □anagement □hecklist

7. Supplemental Information

- A. [□mergency □eyewash and Shower □quipment](#)





Health, Safety, and Environment
MEDICAL TREATMENT REFERRAL

Attachment 065-2 NA

Issue Date: January 2003
Revision 5: January 2011

Date _____ Site Phone Number _____

URS Site Contact _____

Employee Name _____ Social Security # _____

Employee Signature _____

Brief Job Description _____

Date of Injury _____ Body Part Injured _____

Place of Injury _____

Post-accident drug and/or alcohol test required? Yes No

Medical Provider:

Name _____ Phone _____

Address _____

Employee Transported to Medical Provider by: _____

**Workers' Compensation
Claims Administrator:**

Sedgwick CMS (see attached billing locations)
(except for: Washington, Ohio, North Dakota, Wyoming)

For questions, please contact:

Infrastructure & Environment	Jeanette Schrimsher, RN	(866) 326-7321
Federal Services	BJ (Johnston) Heinrich, RN	(877) 878-9525
Energy & Construction	Terry Sower	(208) 386-6038

Early Return-to-Work and Transitional Employment Policy

To Medical Providers: URS Corporation values its employees and believes that it is helpful to an injured worker's recovery to return to work as soon as medically approved. Please contact us if you have any questions regarding releasing the employee to work either in a modified/light duty status or full duty clearance. Please send a work status report to the site contact listed above following the initial medical evaluation and each follow-up appointment.

Supervisor Name

Supervisor Signature



Providers: Send medical bills to Sedgwick CMS at the office address indicated for the state where the claim is filed.

URS Corporation & Sedgwick Claims Management Services, Inc.

Workers' Compensation Claims Handling Offices

Albuquerque, NM	Anchorage, AK	Baltimore, MD	Boise, ID
<p><u>States Served</u></p> <p>New Mexico</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14489 Lexington, KY 40512-4489 Toll-Free: 800-255-4349 Tel: 800-255-4349 Fax: 505-256-1412</p>	<p><u>States Served</u></p> <p>Alaska</p> <p><u>Office Information</u> Sedgwick CMS PO Box 14518 Lexington, KY 40512-4518 Toll-Free: 866-853-0048 Tel: 907-868-2787 Fax: 907-868-3042</p>	<p><u>States Served</u></p> <p>DC, DE, MD, PA</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14491 Lexington, KY 40512-4491 Toll-Free: 800.285.3258 Tel: 410-773-4200 Fax: 410-773-4221</p>	<p><u>States Served</u></p> <p>Idaho</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14543 Lexington, KY 40512-4543 Toll-Free: 866-253-1074 Tel: 208-385-5523 Fax: 208-385-5586</p>
Charleston, WV	Columbia, SC	Dallas, TX	Denver, CO
<p><u>States Served</u></p> <p>West Virginia</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14480 Lexington, KY 40512-4480 Toll-Free: 877-393-0022 Tel: 304-347-9600 Fax: 304-347-9610</p>	<p><u>States Served</u></p> <p>AL, GA, KY, MS NC, SC, TN, VA</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14480 Lexington, KY 40512-4480 Toll-Free: 800-426-9218 Tel: 803-551-2100 Fax: 803-750-2885</p>	<p><u>States Served</u></p> <p>Louisiana Oklahoma Texas</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14497 Lexington, KY 40512-4497 Toll-Free: 888-899-4694 Tel: 214-849-5000 Fax: 214-849-5201</p>	<p><u>States Served</u></p> <p>Arizona Colorado</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14493 Lexington, KY 40512-4493 Toll-Free: 800-507-9656 Tel: 303-713-6000 Fax: 303-713-6056</p>
Freeport, ME	Helena, MT	Honolulu, HI	Las Vegas, NV
<p><u>States Served</u></p> <p>CT, MA, ME NH, RI, VT</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14492 Lexington, KY 40512-4492 Toll-Free: 800-526-3721 Tel: 207-865-2568 Fax: 207-865-2599</p>	<p><u>States Served</u></p> <p>Montana</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14544 Lexington, KY 40512-4544 Toll-Free: 866-458-4737 Tel: 406-442-2202 Fax: 406-442-2865</p>	<p><u>States Served</u></p> <p>Hawaii</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14541 Lexington, KY 40512-4541 Tel: 808-523-3200 Fax: 808-523-3250</p>	<p><u>States Served</u></p> <p>Nevada</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14483 Lexington, KY 40512-4483 Toll-Free: 888-713-1112 Tel: 702-568-3800 Fax: 702-240-1962</p>
Memphis, TN	Omaha, NE	Portland, OR	Rochester, NY
<p><u>States Served</u></p> <p>Arkansas</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14423 Lexington, KY 40512-4423 Toll-Free: 866-856-4805 Tel: 901-566-3300 Fax: 901-566-3415</p>	<p><u>States Served</u></p> <p>IA, IL, IN, KS MI, MN, MO NE, SD, WI</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14513 Lexington, KY 40512-4513 Toll-Free: 800-486-2152 Tel: 402-496-2000 Fax: 402-496-6511</p>	<p><u>States Served</u></p> <p>Oregon</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14514 Lexington, KY 40512-4514 Toll-Free: 800-906-3147 Tel: 503-412-3948 Fax: 503-412-3990</p>	<p><u>States Served</u></p> <p>New Jersey New York</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14515 Lexington, KY 40512-4515 Toll-Free: 866-846-7757 Tel: 585-368-7700 Fax: 585-368-7710</p>
Roseville, CA	Salt Lake City, UT	Tampa, FL	
<p><u>States Served</u></p> <p>California</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14433 Lexington, KY 40512-4433 Toll-Free: 866-274-6586 Tel: 916-771-2900 Fax: 916-771-2990</p>	<p><u>States Served</u></p> <p>Utah</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14485 Lexington, KY 40512-4485 Toll-Free: 866-814-8220 Tel: 801-258-9700 Fax: 801-258-9730</p>	<p><u>States Served</u></p> <p>Florida</p> <p><u>Office Information</u> Sedgwick CMS P.O. Box 14437 Lexington, KY 40512-4437 Toll-Free: 888-390-9522 Tel: 813-287-4100 Fax: 813-282-6783</p>	



Health, Safety, and Environment
MEDICAL AUTHORIZATION FORM

Attachment 065-3 NA
Issue Date: January 2003
Revision 5: January 2011

**WORKERS' COMPENSATION
EMPLOYEE AUTHORIZATION LETTER**

To Whom It May Concern:

I, _____, hereby authorize any hospital,
Please Print Name
medical practitioner, clinic, other medical or medically related facility, pharmacy,
or insurance company to furnish to URS Corporation or its subsidiaries or
representatives (orally or in writing) information with respect to any work-related
injury or illness, including treatments, consultations, prescriptions, and copies of
applicable records that may be requested. I also authorize my employer to
disclose information needed to process my workers' compensation claim.

The information provided to URS Corporation, its subsidiaries, or representatives
is to be used solely for the administration of my workers' compensation claim.

A photocopy of this authorization is to be considered as valid as the original and
is effective for the duration of the claim.

Signature: _____ Date: _____

- Signed copies to: Employee
 Medical Provider
 URS Occupational Health Nurse/Workers' Compensation Administrator



Health, Safety, and Environment
RETURN TO WORK POLICY

Attachment 065-4 NA

Issue Date: January 2003
Revision 5: January 2011

Our primary goal in safety is the prevention of work-related injuries. When an injury does occur, it is the policy of URS to provide our employees with the best possible recovery program. A major component of any successful recovery program is returning the injured employee to the workforce as soon as medically possible. This type of Early Return Strategy has been shown to dramatically reduce the overall recovery time of injured workers, creating a benefit for the employee, his/her family, coworkers, and the firm.

As part of this policy, Operations; Human Resources; Health, Safety, and Environment; and our workers' compensation insurance carrier will work together with our employees and their treating physician to establish a recovery program that minimizes both the number of cases and total days away from work experienced by our employees. URS operations will accommodate transitional work (i.e., light duty or modified work) requirements for employees recovering from work related injuries, whenever possible. The work limits, as defined by the treating physician, will be strictly adhered to. Modified job assignments will be structured to meet the capacities and therapy needs of the injured employee.



Health, Safety and Environment
DESCRIPTION OF EMPLOYEE'S JOB DUTIES

Attachment 065-5 NA

Issue Date: January 2003
Revision 5: January 2011

Print Name: _____

Location: _____ Phone: _____

Job Title: _____ No. Hours/Day: _____ No. Days/Week: _____

General Job Description: _____

1. Check the frequency and number of hours a day the activity is performed:

Activity	Frequency		Number of Hours Per Day										
	Continuous	Intermittent	0	1	2	3	4	5	6	7	8	9+	
Sitting	<input type="checkbox"/>												
Walking	<input type="checkbox"/>												
Standing	<input type="checkbox"/>												
Bending	<input type="checkbox"/>												
Squatting	<input type="checkbox"/>												
Climbing	<input type="checkbox"/>												
Kneeling	<input type="checkbox"/>												
Twisting	<input type="checkbox"/>												

2. Hand manipulation required? (If yes, complete 2 a, b, c, d) Yes No

2a. Simple grasping? Yes No Right Left

2b. Power grasping? Yes No Right Left

2c. Pushing and pulling? Yes No Right Left

2d. Fine manipulation? Yes No Right Left

3. Does the job require reaching at or above shoulder level? Yes No

4. Does the job require use of the feet to operate foot controls? Yes No

5. Are there special visual requirements? (Describe) Yes No

6. Are there special hearing requirements? (Describe) Yes No

7. Lifting and carrying (check weight lifted, frequency, and how far carried):

Weight	Frequency			Distance Carried
	Hourly	Daily	Weekly	
1-10 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11-25 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
26-40 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
41-60 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
61-75 lbs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

8. Environmental conditions (check yes or no):

- 8a. Work near dust, gas, vapors, or fumes? Yes No
- 8b. Work in noisy environment? Yes No
- 8c. Work in extremely hot temperature? Yes No
- 8d. Work in extremely cold temperature? Yes No
- 8e. Work at heights? Yes No
- 8f. Walk on uneven surfaces? Yes No

9. Equipment operated (check yes or no):

- 9a. Computer and mouse? If yes, hours per day _____ Yes No
- 9b. Drive car, truck, or van? Yes No
- 9c. Operate forklift or heavy equipment? Yes No
- 9d. Other (please describe):

10. Comments:

Employee Signature: _____ Date of Hire: _____

Date: _____

If an employee is injured at work or becomes ill due to a work-related issue, the employee must abide by the following:

1. Employee shall immediately notify their supervisor and HSE representative, even if the employee does not believe that they need medical attention.
2. With the assistance of their supervisor, the employee shall complete SMS 049-1 (in all cases), and SMS 065-3 (Medical Treatment Referral form) if medical attention is needed.
3. If it is perceived that medical attention is needed, an employee will be provided an opportunity for a telephonic consultation with the Occupational Health Nurse (OHN). During that consultation, if it is determined that an employee will need a physician evaluation, the OHN will contact the clinic with the necessary workers' compensation billing information. Unless it is an emergency, all employees are required to obtain approval from their supervisor and OHN. This ensures that URS, the workers' compensation carrier and the clinic are notified appropriately and timely medical treatment can be provided and follow-up given.
4. Provide the Medical Treatment Referral form to the treating physician. If employees are unable to obtain the form prior to being treated (i.e., onset of symptoms during non-work hours, work in remote locations), they must notify their supervisor as soon as possible on the next scheduled workday.
5. If an employee is treated by a physician, the employee is required to inquire if a consent form will need to be signed by the employee in order for medical records to be released to the URS Occupational Health Team. (Some clinics do not accept form SMS 065-3.) The employee will also need a work status form from the physician indicating if the employee can return to work, has restrictions or must be off work.
6. This work status form must be given to the employee's supervisor and/or HSE representative **and** emailed or faxed to URS Occupational Health Team immediately after the physician visit. Contact information for the URS Occupational Health Team is presented below.

Infrastructure & Environment	Federal Services	Energy & Construction
Occupational Health Nurse	Senior Occupational Health Nurse	Workers' Compensation Administrator
Jeanette Schrimsher, RN COHN-S	BJ (Johnston) Heinrich, RN, BSN, COHN-S	Terry Sower, CPCU, AIC, CWCP
Toll-Free U.S.: (866) 326-7321	Toll Free: (877) 878-9525	Office: (208) 386-6038
Cell: (512) 656-0203	Cell: (512) 656-8502	Cell: (208) 890-3843
Confidential Fax: (512) 419-6413	Confidential Fax: (512) 419-5252	Confidential Fax: (208) 386-5462
Email: jeanette_schrimsher@urscorp.com	Email: bj_heinrich@urscorp.com	Email: terry.sower@wgint.com

- a. If a physician has indicated that a follow-up appointment is needed or the employee will need to schedule future follow-up appointments, the employee is required to attend the appointment regardless if the employee is feeling better or having no symptoms. There is a reason the physician felt like he/she needed to see the employee for that follow-up visit, and the visit is required to ensure proper recovery.
 - b. If an employee has been put on restrictions or is taken off work, once the employee is cleared to return to work the employee must receive a return to work without restrictions release from the physician. This updated work status report must be given to the employee's supervisor and/or HSE representative immediately. URS cannot return an employee to work without this release.
7. After every medical provider visit (whether the employee is off work/restricted work or is just having a follow-up) the employee is required to contact the URS Occupational Health Team. The employee shall provide an update as to the medical provider visit, plan of care, to ensure that the employee is getting the appropriate care in a timely manner, and to ensure that the physician is being reimbursed accordingly. The employee must also contact their supervisor and/or HSE representative to inform him/her of their work status.
 8. Once the initial information of the employee's injury/illness is received by the URS workers' compensation insurance carrier.
 9. It is likely that the employee will be contacted by the workers' compensation carrier either by letter and/or by phone.
 10. The claims adjuster, telephonic nurse case manager and/or field case manager may ask that the employee to communicate with them after every medical provider appointment as well. This would be in addition to the employee contacting the URS Occupational Health Team.

Off-Work or Restricted Work

It is URS' goal to return an employee back to work as quickly as possible to decrease an employee's healing time (as supported by medical studies that earlier return to work decreases complications), promote wellness, provide support to an employee during the recovery time, and to return the employee to full wage-earning capacity.

1. If an employee is placed off work by a physician for either personal medical reasons or work-related medical reasons, the employee is required to notify Human Resources, their supervisor, HSE representative and the URS Occupational Health Team. Human Resources may have additional requirements. For extended absences, an employee will want to discuss with Human Resources the necessary steps that an employee will need to take to maintain benefits that an employee has signed up for in active status (e.g., insurance premiums for personal medical insurance, short term disability, etc.).

2. For work-related incidents, once the workers' compensation carrier has determined that the case is accepted as a claim, the employee will begin receiving workers' compensation payments. The payments will be paid at approximately 66.67% of the employee's base pay.
3. If an employee must be off work or is given restricted work for injury or illness of any kind, the employee is required to notify their supervisor immediately.
4. If an employee is absent for more than 3 days for personal illness or injury, an employee may be required to provide a physician note indicating the employee's work status and release to return to work. This will need to be provided to Human Resources and the employee's supervisor. For work-related illness or injury a physician's note is required for any absence due to an incident.

Before an Injury

- € Identify emergency care service providers.
- € Identify clinic for non-emergency medical care – Occupational Health physicians (give preference to Board-Certified).
- € Post instructions for reporting injuries, medical providers, contact info, and driving directions on safety bulletin board(s).
- € Develop a bank of light-duty positions with descriptions that would accommodate different levels of restrictions.
- € Develop a relationship with the physician and clinic staff (especially Office Manager):
 - Philosophy – most effective treatment, minimize OSHA recordability, minimize impact to employee, light duty always available
 - Visit clinic often to maintain relationship (quarterly)
 - Invite physician to visit site and work areas
 - Provide copies of light-duty position descriptions.
- € Implement first aid treatment program – designate/train first aid responders, keep first aid supplies readily available, etc.
- € Identify who will be responsible for contacting any employees with lost work days.
- € Train employees on program requirements:
 - Immediate reporting as a company mandate
 - Potential delay of treatment for late reporting
 - First aid treatment
 - Advantage for using Company physicians
 - Potential benefit loss and disciplinary action for unauthorized non-emergency treatment
 - Waiting periods for workers' compensation benefits.

When an injury occurs

- € CALL 911 (or equivalent) if this is an emergency situation.
- € Provide first aid treatment (e.g., ice, over-the-counter ibuprofen, bandages, a place to rest).
- € Initiate an immediate investigation to ensure work-related written reports (employee and witnesses); review for red flags.
- € Notify the Occupational Health Department (OHD) before non-emergency medical care; do not take to a clinic unless medically necessary.
- € Influence (or control, depending on state law) choice of treating physician.
- € Escort injured employee to and remain through medical treatment.
- € Remind clinic personnel of transitional duty and OSHA-recordable sensitive treatment.
- € Remind injured worker of transitional-duty benefits – part of the team, receive full pay, save their personal leave time.
- € Notify HSE chain-of-command and follow site communication protocol.
- € Coordinate post-incident drug and alcohol screen.
- € Review return-to-work slip before departing facility. Review restrictions; if unreasonable or unclear, discuss with clinic. Seek alternative solutions to lost time if medically feasible.
- € Accommodate any restrictions.
- € Obtain a second opinion if initial provider's diagnosis (especially lost time) is unreasonable; work closely with OHD
- € Require a return-to-work slip following **all** medical visits and provide a copy to the OHD.
- € Ensure the employee makes any follow-up visits or referrals to another provider – need to ensure to close the loop on workers' compensation claims.
- € Maintain regular and personal contact with the employee:
 - Ensure he/she shows up for work the next day
 - If on restrictions, visit regularly to ensure working within restrictions
 - If on lost time, call on a regular basis to check status (minimum weekly).

A. Eyewash Equipment

Plumbed and self-contained eyewash units will meet the following specifications:

1. A controlled flow of flushing liquid will be provided to both eyes simultaneously at a velocity low enough so as to not cause injury to the user.
2. Spray nozzles will be protected from airborne contaminants. The removal of such protection during operation will not require a separate motion by the operator when activating the unit.
3. The eyewash will be designed and installed in such a manner that, once activated, it will not require the use of the operator's hands. The valve controlling the flow from the eyewash will remain open until it is intentionally closed.
4. Units will be constructed in such a manner that they will not corrode in the presence of the flushing fluid.
5. Stored flushing fluids will be protected against airborne contaminants.
6. Eyewash equipment will be capable of delivering flushing fluid to the eyes at a rate of not less than 0.4 gallons per minute (gpm), or 1.5 liters per minute (lpm), for 15 minutes.
7. The unit will be designed to provide sufficient room to allow the eyelids to be held open with the hands while the eyes are in the flushing stream.
8. The valve to open the eyewash flow will be simple to operate and will go from OFF to ON in 1 second or less.
9. The eyewash unit will be assembled and installed in accordance with the manufacturer's instructions.
10. The unit will be in an accessible location that requires no more than 10 seconds to reach. It will be on the same level as the hazard and the path of travel will be free of obstructions. For strong caustics or acids, the eyewash should be immediately adjacent to the hazard.
11. The unit will be located in an area identified with a highly visible sign positioned so that the sign will be visible within the area served by the eyewash. The area around the eyewash will be well lit.
12. The eyewash will deliver tepid flushing fluid.
13. Where the possibility of freezing conditions exists, equipment will be protected from freezing or freeze-protected equipment will be installed.

14. Plumbed eyewash equipment will be activated weekly to verify operation and ensure that flushing fluid is available. Self-contained eyewash equipment will be visually checked regularly to determine whether the flushing fluid needs to be changed or supplemented.
15. All eyewash units will be inspected annually for compliance with the requirements listed in this document.
16. Employees who may be exposed to hazardous materials will be instructed in the location and proper use of emergency eyewash units.

□. Shower Equipment

Plumbed and self-contained shower units will meet the following specifications:

1. A controlled flow of flushing liquid will be provided to both eyes simultaneously at a velocity low enough so as to not cause injury to the user.
2. The shower will be designed and installed in such a manner that, once activated, it will not require the use of the operator's hands. The valve controlling the flow from the eyewash will remain open until it is intentionally closed.
3. Units will be constructed in such a manner that they will not corrode in the presence of the flushing fluid.
4. Stored flushing fluids will be protected against airborne contaminants.
5. Shower equipment will be capable of delivering flushing fluid at a rate of not less than 20 gpm (75.7lpm) for 15 minutes.
6. The valve to open the eyewash flow will be simple to operate and will go from OFF to ON in 1 second or less.
7. The eyewash unit will be assembled and installed in accordance with the manufacturer's instructions.
8. The unit will be in an accessible location that requires no more than 10 seconds to reach. It will be on the same level as the hazard, and the path of travel will be free of obstructions.
9. The unit will be located in an area identified with a highly visible sign positioned so that the sign will be visible within the area served by the shower. The area around the eyewash will be well lit.
10. The shower will deliver tepid flushing fluid.
11. Where the possibility of freezing conditions exists, equipment will be protected from freezing or freeze-protected equipment will be installed.

12. Plumbed shower equipment will be activated weekly to verify operation and ensure that flushing fluid is available. Self-contained shower equipment will be visually checked regularly to determine whether the flushing fluid needs to be changed or supplemented.
13. All eyewash units will be inspected annually for compliance with the requirements listed in this document.
14. Employees who may be exposed to hazardous materials will be instructed in the location and proper use of emergency eyewash units.

C. Eye/Face Wash Equipment

Eye/Face wash equipment will meet all the criteria outlined in Section A, except the equipment will be capable of delivering flushing fluid at a rate of not less than 3.0 gpm (11.4 lpm) for 15 minutes.

D. Combination Units

Combination units (eyewash and shower assemblies served by a single source of flushing fluid) will meet all the criteria outlined in Section A.

URS SAFETY MANAGEMENT STANDARD 069
MANUAL MATERIAL HANDLING

URS SAFETY MANAGEMENT STANDARD

Manual Material Handling

1. Applicability

This standard applies to URS Corporation and its subsidiary companies where personnel perform manual handling of materials. For this procedure, manual material handling (MMH) is defined as the movement of items by lifting, lowering, pushing, pulling, carrying, holding, or restraining.

2. Purpose and Scope

The purpose of this standard is to prevent common injuries caused by the practice of MMH. Immediate or short-term effects include lacerations, bruises, and muscle fatigue. Long-term effects include chronic pain, frequently in the lower back but also in limb joints and ligaments.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project.

4. Requirements

A. General

1. Prior to lifting, lowering, pushing, pulling, carrying, holding, or restraining an object of any significant size or weight, employees must evaluate the object and the required task to determine whether they can handle the object safely.
2. If the employee has any doubt about whether he or she can safely move the object alone, the employee should obtain additional manual or mechanical help.
3. Healthy employees with no physician-imposed restrictions should be able to lift and carry a maximum of 50 pounds (23 kilograms) using proper lifting and carrying techniques. Physical and workplace factors may reduce this recommended weight limit (RWL) significantly and should be considered prior to attempting lifts of this magnitude. Examples of physical and workplace factors may include the following:
 - a. Physical size of an object.
 - b. Slippery container surface or poor grip ability.
 - c. Sharp edges.
 - d. Slippery floors or obstacles on the floor.
 - e. Cold or hot objects surfaces.
 - f. Distance and route of travel.

URS SAFETY MANAGEMENT STANDARD Manual Material Handling

4. An employee's personal "safe" MM capability is defined as the employee's personal capability to manually lift, carry, push, or pull an object alone. This "safe" limit must consider the employee's past experience and training with MM, health status, and any other personal or environmental characteristics affecting the employee's ability to perform these tasks. An employee's "safe" MM capability is typically at or below the calculated RW. In some cases, a trained and physically conditioned employee may exceed the MM capability limit, but only after a complete hazard review of the task has determined an acceptable risk for minimizing injury.
 5. An MM task that exceeds an employee's personal "safe" MM capability or RW should be brought to the attention of the applicable manager or safety supervisor for the project.
 6. If, due to a medical or health condition, the employee's physician or the employee has set a personal "safe" MM capability, then appropriate medical documentation must be provided to the applicable manager to define these limits. The manager and appropriate safety supervisor should evaluate the tasks to which that employee is assigned and recommend a specific course of action to limit the potential for injury. This should include periodic monitoring of the employee and his/her work environment.
 7. A recommended RW can be calculated using the factors described in Supplemental Information A. The weight limit derived from these calculations is considered to be a load that over 99% of men and over 75% of women can safely handle without application of engineering or administrative controls. **Implementation of the calculations in Supplemental Information A should be attempted only with the assistance of a safety professional knowledgeable in the application of these factors. The calculations are intended to determine RWs for repetitive lifting scenarios rather than occasional lifts.**
 8. Prior to any manual lift, it is suggested that the employee warm up his or her muscles and joints using a combination of stretching and flexing.
- . Preplanning
1. Where MM will be a necessary function of the task, the manager and/or safety supervisor should perform a thorough evaluation of the activities to determine ergonomic solutions to reduce or eliminate conditions that can cause or contribute to MM injuries.

URS SAFETY MANAGEMENT STANDARD **Manual Material Handling**

2. If a heavy object is to be moved to another location, the safest transport route should be determined prior to the activity.
 3. The area around the object and the route over which it will be transported should be checked for slip, trip, and fall hazards. Hazards should be removed prior to initiation of the task.
 4. The object to be moved should be inspected for grasping or handling hazards, such as splinters, sharp edges, grease, water, etc. Eliminate or abate any identified hazards where possible. Safe grasping or handling points on the object should be determined. Whenever possible, containers with carrying handles should be used for objects because they increase the manual grip strength for holding the object, thus providing better control and reduced muscle fatigue.
 5. The distance to be traveled and the length of time that a grip on the object must be maintained should be considered before moving objects. If the travel distance is greater than 10 feet (3 meters) at maximum RW, the employee should consider using an alternative method, rather than manually carrying the object.
6. Lifting/Lowering Guidelines
1. Reduce or eliminate manual lifting and lowering tasks where possible. Determine whether there are ways to abate the safety and ergonomic hazards associated with manual lifting.
 2. The recommended technique for two-handed manual lifting/lowering involves five maneuvers:
 - a. Get a firm footing. Keep your feet apart for a stable base. Put one foot slightly in front of the other.
 - b. Bend your knees. Do not bend at the waist. When grasping the object, a firm grip should be obtained before lifting/lowering.
 - c. Lift/lower with your legs. Lift/lower the load slowly and in a straight line, avoiding sudden movements.
 - d. Keep the load close to the body. Generally, the closer the load is to the body, the less force it exerts on your back.
 - e. Keep your back straight, your head and shoulders up, and your stomach muscles tight. Do not add the weight of your body to the load. Avoid twisting.

URS SAFETY MANAGEMENT STANDARD **Manual Material Handling**

3. When a turn or change of direction is necessary, the object should be lifted or lowered into a carrying position, then the whole body should be turned with the feet, avoiding any trunk twisting motion.
4. Objects to be lifted to shoulder height should first be lifted to waist height, then rested on a level surface so the grasping position can be changed prior to lifting to a higher level.
5. Employees should never lift a load above their head.

D. Carrying/Holding Guidelines

1. Manual carrying is an inefficient way of transporting materials in the workplace. Where possible, reduce or eliminate manual carrying tasks.
2. Never carry a load above the head.
3. Carry an object close to the body using both hands. One-handed carries are awkward and tend to unbalance the employee.
4. Do not carry objects that are so large they will obstruct visibility.
5. Do not change grips on an object while carrying or holding an object. Rest the object on a secure surface prior to changing grip.
6. If an object is of a size, shape, or mass that it requires two people to carry, use two people of similar size and physique. Two-person lifts should be planned and coordinated before performing the lift. Lift the item in unison.
7. Avoid carrying objects on stairs, particularly where the line of sight may be obstructed or the object can interfere with leg movement. All travel on stairs requires use of a handrail at all times, so only carry objects that can be safely handled with one hand. Always maintain handrail contact when carrying an object up or down stairs.

E. Pushing/Pulling Guidelines

1. Check the condition of the floor, ground, or other surface prior to pushing or pulling an object across it.
2. Be aware of the break-out force of the object—this is the force at which a push or pull overcomes the frictional force between the surface and object. Adjust posture to avoid losing balance when this point is reached.
3. Get assistance when moving or guiding a large load.
4. Where possible, always push rather than pull a load.

URS SAFETY MANAGEMENT STANDARD **Manual Material Handling**

5. Never load the cart or load-carrying device in such a manner that visibility is obstructed in the path of travel.
6. When pushing or pulling an object on an inclined surface, be certain that you can control the load and direction of travel before proceeding. Obtain additional support to control the load if necessary.
7. Never leave carts or loads in an area that will present a hazard to other workers. Make sure carts or transport devices are secured in position before leaving them unattended.

F. Workplace Design

1. Store heavy or bulky materials at heights between the knee and shoulder to avoid the need to stretch or bend. Use step stools to access objects above shoulder height.
2. Pack or arrange items to be lifted to avoid shifting of weight in the package. If a box has hand cutouts (e.g., file archive boxes) do not load the box so full that the handles cannot be used for carrying the box.
3. Design work areas to avoid the need to lift, carry, push, or pull heavy or bulky materials for extended distances.
4. Design workplaces with the following in mind:
 - a. Lifts from the floor should be avoided.
 - b. The torso should never twist while handling loads.
 - c. Asymmetrical or unbalanced one-handed lifts should be avoided.
 - d. Loads should not be lifted with sudden movements.
 - e. Loads should not be lifted over obstacles.
 - f. Loads should not be lifted at extended forward or sideways reaches.
 - g. Uncomfortable or static postures should not be necessary throughout the work cycle.
 - h. Environmental factors (e.g., task lighting, dry work surfaces, heat or cold stress) should be considered.

G. Training

1. Personnel who may have MMH as part of their duties are required to receive training that includes the following topics:

URS SAFETY MANAGEMENT STANDARD **Manual Material Handling**

- a. Showing personnel how to avoid unnecessary physical stress and strain during MMH operations.
 - b. Teaching personnel to become aware of what they can comfortably handle without undue strain.
 - c. Instructing personnel on the proper use of equipment.
 - d. Teaching personnel to recognize potential hazards and how to prevent or correct them.
2. This training must be completed prior to an employee being assigned to a task that involves MMH activities.
 3. Assistance with training or training materials is available through the HSE staff.

Documentation Summary

The following documentation will be maintained in the project file:

- A. Training rosters.
 - . Other proof of completion of MMH training.

Resources

- A. National Institute for Occupational Safety and Health (NIOSH) Work Practices Guide for Manual Lifting <http://www.cdc.gov/niosh>
- . Canadian Centre for Occupational Health and Safety <http://www.ccohs.ca/oshanswers/ergonomics/>
- . Oregon OSHA Ergonomics of Manual Materials Handling <http://www.cbs.state.or.us/external/oshapdf/workshops/206w.pdf>
- D. North Carolina Department of Labor OSHA Guide to Manual Materials Handling and Back Safety <http://www.nclabor.com/oshasetta/indguide/ig26.pdf>

Supplemental Information

- A. [Recommended Weight Limit \(RWL\) Calculations](#)

This lifting equation, developed by the National Institute for Occupational Safety and Health (NIOSH), takes into account the weight of an object plus several other variables in lifting tasks that contribute to the risk of injury. For example, if the situation requires frequent lifts or lifting loads far away from the body, there is an increased risk of injury. Under these conditions, the weight limit would be reduced from a baseline weight or load constant (LC) to a recommended weight limit (RW). A load constant (LC) of 23 kg (about 51 pounds) has been established by NIOSH as a load that, under ideal conditions, is safe for 75% of females and 90% of males.

To calculate the RW, you must first measure or assess several variables related to the lifting task. The six variables that are considered in determining the RW are:

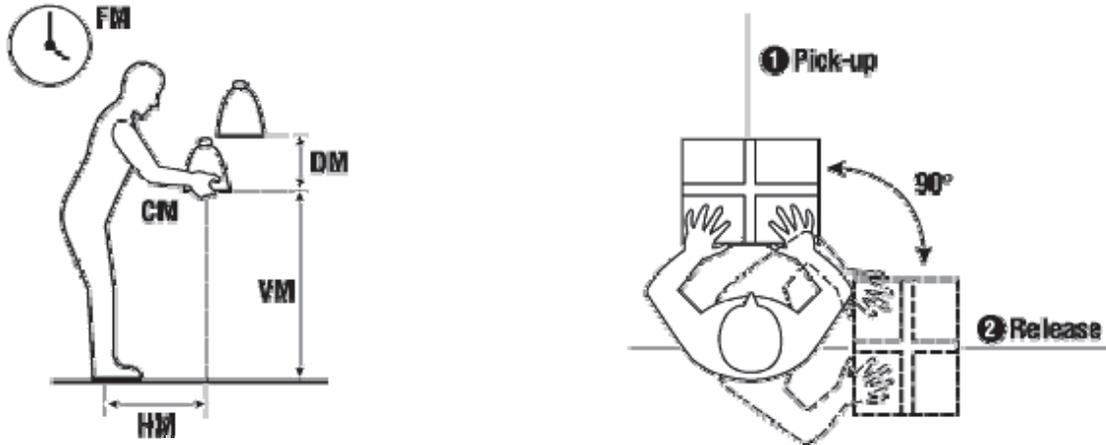
- The horizontal distance (H) the load is lifted (distance of hands from midpoint between ankles),
- The starting height of the hands from the ground (H₀),
- The vertical distance of lifting (D),
- The time between lifts or frequency of lifting (F),
- The angle of the load in relation to the body (e.g., straight in front of you or off to the side, A), and
- The quality of the grasp or handhold based on the type of handles available (hand-to-load coupling, C).

Each of these variables is then assigned a numerical value (multiplier factor) from lookup charts. The equation includes six multiplier factors to calculate the RW:

$$RW = LC \times H \times H_0 \times DM \times FM \times AM \times CM$$

Where LC is the load constant (23 kg) and other factors in the equation are:

- H, the Horizontal Multiplier factor,
- H₀, the Vertical Multiplier factor,
- DM, the Distance Multiplier factor,
- FM, the Frequency Multiplier factor,
- AM, the Asymmetric Multiplier factor, and
- CM, the Coupling Multiplier factor.



Horizontal Multiplier is the distance the object is from the body. Measure (in centimeters) the distance from the person's ankles to their hands when holding the object. Write down this number. Next, look up the number on the accompanying chart and find the matching multiplier factor. Use this factor in the lifting equation.

Vertical Multiplier is measured as the starting point of the lift and is the distance in centimeters of the hands up from the ground. Measure this distance and use the number to determine which value to use on the chart.

Distance Multiplier is the number of centimeters the load travels up (or down) from the starting position. Measure this distance and use the number to determine which value to use on the chart.

Frequency Multiplier is how often the lift is repeated within a certain time period. You need to determine if the lift is done while standing or stooping, for more or less than one hour (in total time for the shift), and how much time there is for rest between lifts.

Asymmetry Multiplier measures if the body must twist or turn during the lift. This measurement is done in degrees (with 360° being one complete circle).

Coupling Multiplier determines the coupling or type of grasp the person has on the container. It rates the type of handles as good (handles), fair (maneuver-shift cut outs in cardboard boxes) or poor. You also need to know if the lift is done in a standing or stooping position.

When these multipliers are placed into the equation, determine the RW. If the weight of the object to be lifted exceeds the RW, the task is considered to be dangerous. Assess the relevant factors which contribute most to the risk (the lower the factor, the more it contributes to the risk) and redesign the handling task.

The lifting equation only applies in certain situations. It does not apply in situations where a person is lifting (or lowering):

- With one hand,
- For over 8 hours,
- While seated or kneeling,
- In a restricted workspace,
- Objects that are unstable (such as buckets or containers of liquids),
- While pushing or pulling,
- With wheelbarrows or shovels,
- With high speed motion (faster than about 30 inches/second),
- Extremely hot or cold objects or in extreme temperatures, or
- With poor foot/floor coupling (high risk of a slip or fall).

This equation applies to most workers for:

- Two-handed lifting,
- Comfortable lifting postures, and
- Comfortable environments and non-slip floorings.

FACTORS USED IN RW CALCULATIONS

Horizontal Multiplier (M): Horizontal distance (D, in cm) from the midpoint between the ankles to the hands while holding the object.

Horizontal Distance (cm)	M Factor
25 or less	1.00
30	0.83
40	0.63
50	0.50
60	0.42

Vertical Multiplier (VM): The vertical distance (V, in cm) of the hands from the ground at the start of the lift.

Starting Height (cm)	VM Factor
0	0.78
30	0.87
50	0.93
70	0.99
100	0.93
150	0.78
175	0.70
≥175	0.00

Distance Multiplier (DM): The vertical distance (D, in cm) that the load travels.

D Lifting Distance (cm)	DM Factor
25 or less	1.00
40	0.97
55	0.90
100	0.87
145	0.85
175	0.85
≥175	0.00

Asymmetric Multiplier (AM): The twisting angle (A) of the body while lifting, measured in degrees.

A Angle (degrees)	AM Factor
90°	0.71
60°	0.81
45°	0.86
30°	0.90
0°	1.00



Frequency Multiplier (FM): The frequency (F) of lifts and the duration of lifting (in minutes or seconds) over a work shift.

F Time between lifts	FM Factor			
	Lifting While Standing		Lifting While Stooping	
	One hour or less	Over One hour	One hour or less	Over One hour
5 min	1.00	0.85	1.00	0.85
1 min	0.94	0.75	0.94	0.75
30 sec	0.91	0.65	0.91	0.65
15 sec	0.84	0.45	0.84	0.45
10 sec	0.75	0.27	0.75	0.27
6 sec	0.45	0.13	0.45	-
5 sec	0.37	-	0.37	-

Coupling Multiplier (CM): The quality of grasp (or coupling, C) classified as good, fair or poor and depends on the body position (either standing or stooping).

C Grasp Good (handles)	CM Factor	
	Standing	Stooping
Good	1.00	1.00
Fair	1.00	0.95
Poor	0.90	0.90

URS SAFETY MANAGEMENT STANDARD 0
EAIR BASED SAFETY

URS SAFETY MANAGEMENT STANDARD

Behavior-Based Safety

1. Applicability

This standard applies to all operations of URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to describe the URS approach to implementing our behavior-based safety program.

Behavior-based safety is a process that provides a higher level of safety excellence by promoting proactive involvement, building ownership, and fostering communication that relates to employee safety. A primary concept is that most accidents are due to at-risk behavior, and behavioral changes may be made that significantly reduce accident potential.

3. Implementation

Implementation of this procedure is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Definitions

1. At-Risk Behavior: Individual actions that increase the chance of injury, despite knowledge of the hazard. An example is excessive speed while driving.
2. Activators: Items that are intended to produce desired behaviors. URS activators for safety include, but are not limited to, policy statements, safety management standards (SMS), training, safety slogans, posters and signs, health and safety plans, safe work plans, safety meetings, and rules and regulations.
3. Behaviors: Visible actions on the part of individuals and can be characterized as safe (following health and safety plans, using work practices that minimize risk, coaching others on safe behavior, having safety as a priority over speed and convenience, etc.), or at-risk.
4. Consequences: Result of safe and at-risk behaviors, and can therefore be positive or negative. Examples of consequences include self-approval, reprimand, peer approval, penalty, feedback, inconvenience, and comfort. The most effective consequences are positive, immediate, and certain.

URS SAFETY MANAGEMENT STANDARD

Behavior-Based Safety

Values of Behavior-Based Safety

1. Employees hold safety as a core value.
2. Each employee feels responsible for the safety of their coworkers as well as themselves, and takes action accordingly.
3. Each employee is willing and able to go beyond the call of duty on behalf of the safety of others.

Roles for Safe Behavior

1. Supervisor's Role:

- a. Provide clearly defined safety expectations and encourage/reinforce the implementation of safety observations using the SMS 072-1 NA checklist or equivalent.
- b. Provide consequences for observed behaviors throughout the course of the work shift.

2. Co-Worker Role

- a. Intervene when observing at-risk behavior.
- b. Provide positive feedback for safe behavior.
- c. Volunteer to be observed.

Identification of At-Risk Behaviors

Observations and review of incident and near miss data will be used by URS Safety Officers to help identify at-risk behavior.

1. Employee observations.

- a. Observation checklists, either project-specific or Attachment 072-1 NA, will be used as a tool to help identify safe and at-risk behaviors and why the behavior(s) occurred.
- b. Employees will be instructed on using the checklists.
- c. Checklists will be included in the site-specific health and safety plan or the safe work plan.
- d. The checklists will include the expected safe behaviors.

URS SAFETY MANAGEMENT STANDARD
Behavior-based Safety

- e. Peers will complete the checklist for applicable work tasks.
- f. Checklists may change throughout the project to include additional behaviors.

E. Feedback to Employees

- 1. Observers will immediately provide one-on-one feedback to the observed, noting both safe and at-risk behaviors.
- 2. Observer and observee will discuss the identified barriers to safe behavior, and potential solutions.
- 3. Near-Miss and Incident Reports will be reviewed to identify at-risk behaviors and corrective actions.
- 4. Management and Health, Safety, and Environment staff will verify compliance with this standard.

F. Feedback Follow-up

- 1. Observation checklists will be collected and discussed at periodic safety meetings.
- 2. The manager will review the trends for at-risk and safe behavior, and report the trends to the employees.
- 3. Project-specific trends are analyzed and areas of additional action are identified.

G. Documentation Summary

The following documentation will be maintained in the project file:

- A. Behavior-based Safety Checklists.

H. Resources

[Attachment 072-1 NA Behavior-based Safety Checklist](#)



**Health, Safety and Environment
BEHAVIOR BASED SAFETY
CHECKLIST**

Attachment 072-1 NA

Issue Date: September 2003
Revision 2: February 2009

Job Location: _____

Date: _____

Task/Work Observed: _____

Observer: _____

	<u>Safe</u>	<u>Unsafe</u>	<u>Comments *</u>
Personal Protective Equipment			
Head	<input type="checkbox"/>	<input type="checkbox"/>	_____
Hand	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feet	<input type="checkbox"/>	<input type="checkbox"/>	_____
Eyes/Face	<input type="checkbox"/>	<input type="checkbox"/>	_____
Skin	<input type="checkbox"/>	<input type="checkbox"/>	_____
Hearing	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____
Equipment / Tools			
Proper tool for the job	<input type="checkbox"/>	<input type="checkbox"/>	_____
Condition	<input type="checkbox"/>	<input type="checkbox"/>	_____
Proper Use	<input type="checkbox"/>	<input type="checkbox"/>	_____
Body Use / Position			
Lifting	<input type="checkbox"/>	<input type="checkbox"/>	_____
Pinch Point	<input type="checkbox"/>	<input type="checkbox"/>	_____
Ladder / stairs	<input type="checkbox"/>	<input type="checkbox"/>	_____
Hand placement	<input type="checkbox"/>	<input type="checkbox"/>	_____
Travel path / speed	<input type="checkbox"/>	<input type="checkbox"/>	_____
Body position	<input type="checkbox"/>	<input type="checkbox"/>	_____
Work Practices			
Follow Safety Plan / Procedures	<input type="checkbox"/>	<input type="checkbox"/>	_____
Housekeeping	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other			
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

* Use comment column when unsafe behavior / conditions were observed. Describe what was observed and why this occurred.

URS SAFETY MANAGEMENT STANDARD 000
L00NE 000R00ER

URS SAFETY MANAGEMENT STANDARD

Lone Worker

1. Applicability

This standard is applicable to URS Corporation and its subsidiary companies.

2. Purpose and Scope

The purpose of this standard is to provide a policy for managing lone workers while working at field sites.

Individuals are considered to be lone workers when their normal duties require them to work where they cannot be seen or heard by another person cannot expect a visit from another worker or member of the public during the normal course of their work and/or where assistance is not readily available.

3. Implementation

Implementation of this standard is the responsibility of the URS manager directing activities of the facility, site, or project location.

4. Requirements

A. Conduct a hazard assessment to determine:

1. Type or nature of work being conducted by the lone worker
2. Location of the work
3. Length of time worker will be working alone
4. Characteristics of the individual working alone that may increase the risk to that worker (e.g., medical conditions)
5. Hazards of the work location that may increase the risk to that worker (e.g., high crime area) and
6. The working conditions the lone worker may experience (e.g., heat/cold stress, unstable terrain, wild animals).

B. Prohibit individuals from acting as lone workers if work activities involve any of the following:

1. Working from heights greater than 3 feet (1 meter).
2. Confined spaces.

URS SAFETY MANAGEMENT STANDARD
Lone Worker

3. Work involving electricity.
 4. Work over or near water.
 5. Working in an area where there is an increased potential for violence.
 6. Work in hazardous areas of mine sites.
- . Prepare a Lone Worker Communication Plan.
1. Using Attachment 084-1 NA (or equivalent) □ Lone Worker Communication Plan, determine the frequency of contact the lone worker will make with the Project Manager or designated alternate (PM).
 2. Determine the method of contact that will be made with the lone worker by the PM. If the use of a cell phone is the primary method of contact, cell phone coverage in the area of the work location must be verified prior to work activities beginning.
 3. Establish a contingency plan that will address steps to be taken if the lone worker does not contact the PM at the frequency established in Attachment 084-1 NA. The contingency plan should be specific and assign roles and responsibilities.
 4. Discuss the communication plan with the lone worker prior to work activities beginning.
 5. Both the lone worker and PM must sign Attachment 084-1.
 6. A copy of Attachment 084-1 NA will be given to the lone worker prior to work activities beginning. The PM will maintain a copy until the work has been completed. After the work has been completed, Attachment 084-1 NA will be placed in the project safety file.

□. **Documentation Summary**

The following documentation will be maintained in the project file:

- A. Lone Worker Communication Plan

URS SAFETY MANAGEMENT STANDARD
One Worker

1. Resources

- A. [Working Alone in Safety Controlling the Risks of Solitary Work](#)
- 1. [Facts: Violence at Work](#)
- 1. [Attachment 084-1 NA One Worker Communication Plan](#)



Health, Safety and Environment
LONE WORKER COMMUNICATION PLAN

Attachment 084-1 NA
Issue Date: May 2007
Revision 1: February 2009

Project Name: _____ Project Location: _____

Project Manager: _____ Project Number: _____

Lone Worker: _____ Expected Dates;
Duration of Work
Activities: _____

Work Activities:

Frequency of contact with the Project Manager/Supervisor:

Method of contact with the Project Manager/Supervisor:

Contingency plan if contact does not occur. Be specific.

The Lone Worker and Project Manager/Supervisor have reviewed this Lone Work Communication Plan. Both the Lone Worker and the Project Manager/Supervisor understand their responsibilities as stated in this Lone Worker Communication Plan.

Lone Worker:

Name Signature Date

Project Manager/Supervisor:

Name Signature Date

APPENDIX B
MATERIAL SAFETY DATA SHEETS/SAFETY CARDS

MSDS Number: **M1599** * * * * * *Effective Date: 08/20/08* * * * * * *Supersedes: 12/19/05*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MERCURY

1. Product Identification

Synonyms: Quicksilver; hydrargyrum; Liquid Silver

CAS No.: 7439-97-6

Molecular Weight: 200.59

Chemical Formula: Hg

Product Codes:

J.T. Baker: 2564, 2567, 2569

Mallinckrodt: 1278, 1280, 1288

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Mercury	7439-97-6	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Life)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:

May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointestinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:

Causes irritation and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion.

Eye Contact:

Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:

Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:

Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

6. Accidental Release Measures

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor.

Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker CINNASORB® and RESISORB® are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Acceptable Ceiling Concentration:

mercury and mercury compounds: 0.1 mg/m³ (TWA), skin

- ACGIH Threshold Limit Value (TLV):

inorganic and metallic mercury, as Hg: 0.025 mg/m³ (TWA) skin, A4 Not classifiable as a human carcinogen.

- ACGIH Biological Exposure Indices:

total inorganic mercury in urine (preshift): 35 ug/g creatinine;

total inorganic mercury in blood (end of shift): 15 ug/l.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with a mercury vapor or chlorine gas cartridge may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with a mercury vapor or chlorine gas cartridge may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator.

WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Silver-white, heavy, mobile, liquid metal.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

13.55

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

356.7C (675F)

Melting Point:

-38.87C (-38F)

Vapor Density (Air=1):

7.0

Vapor Pressure (mm Hg):

0.0018 @ 25C (77F)

Evaporation Rate (BuAc=1):

4

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

At high temperatures, vaporizes to form extremely toxic fumes.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.

Conditions to Avoid:

Heat, flames, ignition sources, metal surfaces and incompatibles.

11. Toxicological Information

Toxicological Data:

Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

All forms of mercury can cross the placenta to the fetus, but most of what is known has

been learned from experimental animals. See Chronic Health Hazards.

Carcinogenicity:

EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Mercury (7439-97-6)	No	No	3

12. Ecological Information

Environmental Fate:

This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.

Environmental Toxicity:

This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY

Hazard Class: 8

UN/NA: UN2809

Packing Group: III

Information reported for product/size: 1LB

International (Water, I.M.O.)

Proper Shipping Name: MERCURY

Hazard Class: 8

UN/NA: UN2809

Packing Group: III

Information reported for product/size: 1LB

15. Regulatory Information

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-----\Chemical Inventory Status - Part 1\-----
Ingredient                                     TSCA  EC   Japan  Australia
-----
Mercury (7439-97-6)                          Yes   Yes  No     Yes

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-----\Chemical Inventory Status - Part 2\-----
Ingredient                                     Korea  DSL   NDSL  Phil.
-----
Mercury (7439-97-6)                          Yes   Yes  No     Yes

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-----\Federal, State & International Regulations - Part 1\-----
Ingredient                                     -SARA 302-  -SARA 313-
RQ   TPQ   List  Chemical Catg.
-----
Mercury (7439-97-6)                          No   No   Yes   No

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-----\Federal, State & International Regulations - Part 2\-----
Ingredient                                     -RCRA-    -TSCA-
CERCLA  261.33   8(d)
-----
Mercury (7439-97-6)                          1        U151    No

```

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 2Z

Poison Schedule: S7

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MATERIALS BROUGHT TO SITE

MSDS Number: A2052 * * * * * Effective Date: 09/22/09 * * * * * Supercedes: 08/03/07



From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALCONOX®

1. Product Identification

Synonyms: Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.

CAS No.: Not applicable.

Molecular Weight: Not applicable to mixtures.

Chemical Formula: Not applicable to mixtures.

Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox® proprietary detergent mixture	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight

Flammability Rating: 0 - None

Reactivity Rating: 0 - None

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES

Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:

May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.

Ingestion:

May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

Skin Contact:

No adverse effects expected.

Eye Contact:

May cause irritation, redness and pain.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not expected to be a fire hazard.

Explosion:

No information found.

Fire Extinguishing Media:

Dry chemical, foam, water or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. When mixed with water, material foams profusely. Small amounts of residue may be flushed to sewer with plenty of water.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moisture may cause material to cake. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

White powder interspersed with cream colored flakes.

Odor:

No information found.

Solubility:

Moderate (1-10%)

Specific Gravity:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

No information found.

Conditions to Avoid:

No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Alconox® proprietary detergent mixture	No	No	None

12. Ecological Information

Environmental Fate:

This product is biodegradable.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Alconox® proprietary detergent mixture	Yes	No	No	No

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.

Alconox® proprietary detergent mixture	No	No	Yes	No
-----\Federal, State & International Regulations - Part 1\-----				
	--SARA 302--		-----SARA 313-----	
Ingredient	RQ	TPQ	List	Chemical Catg.
Alconox® proprietary detergent mixture	No	No	No	No
-----\Federal, State & International Regulations - Part 2\-----				
		-RCRA-	-TSCA-	
Ingredient	CERCLA	261.33	8 (d)	
Alconox® proprietary detergent mixture	No	No	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
 Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 0 Flammability: 0 Reactivity: 0

Label Hazard Warning:

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

Label Precautions:

Avoid contact with eyes.
 Keep container closed.
 Use with adequate ventilation.
 Avoid breathing dust.
 Wash thoroughly after handling.

Label First Aid:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

UNOCAL CHEMICALS DIV UNION OIL CO OF CALIFORNIA -- ANTIFREEZE -- 6850-00-664-1403

=====
Product Identification
=====

Product ID:ANTIFREEZE
MSDS Date:03/21/1989
FSC:6850
NIIN:00-664-1403
MSDS Number: BJPTD
=== Responsible Party ===
Company Name:UNOCAL CHEMICALS DIV UNION OIL CO OF CALIFORNIA
Address:1345 N MEACHAM RD
City:SCHAUMBURG
State:IL
ZIP:60195
Country:US
Info Phone Num:312-490-2539
Emergency Phone Num:312-490-2539
CAGE:5W323
=== Contractor Identification ===
Company Name:UNOCAL CHEMICALS DIV UNION OIL CO OF CALIFORNIA
Address:1345 N MEACHAM RD
Box:City:SCHAUMBURG
State:IL
ZIP:60195
Country:US
Phone:800-967-7601
CAGE:5W323

=====
Composition/Information on Ingredients
=====

Ingred Name:ETHYLENE GLYCOL (SARA III)
CAS:107-21-1
RTECS #:KW2975000
Fraction by Wt: 92-97%
Other REC Limits:NONE SPECIFIED
OSHA PEL:C 50 PPM
ACGIH TLV:C 50 PPM,VAPOR; 9192
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:DIETHYLENE GLYCOL
CAS:111-46-6
RTECS #:ID5950000
Other REC Limits:NONE SPECIFIED

=====
Hazards Identification
=====

LD50 LC50 Mixture:ACUTE ORAL LD50 (HUMAN) IS 1500 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INGESTION:ABDOMINAL DISCOMFORT OR PAIN, NAUSEA, CENTRAL NERVOUS SYSTEM DEPRESSION. SEVERE KIDNEY AND LIVER DAMAGE FROM LARGE AMOUNTS; MAY BE FATAL.
INHALATION:IRRITATION OF THE NOSE AND THROAT. EYE:DISCOMFORT WITH TRANSIENT CONJUNCTIVITIS. CHRONIC: INHALATION OF MIST MAY PRODUCE SIGNS OF CNS DISTURBANCES.
Explanation of Carcinogenicity:NONE OF THE COMPOUNDS IN THIS PRODUCT IS

LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.

Effects of Overexposure:MAY CAUSE DIZZINESS, MALAISE, LUMBAR PAIN, UREMIA, AND CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE EYE, SKIN & RESPIRATORY TRACT IRRITATION.

Medical Cond Aggravated by Exposure:PERSONS WITH A HISTORY OF KIDNEY OR LIVER DISORDERS MAYBE AT INCREASED RISK FROM EXPOSURE.

=====
 ===== First Aid Measures =====
 =====

First Aid:INHALATION: REMOVE TO FRESH AIR. CALL A PHYSICIAN IF DISCOMFORT PERSISTS. EYE: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES. CALL A PHYSICIAN. SKIN: WASH WITH PLENTY OF SOAP & WATER. REM OVE CONTAMINATED CLOTHING/SHOES. INGESTION: IF CONSCIOUS, GIVE 2 GLASSES OF WATER TO DRINK AND INDUCE VOMITING WITH IPECAC SYRUP-NOTHING BY MOUTH IF UNCONSCIOUS. CALL A PHYSICIAN IMMEDIATELY.

=====
 ===== Fire Fighting Measures =====
 =====

Flash Point Method:COC
 Flash Point:250F,121C
 Lower Limits:1.6
 Upper Limits:10.8
 Extinguishing Media:USE CARBON DIOXIDE, FOAM, OR DRY CHEMICAL. WATER MAY BE INEEFFECTIVE.
 Fire Fighting Procedures:FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
 Unusual Fire/Explosion Hazard:FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS. HEATED VAPORS MAY CAUSE FLASH BACK.

=====
 ===== Accidental Release Measures =====
 =====

Spill Release Procedures:SMALL SPILL: WIPE/SOAK UP WITH PAPER TOWEL OR INERT ABSORBENT. PUT IN DISPOSAL CONTAINER. FLUSH RESIDUE WITH WATER. LARGE SPILL: VENTILATE AREA. IF POSSIBLE, STOP LEAK. DIKE TO RETAIN RUN OFF. VACUUM UP FREE LIQUID. FLUSH RESIDUE WITH WATER.
 Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER. WATER DILUTION RECOMMENDED.

=====
 ===== Handling and Storage =====
 =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.
 Other Precautions:DO NOT TAKE INTERNALLY. DO NOT BREATHE MIST. AVOID PROLONGED OR REPEATED BREATHING OF VAPOR. AVOID CONTACT WITH EYES. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. FOR INDUSTRIAL USE ONLY.

=====
 ===== Exposure Controls/Personal Protection =====
 =====

Respiratory Protection:IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED ORGANIC VAPOR CARTRIDGE AND DUST/MIST PRE-FILTER RESPIRATORS AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/ WARNINGS AND NIOSH-RESPIRATOR SELECTION.
 Ventilation:MECHANICAL (GENERAL) ROOM VENTILATION IS ADEQUATE IF USE IS ENCLOSED. LOCAL EXHAUST IS NEEDED IF VENTED INTO WORK AREA.

Protective Gloves:NEOPRENE, NITRILE, PVC OR NATURAL RUBBER
Eye Protection:SAFETY GOGGLES WITH OPTIONAL FACE SHIELD
Other Protective Equipment:EYE WASH STATION AND SAFETY SHOWER.
INDUSTRIAL-TYPE WORK CLOTHING AND APRON AS REQUIRED.
Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND
RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR
FOOTWEAR.

Supplemental Safety and Health
DO NOT TAKE INTERNALLY. DO NOT GET ON SKIN OR IN EYES. AVOID PROLONGED
OR REPEATED BREATHING OF VAPOR. DO NOT BREATHE MISTS. WASH
THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING OR SMOKING
OR USING REST ROOM.

===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:330F,166C
Vapor Pres:0.06 @20C
Vapor Density:2.1 AIR=1
Spec Gravity:1.108
Solubility in Water:COMPLETE
Appearance and Odor:CLEAR GREEN LIQUID - SLIGHT ODOR
Percent Volatiles by Volume:NEG.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS
Stability Condition to Avoid:HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES
Hazardous Decomposition Products:CARBON MONOXIDE AND CARBON DIOXIDE

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL SHOULD BE MADE BY INCINERATION IN
ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND
REGULATIONS. AT VERY LOW CONCENTRATIONS IN WATER, DISPOSE OF THIS
MATERIAL IN A BIOLOGICAL WASTE WATER TREATMENT PLANT.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Bentonite

ACC# 02585

Section 1 - Chemical Product and Company Identification

MSDS Name: Bentonite**Catalog Numbers:** B235-500**Synonyms:** Bentonite magma; Southern bentonite; tixoton; VOLCLAY bentonite; Wilkinite.**Company Identification:**

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1302-78-9	BENTONITE	100	215-108-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cream to gray brown powder.

Warning! Causes eye, skin, and respiratory tract irritation. May cause cancer based on animal studies. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. When inhaled as a dust or fume, may cause benign pneumoconiosis. Can produce delayed pulmonary edema.

Chronic: May cause cancer according to animal studies. Effects may be delayed. Chronic inhalation may cause lung changes, chest pain, breath shortness, and bronchitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

BENTONITE	none listed	none listed	none listed
-----------	-------------	-------------	-------------

OSHA Vacated PELs: BENTONITE: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: cream to gray brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Insoluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:Not applicable.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Moisture, Increase volume significantly when water is added..

Hazardous Decomposition Products: Exposure to moist air or water.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1302-78-9: CT9450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1302-78-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found. Effects of Bentonite in workers in processing plant experienced a very high incidence of bronchial asthma, (25%) in workers examined. This was attributed to the irritating action of the bentonite dust on the bronchial epithelium.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1302-78-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1302-78-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1302-78-9: No information available.

Canada - DSL/NDSL

CAS# 1302-78-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #8 Date: 6/13/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

SANEX CHEMICALS, INCORPORATED -- DEET (INSECT REPELLANT) -- 6840-00-753-4963

===== Product Identification =====

Product ID:DEET (INSECT REPELLANT)
MSDS Date:01/01/1987
FSC:6840
NIIN:00-753-4963
MSDS Number: BFNFR
=== Responsible Party ===
Company Name:SANEX CHEMICALS, INCORPORATED
Address:21 WEBSTER STREET
City:NORTH TONAWANDA
State:NY
ZIP:14120-5809
Country:US
Info Phone Num:416-677-4890 - CANADA #
Emergency Phone Num:716-694-9325
CAGE:1EW21

===== Contractor Identification =====

Company Name:SANEX CHEMICALS, INC.
Address:15 WEBSTER STREET
Box:City:NORTH TONAWANDA
State:NY
ZIP:14120
Country:US
CAGE:1EW21

===== Composition/Information on Ingredients =====

Ingred Name:N,N'-DIETHYL-M-TOLUAMIDE CONTAINING 5% RELATED COMPOUNDS.
CAS:134-62-3
RTECS #:XS3675000
Fraction by Wt: 75%.

Ingred Name:ETHYL ALCOHOL (ETHANOL)
CAS:64-17-5
RTECS #:KQ6300000
Fraction by Wt: 25%.
OSHA PEL:1000 PPM
ACGIH TLV:1000 PPM; 9192

===== Hazards Identification =====

LD50 LC50 Mixture:LD50 (ORAL RAT) = 2000 MG/KG
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:NOT KNOWN
Effects of Overexposure:INHALATION AND SWALLOWING CAN CAUSE
DIZZINESS,DROWSINESS,NAUSEA AND VOMITING.

===== First Aid Measures =====

First Aid:INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR;
IF BREATHING DIFFICULT GIVE OXYGEN. EYE:IMMEDIATELY FLUSH WITH
PLENTY OF WATER. SKIN: WASH WITH SOAP & WATER. REMOVE CONTAMINATED
CLOTHING & SHOES. INGESTION: DO NOT INDUCE VOMITING. NOTHING BY
MOUTH IF UNCONSCIOUS.

===== Fire Fighting Measures =====

Flash Point Method:TCC
 Flash Point:73F,23C
 Extinguishing Media:CARBON DIOXIDE, FOAM, DRY CHEM.
 Fire Fighting Procedures:NONE
 Unusual Fire/Explosion Hazard:NOT ESTABLISHED.

===== Accidental Release Measures =====

Spill Release Procedures:LARGE SPILL (> GAL): REMOVE IGNITION SOURCES, VENTILATE AREA WELL. ABSORB WITH VERMICULITE OR OTHER MATERIALS, SUCH AS SAWDUST, RAGS, PAPER & PLACE IN CLOSED CONTAINER. USE NON SPARKING TOOLS. WEAR PROPER PROTECTIVE EQUIPMENT DURING CLEAN UP PROCEDURES

===== Handling and Storage =====

Handling and Storage Precautions:NONE NORMALLY REQUIRED. KEEP CONTAINERS TIGHTLY CLOSED.
 Other Precautions:AVOID REPEATED USE OF THE PRODUCT. READ INSTRUCTIONS BEFORE USE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED.
 Ventilation:GENERAL ROOM VENTILATION. FOR BULK HANDLING: LOCAL EXHAUST TO ELIMINATE MISTS/FUMES/GASES.
 Protective Gloves:IF NEEDED, USE RUBBER GLOVES
 Eye Protection:IF NEEDED, USE SAFETY/CHEM GOGGLES
 Other Protective Equipment:NONE
 Supplemental Safety and Health
 MSDS RECEIVED FROM SANEX WAS UNDATED. ACUTE ORAL LD50 RAT=2000MG/KG/. AT THE TIME (6/25/90) OF UPDATE THIS ENTRY, SUPPLIER DID NOT HAVE MSDS FOR THIS PRODUCT. HEALTH/SPILL DATA ESTABLISHED BY DGSC.

===== Physical/Chemical Properties =====

HCC:F3
 Boiling Pt:B.P. Text:171F,77C
 Vapor Pres:31.
 Spec Gravity:0.9414
 Evaporation Rate & Reference:1.7
 Appearance and Odor:CLEAR LIQUID,VERY MILD ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
 Stability Condition to Avoid:VERY HIGH TEMP.
 Hazardous Decomposition Products:INCOMPLETELY BURNED CARBON PRODUCTS, CO*2, CO.

===== Disposal Considerations =====

Waste Disposal Methods:KEEP IN COVERED DRUMS,PENDING DISPOSAL. HANDLE & DISPOSE IN FULL COMPLIANCE WITH ALL APPLICABLE INTERNATIONAL,FEDERAL,STATE, & LOCAL REGULATIONS.

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AMOCO OIL COMPANY -- LS NO. 2 DIESEL FUEL -- 9140-00-286-5295

===== Product Identification =====

Product ID:LS NO. 2 DIESEL FUEL
 MSDS Date:09/24/1993
 FSC:9140
 NIIN:00-286-5295
 MSDS Number: BJPSJ
 === Responsible Party ===
 Company Name:AMOCO OIL COMPANY
 Address:200 EAST RANDOLPH DRIVE
 City:CHICAGO
 State:IL
 ZIP:60601
 Country:US
 Info Phone Num:312-856-3907
 Emergency Phone Num:800-447-8735/800-424-9300
 Preparer's Name:DONALD M. BARKER,DIR
 CAGE:15958

=== Contractor Identification ===

Company Name:AMOCO OIL CO
 Address:200 E RANDOLPH DR
 Box:City:CHICAGO
 State:IL
 ZIP:60601-6401
 Country:US
 Phone:312-856-3907- EM HLTH: 800 447-8735
 CAGE:15958
 Company Name:SPENCER OIL CORP (810-775-5022)
 CAGE:5W753

===== Composition/Information on Ingredients =====

Ingred Name:PETROLEUM DISTILLATE, NO. 2 FUEL OIL
 CAS:68476-30-2
 RTECS #:LS8930000
 Fraction by Wt: N/GIVEN
 Other REC Limits:NONE RECOMMENDED

Ingred Name:NAPHTHALENE (SARA III)
 CAS:91-20-3
 RTECS #:QJ0525000
 Fraction by Wt: 1%
 Other REC Limits:NONE RECOMMENDED
 OSHA PEL:10 PPM
 ACGIH TLV:10 PPM/15 STEL; 9394
 EPA Rpt Qty:100 LBS
 DOT Rpt Qty:100 LBS

Ingred Name:XYLENES (O-,M-,P- ISOMERS) (SARA III)
 CAS:1330-20-7
 RTECS #:ZE2100000
 Fraction by Wt: 1%
 Other REC Limits:NONE RECOMMENDED
 OSHA PEL:100 PPM
 ACGIH TLV:100 PPM/150STEL;9394
 EPA Rpt Qty:1000 LBS
 DOT Rpt Qty:1000 LBS

===== Hazards Identification =====

LD50 LC50 Mixture:LD50,ORAL FOR SIMILAR PRODUCT >5G/KG.
 Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
 Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
 Health Hazards Acute and Chronic:NO SIGNIFICANT EYE HEALTH HAZ
 IDENTIFIED. CAN CAUSE SKIN IRRIT ON PROLONG/REPEAT CONTACT. NO
 SIGNIFICANT INHAL HEALTH HAZ IDENTIFIED FOR THE LIQUID FUEL.LOW
 VISCOSITY PRODUCT. HARMFUL OR FATAL IF SWAL LOWED & THEN ASPIRATED
 INTO LUNGS CAUSING CHEM PNEUMONIA & DEATH. KIDNEY DAMAGE IN MALE
 RATS W/MATLS OF THIS TYPE.
 Explanation of Carcinogenicity:PER MSDS NO INGRED PRESENT @ LEVELS FOR
 CARCINO.NIOSH RECOMMENDS WHOLE DIESEL EXHAUST REGARDED AS POTENTIAL
 OCCUP CARCIN
 Effects of Overexposure:INHAL OF VAPORS FROM HEATED MATL IN CONFINED
 AREA CAUSES DIZZINESS, HEADACHE, NAUSEA, POSSIBLE IRRIT OF
 EYE/NOSE/THROAT.
 Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MFG.

===== First Aid Measures =====

First Aid:EYE:FLUSH W/PLENTY OF WATER. SKIN:WASH W/SOAP & WATER. REMOVE
 CONTAMIN CLOTHING/SHOE. INHAL:IF ADVERSE EFFECTS OCCUR REMOVE TO
 UNCONTAMINATED AREA. INGEST:DO NOT INDUCE VOMIT. GET IMMED MED
 ATTN.

===== Fire Fighting Measures =====

Flash Point Method:TCC
 Flash Point:120F,49C
 Lower Limits:0.6
 Upper Limits:7.5
 Extinguishing Media:AGENTS APPROVED FOR CLASS B HAZ (E.G. DRY CHEMICAL,
 CARBON DIOXIDE, HALOGENATED AGENTS, FOAM, STEAM) OR WATER FOG.
 Fire Fighting Procedures:NONE SPECIFIED BY MFG; HOWEVER WEAR
 APPROPRIATE PROTECTIVE EQIPMENT.
 Unusual Fire/Explosion Hazard:COMBUSTIBLE LIQUID.

===== Accidental Release Measures =====

Spill Release Procedures:REMOVE OR SHUT OFF ALL SOURCES OF IGNITION.
 PREVENT SPREADING BY DIKING, DITCHING, OR ABSORBING ON INERT
 MATERIALS. IF SPILLED INTO WATERS FO USA IT MAY BE REPORTABLE UNDER
 33 CFR PART 153 IF IT PRODU CES A SHEEN.
 Neutralizing Agent:NONE SPECIFIED BY MFG.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COMBUSTILBLE LIQUIDS STORAGE
 AREA. STORE AWAY FROM HEAT, IGNITIN SOURCES, AND OPEN FLAME IN
 ACCORDANCE W/APPLICABLE FED/STATE/LOC REGS.
 Other Precautions:THE CONTAINER FOR THIS PRODUCT CAN PRESENT EXPLOSION
 OR FIRE HAZARDS, EVEN WHEN EMPTIED. TO AVOID RISK OF INJURY, DO NOT
 CUT, PUNCTURE OR WELD ON OR NEAR THIS CONTIANER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE SPECIFIED BY MFG. HOWEVER, USE WITH
 ADEQUATE VENTILATION. IF AIR CONTAMINANTS LEVEL ABOVE ESTABLISHED

EXPOSURE LIMITS USE APPROPRIATE NIOSH APPROVED RESP.
 Ventilation:USE WITH ADEQUATE VENTILATION.
 Protective Gloves:WEAR PROTECTIVE GLOVES.
 Eye Protection:NONE REQUIRED;HOWEVER USE EYE PROTECTION
 Other Protective Equipment:WEAR PROTECTIVE CLOTHING IF PROLONG/REPEAT
 CONTACT. EYE PROTECTION IS GOOD INDUSTRIAL PRACTICE.
 Work Hygienic Practices:WASH HANDS AFTER HANDLING.PRACTICE GOOD
 PERSONAL HYGENIC PRACTICES.THOROUGHLY CLEAN & DRY CONTAMIN CLOTHING
 BEFORE REUSE
 Supplemental Safety and Health
 BOILING PT RANGE:340F-675F APPROX. FROM SKIN-PAINTING STUDIES OF PETRO
 DISTILLATES OF SIMILAR COMPOSITION & DISTILLATE RANGE HAS BEEN
 SHOWN THESE MATLS OFTEN POSSES WEAK CARCINOGENIC ACTIVITY IN LAB A
 NIMALS.MFG HAVE CHOSEN TO BE CAUTIOUS IN LIGHT OF FINDINGS W/OTHER
 DISTILLATED STREAMS.

===== Physical/Chemical Properties =====

HCC:F4
 Boiling Pt:B.P. Text:340F,171C
 Spec Gravity:0.85-0.88
 Viscosity:>1.8 CST
 Solubility in Water:NEGLIGIBLE (<0.1%)
 Appearance and Odor:CLEAR, WATER SHITE TO BLUE-GREEN LIQUID.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
 AVOID CHLORINE, FLUORINE, AND OTHER STRONG OXIDIZERS.
 Stability Condition to Avoid:KEEP AWAY FROM IGNITIN SOURCES (E.G. HEAT
 AND OPEN FLAMES).
 Hazardous Decomposition Products:INCOMPLETE BURNING CAN PRODUCE CARBON
 MONOXIDE &/OR CARBON DIOXIDE AND OTHER HARMFUL PRODUCTS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE W/APPLICABLE
 LOCAL, STATE AND FEDERAL REGULATIONS. ENCLOSED-CONTROLLED
 INCINERATION IS RECOMMENDED UNLESS DIRECTED OTHERWISE BY APPLICABLE
 ORDINANCES. PRODUCT EXEMPT FROM CERCLA REPORTING REQMTS UNDER
 40CFRPART302.4.

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 assume responsibility for the suitability of this information to their
 particular situation.

CHEVRON -- UNLEADED GASOLINE, CPS201110 -- 9130-00N018990

===== Product Identification =====

Product ID:UNLEADED GASOLINE, CPS201110
 MSDS Date:03/06/1991
 FSC:9130
 NIIN:00N018990
 MSDS Number: CFZGX
 === Responsible Party ===
 Company Name:CHEVRON
 Box:4054
 City:RICHMOND
 State:CA
 ZIP:94804
 Country:US
 Info Phone Num:800-582-3835
 Emergency Phone Num:800-582-3835
 CAGE:0AHD1
 === Contractor Identification ===
 Company Name:CHEVRON ENVIRONMENTAL HEALTH CENTER INC
 Address:15299 SAN PABLO AVE
 Box:4054
 City:RICHMOND
 State:CA
 ZIP:94804
 Country:US
 Phone:800-582-3835
 CAGE:0AHD1

===== Composition/Information on Ingredients =====

Ingrid Name:ING 12:BE EPIGENETIC PROCESS UNIQUE TO FEMALE MOUSE. INHAL
 EXPOS TO WHOLE GAS VAP ALSO CAUSED KIDNEY DMG & (ING 14)
 RTECS #:9999999ZZ

Ingrid Name:ING 13:EVENTUALLY KIDNEY CANCER IN MALE RATS. NOTE:TOLUENE
 APPEARS ON NAVY LIST OF OCCUP CHEM REPRO HAZS. SEEK (ING 15)
 RTECS #:9999999ZZ

Ingrid Name:ING 14:CONSULTATION FROM APPROP HLTH PROFESSIONALS
 CONCERNING LATEST HAZ LIST INFO & SAFE HNDLG & EXPOS INFO (ING 16)
 RTECS #:9999999ZZ

Ingrid Name:ING 15:. FOR MORE COMPLETE INFORMATION, CONTACT NEHC .
 RTECS #:9999999ZZ

Ingrid Name:FIRST AID PROC:OBTAINED, THEN TAKE PERS & PROD CNTNR TO
 NEAREST MED EMER TREATMENT CENTER/HOSPITAL. NOTE TO MD: (ING 18)
 RTECS #:9999999ZZ

Ingrid Name:ING 17:INGESTION OF THIS PRODUCT OR SUBSEQUENT VOMITING CAN
 RESULT IN ASPIRATION WHICH CAN CAUSE PNEUMONITIS.
 RTECS #:9999999ZZ

Ingrid Name:SPILL PROC:REPORTING SPILLS OF THIS MATL THAT COULD REACH
 ANY SURE WATERS. TOLL FREE NUMBER FOR U.S. COAST GUARD(ING 20)
 RTECS #:9999999ZZ

Ingred Name:ING 19:NATIONAL RESPONSE CENTER IS (800) 424-8802.
RTECS #:9999999ZZ

Ingred Name:WASTE DISP METH:CONTAM MATLS IN DISPOSABLE CNTNRS & DISPOSE
OF IN A MANNER CONSISTENT W/APPLIC REGS. CONT LOC (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21:ENVIRONMENTAL OR HEALTH AUTHORITIES FOR APPROVED
DISPOSAL OF THIS MATERIAL.
RTECS #:9999999ZZ

Ingred Name:ING 11:LIVER TUMORS IN FEMALE MICE. MECHANISM OF THIS
RESPONSE IS STILL BEING INVESTIGATED BUT IT IS THOUGHT TO (ING 13)
RTECS #:9999999ZZ

Ingred Name:GASOLINE
CAS:8006-61-9
RTECS #:LX3300000
Fraction by Wt: 100%
OSHA PEL:300 PPM
ACGIH TLV:300 PPM;500 STEL

Ingred Name:BENZENE, ETHYL-; (ETHYLBENZENE) (SARA 313)
CAS:100-41-4
RTECS #:DA0700000
Fraction by Wt: <1.4%
OSHA PEL:100 PPM
ACGIH TLV:100 PPM;125 STEL
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:P-XYLENE; (P-DIMETHYLBENZENE) (SARA 313) (CERCLA)
CAS:106-42-3
RTECS #:ZE2625000
Fraction by Wt: <0.9%
OSHA PEL:100 PPM
ACGIH TLV:100 PPM;150 STEL
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:M-XYLENE; (M-DIMETHYLBENZENE) (SARA 313) (CERCLA)
CAS:108-38-3
RTECS #:ZE2275000
Fraction by Wt: <4.6%
OSHA PEL:100 PPM
ACGIH TLV:100 PPM;150 STEL
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:O-XYLENE; (O-DIMETHYLBENZENE) (SARA 313) (CERCLA)
CAS:95-47-6
RTECS #:ZE2450000
Fraction by Wt: <2.2%
OSHA PEL:100 PPM
ACGIH TLV:100 PPM;150 STEL
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:TOLUENE (SARA 313) (CERCLA)
CAS:108-88-3

RTECS #:XS5250000
 Fraction by Wt: <6.5%
 OSHA PEL:200 PPM
 ACGIH TLV:50 PPM, S
 EPA Rpt Qty:1000 LBS
 DOT Rpt Qty:1000 LBS

Ingred Name:HEXANE; (N-HEXANE) (CERCLA)
 CAS:110-54-3
 RTECS #:MN9275000
 Fraction by Wt: <3%
 OSHA PEL:500 PPM
 ACGIH TLV:50 PPM
 EPA Rpt Qty:1 LB
 DOT Rpt Qty:1 LB

Ingred Name:CYCLOHEXANE (SARA 313) (CERCLA)
 CAS:110-82-7
 RTECS #:GU6300000
 Fraction by Wt: <2.4%
 OSHA PEL:300 PPM
 ACGIH TLV:300 PPM
 EPA Rpt Qty:1000 LBS
 DOT Rpt Qty:1000 LBS

Ingred Name:METHYL TERT-BUTYL ETHER (SARA 313) (CERCLA)
 CAS:1634-04-4
 RTECS #:KN5250000
 Fraction by Wt: <15%
 OSHA PEL:N/K
 ACGIH TLV:N/K
 EPA Rpt Qty:1 LB
 DOT Rpt Qty:1 LB

Ingred Name:BENZENE (SARA 313) (CERCLA). OSHA PEL:1 PPM TWA; 5 PPM STEL (MFR).
 CAS:71-43-2
 RTECS #:CY1400000
 Fraction by Wt: <4.9%
 OSHA PEL:SEE INGREDIENT
 ACGIH TLV:10 PPM
 EPA Rpt Qty:10 LBS
 DOT Rpt Qty:10 LBS

Ingred Name:SUPDAT:(CALLED ASPIR). CAN CAUSE SEV INJURY TO LUNGS & DEATH. LIFETIME INHAL OF WHOLE GAS VAP HAS CAUSED INCR (ING 12)
 RTECS #:9999999ZZ

===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) >5 ML/KG.
 Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
 Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:YES
 Health Hazards Acute and Chronic:EYE CONT:SLIGHTLY IRRIT & COULD CAUSE PRLNG (DAYS) IMPAIRMENT OF VISION. SIGNS & SYMPS MAY INCL PAIN, TEARS, SWELL, REDNESS & BLURRED VISION. VAPS, FUMES/SPRAY MIST COULD ALSO CAUSE SIMILAR SIGNS & SY MPS. SKIN IRRIT:RPTD CONT MAY CAUSE SKIN TO CRACK/DRY FROM DEFAT ACTION. INHAL:SLIGHTLY TOX. TARGET (EFTS OF OVEREXP)
 Explanation of Carcinogenicity:BENZENE:IARC MONOGRAPHS, SUPP, VOL 7, PG

120, 1987:GRP 1. NTP 7TH ANNUAL RPT ON CARCINS, 1994:KNOWN TO BE (SUPP DATA)

Effects of Overexposure:HLTH HAZ:ORGAN:NERV SYS. CONCS >1000 PPM MAY CAUSE CNS EFTS SUCH AS HDCH, DIZZ, LOSS OF APPETITE, WEAK & LOSS OF COORD. CONCS >5000 PPM MAY CAUSE LOSS OF CONSCIOUSNESS, COMA & DEATH. INGEST:SLIGHTLY T OX IF SWALLOWED. TARGET ORGAN:NERV SYS.SIGNS & SYMPS OF CNS EFTS MAY INCL HDCH, DIZZ, LOSS OF APPETITE, WEAK & (SUPDAT)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES:FLUSH IMMED W/FRESH WATER FOR AT LST 15 MINS WHILE HOLDING LIDS OPEN. REMOVE CONT LENSES IF WORN. IF IRRIT PERSISTS, SEE MD. SKIN:WASH THORO W/SOAP & WATER. REMOVE & WASH CONTAM CLTHG. INHAL:MOVE TO FRESH AIR. IF ANY EFTS CONTINUE, SEE MD. INGEST:GIVE WATER/MILK TO DRINK & TELEPHONE FOR MED ADVICE. DO NOT MAKE PERS VOMIT UNLESS DIRECTED TO DO SO BY MED PERS. IF MED ADVICE CANNOT BE (ING 17)

===== Fire Fighting Measures =====

Flash Point Method:PMCC

Flash Point:<-49F,<-45C

Lower Limits:1.4%

Upper Limits:7.6%

Extinguishing Media:FIRE FIGHTING FOAM:ALCOHOL RESISTANT TYPE (AR). AFFF, CO*2, DRY CHEMICAL.

Fire Fighting Procedures:USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EXTREME FIRE HAZ. LIQ VERY QUICKLY EVAPS, EVEN AT LOW TEMPS & FORMS VAP (FUMES) WHICH CAN CATCH FIRE & BURN W/EXPLO VIOLENCE. INVISIBLE VAP SPREADS (SUPP DATA)

===== Accidental Release Measures =====

Spill Release Procedures:ELIM ALL SOURCES OF IGNIT. CLEAN UP SPILLS IMMED, OBSERVING PRECS IN PROT EQUIP SECTION. MATL IS CONSIDERED TO BE WATER POLLUTANT & RELS SHOULD BE PREVENTED FROM CONTAM SOIL & WATER & FROM ENTERING DR AINAGE & SEWER SYS. U.S.A. REGS REQ (ING 19)

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:USE ONLY AS MOTOR FUEL. DO NOT USE FOR CLEANING, PRESS APPLIANCE FUEL/ANY OTHER SUCH USE. USE ONLY IN WELL VENTED AREA. KEEP OUT OF REACH OF CHILDREN.

Other Precautions:DO NOT USE/STORE NEAR FLAME, SPKS/HOT SURFS. KEEP CNTNR CLSD. DO NOT TRANSFER LIQ TO UNLABELED CNTNR. DO NOT WELD, HEAT/DRILL CNTNR. REPLACE CAP/BUNG. EMPTIED CNTNR STILL CNTNS HAZ/EXPLO VAP/LIQ. READ & OBSERVE ALL PRECS ON PROD LABEL.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NO SPECIAL PROTECTION IS NORMALLY REQUIRED. HOWEVER, IF OPERATING CONDITIONS CREATE AIRBORNE CONCENTRATIONS WHICH EXCEED RECOMMENDED EXPOSURE STANDARDS, USE OF A NIOSH APPROVED RESPIRATOR IS REQUIRED.

Ventilation:USE ONLY IN WELL VENTILATED AREAS.

Protective Gloves:IMPERVIOUS GLOVES .
 Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
 Other Protective Equipment:ANSI APPROVED EYE WASH FOUNTAIN & DELUGE
 SHOWER . CONTACT CAN BE MINIMIZED BY WEARING PROTECTIVE CLOTHING.
 Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
 Supplemental Safety and Health
 EXPLO HAZ:EASILY & CAN BE SET ON FIRE BY MANY SOURCES SUCH AS PILOT
 LIGHTS, WELDING EQUIP & ELEC MOTORS & SWITCHES. EXPLAN OF
 CARCIN:CARCIN. OSHA REGULATED:29 CFR 1910.1028. HUMAN:MYELOID
 LEUKEMIA, HO DGKINS DISEASE, LYMPHOMA. EFTS OF OVEREXP:LOSS OF
 COORD. SUBSTANCE CAN DIRECTLY ENTER LUNGS IF IT IS SWALLOWED (ING
 11)

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:>77F,>25C
 Vapor Pres:5-15 @100F
 Vapor Density:3-4
 Spec Gravity:0.7-0.8
 Solubility in Water:INSOLUBLE
 Appearance and Odor:ORANGE TO BRONZE LIQUID.
 Percent Volatiles by Volume:>99

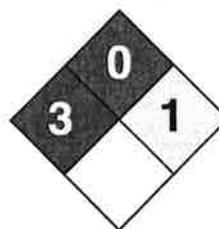
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
 MAY REACT W/STRONG OXIDIZING AGENTS, SUCH AS CHLORATES, NITRATES,
 PEROXIDES, ETC.
 Stability Condition to Avoid:NEVER SIPHON GASOLINE BY MOUTH.
 Hazardous Decomposition Products:NORMAL COMBUSTION FORMS CARBON DIOXIDE
 & WATER VAPOR; INCOMPLETE COMBUSTION CAN PRODUCE CARBON MONOXIDE.

===== Disposal Considerations =====

Waste Disposal Methods:DISP MUST BE I/A/W FED, STATE & LOC REGS . CLEAN
 UP SM SPILLS USING APPROP TECHNIQUES SUCH AS SORBENT MATLS/PUMPING.
 WHERE FEASIBLE & APPROP, REMOVE CONTAM SOIL. FOLLOW PRESCRIBED
 PROCS FOR REPO RTING & RESPONDING TO LGR RELS. PLACE (ING 21)

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 particular situation.



Health	3
Fire	0
Reactivity	1
Personal Protection	

Material Safety Data Sheet

Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:

Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl₄ Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca₃P₂ Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO₄ Hexalithium disilicide H₂SO₄ Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U₃P₄ , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m³) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m³) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m³) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:

108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:

-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:

1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:

Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:

Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothermic reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the following can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinum, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:

Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:

Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fetotoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjunctivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and laryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well as headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomiting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophageal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:

Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):

CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):

R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité international Ltée. 1986.

Other Special Considerations: Not available.

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International Chemical Safety Cards

ISOBUTENE

ICSC: 1027

<p style="text-align: center;">ISOBUTENE Isobutylene 2-Methylpropene (cylinder) $C_4H_8/CH_2=C(CH_3)_2$ Molecular mass: 56.1</p> <p>CAS # 115-11-7 RTECS # UD0890000 ICSC # 1027 UN # 1055 EC # 601-012-00-4</p>			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable.	NO open flames, NO sparks, and NO smoking. NO contact with oxidizing materials.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with sand, powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive. Risk of fire and explosion on contact with oxidants, halogens (see Chemical Dangers).	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Use non-sparking handtools.	In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.
EXPOSURE			
• INHALATION	Dizziness. Drowsiness. Dullness. Nausea. Unconsciousness. Vomiting.	Closed system and ventilation.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
• SKIN	ON CONTACT WITH LIQUID; FROSTBITE.	Cold-insulating gloves.	ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention.
• EYES	Frostbite.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION			
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Evacuate danger area! Consult an expert! Ventilation. Remove all sources of ignition. Do NOT wash away into sewer. NEVER direct water jet on liquid (extra personal protection: self-	Fireproof. Separated from incompatible substances (see Chemical Dangers). Cool.	F symbol F+ symbol R: 12 S: (2-)9-16-33	

contained breathing apparatus).

Note: C
UN Hazard Class: 2.1**SEE IMPORTANT INFORMATION ON BACK****ICSC: 1027**

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

ISOBUTENE

ICSC: 1027

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS COMPRESSED LIQUEFIED GAS OR COLOURLESS VOLATILE LIQUID, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The gas is heavier than air and may travel along the ground; distant ignition possible, and may accumulate in low ceiling spaces causing deficiency of oxygen. As a result of flow, agitation, etc., electrostatic charges can be generated.</p> <p>CHEMICAL DANGERS: The substance can presumably form explosive peroxides. The substance is able to polymerize with fire or explosion hazard. Reacts violently with oxidants, chlorine, fluorine, nitrogen oxides, hydrogen chloride, hydrogen bromide, causing fire and explosion hazard.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): MAK not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation.</p> <p>INHALATION RISK: On loss of containment this liquid evaporates very quickly causing supersaturation of the air with serious risk of suffocation when in confined areas. A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the central nervous system. Exposure may result in death. Medical observation is indicated.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</p>
	<p>PHYSICAL PROPERTIES</p> <p>Boiling point: -6.9°C Melting point: -140.3°C Relative density (water = 1): 0.59 Solubility in water: practically insoluble Vapour pressure, kPa at 20°C: 1976</p>	<p>Relative vapour density (air = 1): 1.94 Flash point: flammable°C Auto-ignition temperature: 465°C Explosive limits, vol% in air: 1.8-9.6%</p>
ENVIRONMENTAL DATA		
NOTES		
Density of the liquid at boiling point: 0.605 kg/l. High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering area. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.		
Transport Emergency Card: TEC (R)-502 NFPA Code: H 1; F 4; R 0;		
ADDITIONAL INFORMATION		

ICSC: 1027**ISOBUTENE**

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**IMPORTANT
LEGAL
NOTICE:**

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MATERIAL SAFETY DATA SHEET

EQUILON MSDS: 52500E-06 01/04/99

SH/CG4 HEAVY DUTY MOTOR OIL 15W-40

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE

EQUIVA SERVICES: 877-276-7283

CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE

877-276-7285

NAME AND ADDRESS

EQUILON ENTERPRISES LLC

PRODUCT STEWARDSHIP

P.O. BOX 674414

HOUSTON, TX 77267-4414

SECTION I

NAME

PRODUCT: SH/CG4 HEAVY DUTY MOTOR OIL 15W-40

CHEM NAME: MIXTURE (SEE SECTION II-A)

CHEM FAMILY: PETROLEUM HYDROCARBON: MOTOR OIL

SHELL CODE: 50019

HEALTH HAZARD: 1 FIRE HAZARD: 1 REACTIVITY: 0

SECTION II-A

PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NO.	PERCENT
P	SH/CG4 HEAVY DUTY MOTOR OIL 15W-40		
1	HYDROTREATED HEAVY PARAFFINIC DISTILLATE	64742-54-7	40-95
2	SOLVENT DEWAXED, HEAVY PARAFFINIC DISTILLATE	64742-65-7	0-55
3	HYDROTREATED RESIDUAL OIL	64742-57-0	5-15
4	HYDROTREATED SPENT LUBRICATING OIL	64742-58-1	5-10
5	SOLVENT DEWAXED RESIDUAL OILS	64742-62-7	5-10
6	ADDITIVES CONTAINING	MIXTURE	2-3
6A	ZINC COMPOUND		1-2
NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0			

SECTION II-B

ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE		
1	>5.0 G/KG, RAT*	>5.0 G/KG, RABBIT*	

SECTION III

HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT: LUBRICATING BASE OILS ARE GENERALLY CONSIDERED NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT: LUBRICATING BASE OILS ARE GENERALLY CONSIDERED NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED OR REPEATED CONTACT MAY CAUSE VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE.

INHALATION: INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST OF THIS PRODUCT MAY RESULT IN MILD IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT.

INGESTION: LUBRICATING BASE OILS ARE GENERALLY CONSIDERED NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS: IRRITATION AS NOTED ABOVE.

AGGRAVATED MEDICAL CONDITIONS:

PREEXISTING SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO

THIS PRODUCT.

OTHER HEALTH EFFECTS:

THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA). THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER HAS DETERMINED THAT THERE IS SUFFICIENT EVIDENCE FOR THE CARCINOGENICITY IN EXPERIMENTAL ANIMALS OF USED MOTOR OILS. HANDLING PROCEDURES AND SAFETY PRECAUTIONS IN THE MSDS SHOULD BE FOLLOWED TO MINIMIZE EMPLOYEE'S EXPOSURE.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

COMP NO.	OSHA PEL/TWA	OSHA PEL/CEILING	TLV/TWA	ACGIH TLV/STEL	OTHER
P	5 MG/M3*		5 MG/M3*	10 MG/M3*	

*OIL MIST, MINERAL

SECTION V EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION: REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.*

NOTE TO PHYSICIAN: *IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED

SECTION VII PHYSICAL DATA

BOILING POINT (DEG F):	SPECIFIC GRAVITY (H2O = 1):	VAPOR PRESSURE (MM HG):
NOT APPLICABLE	0.8844	<0.1
MELTING POINT (DEG F):	SOLUBILITY IN WATER:	VAPOR DENSITY (AIR = 1):
-20 (POUR POINT)	NEGLIGIBLE	NOT AVAILABLE
		VISCOSITY: 101
		(CS @ 104 DEG F)

EVAPORATION RATE (NORMAL BUTYL ACETATE = 1): NOT AVAILABLE

APPEARANCE AND ODOR: DARK RED LIQUID; STRONG HYDROCARBON ODOR

PHYS/CHEM PROPERTIES: SEE ABOVE FOR DETAILS

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD: 415 DEG. F. (PMCC)

FLAMMABLE LIMITS/PERCENT VOLUME IN AIR: LOWER: N/AV HIGHER: N/AV

EXTINGUISHING MEDIA:

USE WATER FOG, FOAM, DRY CHEMICAL OR CO₂. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS:
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE IDENTIFIED

SECTION IX REACTIVITY

STABILITY: STABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR
CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION:
IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS AND PARTICULATES.

PROTECTIVE CLOTHING
AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. AVOID CONTACT WITH EYES. WEAR SAFETY GLASSES OR GOGGLES AS APPROPRIATE. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE GLOVES.

ADDITIONAL PROTECTIVE MEASURES:
NONE IDENTIFIED

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES:
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING, APPLYING COSMETICS, OR USING TOILET FACILITIES. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. CONTAMINATED LEATHER ARTICLES INCLUDING SHOES CANNOT BE DECONTAMINATED AND SHOULD BE DESTROYED TO PREVENT REUSE.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:

NOT HAZARDOUS BY D.O.T. REGULATIONS.
 DOT PROPER SHIPPING NAME: NOT APPLICABLE
 OTHER REQUIREMENTS: NOT APPLICABLE

SECTION XIV

OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES. PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV

STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	CAS NO	PERCENT	STATE CODE
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ZINC COMPOUND	NONE	1-2	MA, NJ
---------------	------	-----	--------

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI

SPECIAL NOTES

PRODUCT NAME CHANGED; FORMERLY 'HEAVY DUTY II MOTOR OIL 15W-40'.
 ADDITIONAL CHANGES WERE MADE TO THE EDS IN SECTIONS III AND IV.

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT DATA. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF EQUIVA SERVICES, LLC AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF EQUIVA SERVICES, LLC.

ENVIRONMENTAL DATA SHEET

EQUILON EDS: 52500E

SH/CG4 HEAVY DUTY MOTOR OIL 15W-40

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE

GENERAL MSDS ASSISTANCE

EQUIVA SERVICES: 877-276-7283
 CHEMTREC: 800-424-9300

877-276-7285

NAME AND ADDRESS

EQUILON ENTERPRISES
 PRODUCT STEWARDSHIP
 P.O. BOX 674414
 HOUSTON, TX 77267-4414

PRODUCT CODE: 50019

SECTION I PRODUCT COMPOSITION

NO.	COMPOSITION	CAS	PERCENT
P	SH/CG4 HEAVY DUTY MOTOR OIL 15W-40	MIXTURE	100
1	HYDROTREATED HEAVY PARAFFINIC DISTILLATE	64742-54-7	40-95
2	SOLVENT DEWAXED, HEAVY PARAFFINIC DISTIL LATE	64742-65-7	0-55
3	HYDROTREATED RESIDUAL OIL	64742-57-0	5-15
4	HYDROTREATED SPENT LUBRICATING OIL	64742-58-1	5-10
5	SOLVENT DEWAXED RESIDUAL OILS	64742-62-7	5-10
6	ADDITIVES CONTAINING	MIXTURE	2-3
6A	ZINC COMPOUND		1-2

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (*1)	EHS TPQ (*2)	SEC-313 (*3)	313 CATEGORY (*4)	311/312 CATEGORY (*5)
6A			YES	ZINC COMPOUND	

- *1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
- *2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
- *3 = TOXIC CHEMICAL, SEC 313
- *4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
- *5 = CATEGORY (FOR AGGREGATE REPORTING REQUIREMENTS UNDER SARA 311, 312)
 - HEALTH: H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD
 - H-2 = DELAYED (CHRONIC) HEALTH HAZARD
 - PHYSICAL: P-3 = FIRE HAZARD
 - P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
 - P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS COVERED BY EPA'S COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) PETROLEUM EXCLUSION. THEREFORE, RELEASES TO AIR, LAND, OR WATER ARE NOT REPORTABLE UNDER CERCLA ("SUPERFUND"). HOWEVER, UNDER SECTION 311 OF EPA'S CLEAN WATER ACT (CWA), THIS PRODUCT IS CONSIDERED AN OIL. AS SUCH, SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

THIS PRODUCT IS AN OIL UNDER 49 CFR (DOT) PART 130. IF SHIPPED BY RAIL OR HIGHWAY IN A TANK WITH A CAPACITY OF 3,500 GALLONS OR MORE, IT IS SUBJECT TO THE REQUIREMENTS OF PART 130. MIXTURE SOLUTIONS IN WHICH THIS PRODUCT IS PRESENT AT 10% OR MORE MAY ALSO BE SUBJECT TO THIS RULE.

SECTION IV RCRA INFORMATION

IF THIS PRODUCT BECOMES A WASTE, IT WOULD NOT BE A HAZARDOUS WASTE BY RCRA CRITERIA (40 CFR 261). PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN

COMPLIANCE WITH LOCAL REGULATIONS.

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT DATA. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

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KAREN G. HAYNES

EQUIVA SERVICES LLC
P.O. BOX 674414
HOUSTON, TX 77267-4414

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL

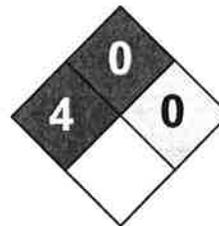
(877) 276-7285

FOR EMERGENCY ASSISTANCE PLEASE CALL

EQUIVA SERVICES LLC: (877) 276-7283

CHEMTREC: (800) 424-9300

}



Health	3
Fire	0
Reactivity	0
Personal Protection	

Material Safety Data Sheet

Nitric acid, 65% MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nitric acid, 65%

Catalog Codes: SLN2161

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Water; Nitric acid, fuming

CI#: Not applicable.

Synonym: Nitric Acid, 65%

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Water	7732-18-5	35
Nitric acid, fuming	7697-37-2	65

Toxicological Data on Ingredients: Nitric acid, fuming: VAPOR (LC50): Acute: 244 ppm 0.5 hours [Rat]. 344 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to lungs, mucous membranes, upper respiratory

tract, skin, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of combustible materials

Explosion Hazards in Presence of Various Substances:

Explosive in presence of reducing materials, of organic materials, of metals, of alkalis. Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:

Flammable in presence of cellulose or other combustible materials. Phosphine, hydrogen sulfide, selenide all ignite when fuming nitric acid is dripped into gas. (Nitric Acid, fuming)

Special Remarks on Explosion Hazards:

Reacts explosively with metallic powders, carbides, cyanides, sulfides, alkalies and turpentine. Can react explosively with many reducing agents. Arsine, phosphine, tetraborane all oxidized explosively in presence of nitric acid. Cesium and rubidium

acetylides explode in contact with nitric acid. Explosive reaction with Nitric Acid + Nitrobenzene + water. Detonation with Nitric Acid + 4-Methylcyclohexane. (Nitric acid, fuming)

Section 6: Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:

Corrosive liquid. Oxidizing material. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 2 STEL: 4 (ppm) from ACGIH (TLV) [United States] TWA: 2 STEL: 4 from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Acrid. Disagreeable and choking. (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.
Color: Colorless to light yellow.
pH (1% soln/water): Acidic.
Boiling Point: 121°C (249.8°F)
Melting Point: -41.6°C (-42.9°F)
Critical Temperature: Not available.
Specific Gravity: 1.408 (Water = 1)
Vapor Pressure: 6 kPa (@ 20°C)
Vapor Density: 2.5 (Air = 1)
Volatility: Not available.
Odor Threshold: 0.29 ppm
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water, diethyl ether.
Solubility:
Easily soluble in cold water, hot water. Soluble in diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances:

Highly reactive with alkalis. Reactive with reducing agents, combustible materials, organic materials, metals, acids.

Corrosivity:

Extremely corrosive in presence of aluminum, of copper. Non-corrosive in presence of glass, of stainless steel(304), of stainless steel(316), of brass.

Special Remarks on Reactivity:

A strong oxidizer. Reacts violently with alcohol, organic material, turpene, charcoal. Violent reaction with Nitric acid + Acetone and Sulfuric acid. Nitric Acid will react with water or steam to produce heat and toxic, corrosive and flammable vapors. (Nitric acid, fuming)

Special Remarks on Corrosivity:

In presence of traces of oxides, it attacks all base metals except aluminum and special chromium steels. It will attack some forms of plastics, rubber, and coatings. No corrosive effect on bronze. No corrosivity data for zinc, and steel

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

LD50: Not available. LC50: Not available.

Chronic Effects on Humans:

Contains material which may cause damage to the following organs: lungs, mucous membranes, upper respiratory tract, skin, eyes, teeth.

Other Toxic Effects on Humans:

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: LDL - Lowest Published Lethal Dose [Human] - Route: Oral; Dose: 430 mg/kg (Nitric acid, fuming)

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (effects on newborn and fetotoxicity) based on animal data. (Nitric acid, fuming)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Severely irritates skin. Causes skin burns and may cause deep and penetrating ulcers of the skin with a characteristic yellow to brownish discoloration. May be fatal if absorbed through skin. Eyes: Severely irritates eyes. Causes eye burns. May cause irreversible eye injury. Ingestion: May be fatal if swallowed. Causes serious gastrointestinal tract irritation or burns with nausea, vomiting, severe abdominal pain, and possible "coffee grounds" appearance of the vomitus . May cause perforation of the digestive tract. Inhalation: May be fatal if inhaled. Vapor is extremely hazardous. Vapor may cause nitrous gas poisoning. Effects may be delayed. May cause irritation of the mucous membranes and respiratory tract with burning pain in the nose and throat, coughing, sneezing, wheezing, shortness of breath and pulmonary edema. Other symptoms may include nausea, and vomiting. Chronic Potential Health Effects: Repeated inhalation may produce changes in pulmonary function and/or chronic bronchitis. It may also affect behavior (headache, dizziness, drowsiness, muscle contraction or spasticity, weakness, loss of coordinaton, mental confusion), and urinary system (kidney failure, decreased urinary output after several hours of

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Nitric acid UNNA: 2031 PG: II

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:

New York release reporting list: Nitric acid, fuming Rhode Island RTK hazardous substances: Nitric acid, fuming Pennsylvania RTK: Nitric acid, fuming Florida: Nitric acid, fuming Minnesota: Nitric acid, fuming Massachusetts RTK: Nitric acid, fuming

New Jersey: Nitric acid, fuming TSCA 8(b) inventory: Water; Nitric acid, fuming SARA 302/304/311/312 extremely hazardous substances: Nitric acid, fuming SARA 313 toxic chemical notification and release reporting: Nitric acid, fuming 65% CERCLA: Hazardous substances.: Nitric acid, fuming: 1000 lbs. (453.6 kg);

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):

R8- Contact with combustible material may cause fire. R35- Causes severe burns. S23- Do not breathe gas/fumes/vapour/spray [***] S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36- Wear suitable protective clothing. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 4

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 10:59 AM

Last Updated: 11/01/2010 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

SCOTT SPECIALTY GASES -- NITROGEN -- 6830-01-096-7474

===== Product Identification =====

Product ID:NITROGEN
 MSDS Date:10/16/1996
 FSC:6830
 NIIN:01-096-7474
 MSDS Number: BXWDV
 === Responsible Party ===
 Company Name:SCOTT SPECIALTY GASES
 Address:ROUTE 611 NORTH
 Box:D-11
 City:PLUMSTEADVILLE
 State:PA
 ZIP:18949
 Country:US
 Info Phone Num:215-766-8861
 Emergency Phone Num:215-766-8861
 CAGE:51847

=== Contractor Identification ===
 Company Name:SCOTT SPECIALTY GASES
 Address:6141 EASTON RD (6141 ROUTE 611)
 Box:310
 City:PLUMSTEADVILLE
 State:PA
 ZIP:18934
 Country:US
 Phone:215-766-8861/ FAX: 215-766-0416
 CAGE:51847

===== Composition/Information on Ingredients =====

Ingred Name:NITROGEN
 CAS:7727-37-9
 RTECS #:QW9700000
 Fraction by Wt: >99%
 Other REC Limits:NONE RECOMMENDED
 ACGIH TLV:ASPHYXIAN; 9596

===== Hazards Identification =====

LD50 LC50 Mixture:NOT RELEVANT
 Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
 Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
 Health Hazards Acute and Chronic:TARGET ORGANS:LUNGS. ACUTE- NITROGEN
 IS NONTOXIC BUT MAY PRODUCE SUFFOCATION BY DISPLACING OXYGEN. THIS
 PRODUCT IS A GAS. CANNOT BE SWALLOWED. CHRONIC- NONE.
 Explanation of Carcinogenicity:NONE
 Effects of Overexposure:DIZZINESS, RAPID RESPIRATION, MUSCULAR
 INCOORDINATION, WEAKENED SPEECH LEADING TO THE INABILITY TO UTTER
 SOUNDS, RAPID REDUCTION IN THE ABILITY TO PERFORM MOVEMENTS,
 REDUCED CONSCIOUSNESS OF SURROUNDINGS, FATIGUE, NAUSEA, VOMITING,
 UNCONSCIOUSNESS AND DEATH
 Medical Cond Aggravated by Exposure:NONE

===== First Aid Measures =====

First Aid:PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF

OVEREXPOSURE. RESCUE PERSONNEL SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS. INHALED:REMOVE TO FRESH AIR. PROVIDE OXYGEN/CPR IF NEEDED. SKIN:NON E. EYES:NONE. ORAL:NONE.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Lower Limits:NOT RELEVANT
Upper Limits:NOT RELEVANT
Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL FOR SURROUNDING FIRE. NITROGEN CANNOT CATCH FIRE.
Fire Fighting Procedures:WEAR SELF CONTAINED BREATHING APPARATUS. IMMEDIATELY DELUGE CONTAINERS WITH WATER SPRAY FROM MAXIMUM DISTANCE UNTIL COOL, THEN MOVE CONTAINERS AWAY IF NO RISK.
Unusual Fire/Explosion Hazard:CYLINDERS MAY RUPTURE DUE TO HEAT OF FIRE. NO PART OF CYLINDER SHOULD BE SUBJECTED TO A TEMPERATURE HIGHER THAN 52C (125F).

=====
===== Accidental Release Measures =====

Spill Release Procedures:USE APPROPRIATE PROTECTIVE EQUIPMENT. VENTILATE AREA. REMOVE LEAKING CYLINDER TO EXHAUST HOOD OR SAFE OUTDOOR AREA. SHUT OFF SOURCE OF LEAK IF POSSIBLE. REMOVE HEAT SOURCES.
Neutralizing Agent:NOT RELEVANT

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, VENTILATED AREA. KEEP OUT OF REACH OF SMALL CHILDREN. STORE UPRIGHT AND FIRMLY SECURED
Other Precautions:WASH HANDS AFTER HANDLING. NEVER CARRY A COMPRESSED GAS CYLINDER IN AN ENCLOSED SPACE SUCH AS A CAR TRUNK, VAN OR STATION VAGON. USE ONLY IN WELL VENTILATED AREA. DO NOT DRAG, SLIDE OR ROLL CYLINDERS. USE A SUITABLE HAND TRUCK TO MOVE THEM.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED. IN EMERGENCIES, WEAR A NIOSH-APPROVED POSITIVE PRESSURE AIR LINE WITH MASK OR SELF-CONTAINED BREATHING APPARATUS.
Ventilation:LOCAL EXHAUST
Protective Gloves:ANY MATERIAL WHEN HANDLING CYLINDERS
Eye Protection:SAFETY GLASSES/GOGGLES RECOMMENDED
Other Protective Equipment:SAFETY SHOES
Work Hygienic Practices:OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

HCC:G3
NRC/State Lic Num:NOT RELEVANT
Boiling Pt:B.P. Text:-320F,-196C
Melt/Freeze Pt:M.P/F.P Text:-346F,-210C
Vapor Density:0.967
Spec Gravity:GAS
Viscosity:NOT RELEVANT
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:1.485 CM3/100 CM3

Appearance and Odor:COLORLESS, ODORLESS GAS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
LITHIUM AT HIGH TEMPERATURES
Stability Condition to Avoid:EXCESSIVE HEAT
Hazardous Decomposition Products:NONE

===== Disposal Considerations =====

Waste Disposal Methods:SLOWLY RELEASE INTO ATMOSPHERE OR RETURN IN THE SHIPPING CONTAINER PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE. FOLLOW ALL LOCAL, STATE AND FEDERAL REGULATIONS

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TEXAS INDUSTRIES, INC. -- PORTLAND CEMENT -- 5610-00-242-3792

===== Product Identification =====

Product ID:PORTLAND CEMENT
 MSDS Date:11/01/1985
 FSC:5610
 NIIN:00-242-3792
 MSDS Number: BJVZF
 === Responsible Party ===
 Company Name:TEXAS INDUSTRIES, INC.
 Address:715 AVE H. EAST
 City:ARLINGTON
 State:TX
 ZIP:76010
 Info Phone Num:(817) 640-1701
 Emergency Phone Num:(817) 640-1701
 CAGE:0B3F8
 === Contractor Identification ===
 Company Name:TEXAS INDUSTRIES, INC
 Address:715 AVE H. EAST
 Box:City:ARLINGTON
 State:TX
 ZIP:76010
 Phone:(214) 637-3100
 CAGE:0B3F8

===== Composition/Information on Ingredients =====

Ingrid Name:PORTLAND CEMENT
 CAS:65997-15-1
 RTECS #:VV8770000
 Fraction by Wt: 58%
 Other REC Limits:50 MPPCF (MSHA)
 OSHA PEL:15 MG/M3 TDUST
 ACGIH TLV:10 MG/M3 TDUST; 9293

Ingrid Name:CALCIUM CARBONATE (MARBLE) (LIMESTONE)
 CAS:1317-65-3
 RTECS #:EV9580000
 Fraction by Wt: 40%
 OSHA PEL:15 MG/M3 TDUST
 ACGIH TLV:10 MG/M3 TDUST; 9192

Ingrid Name:GYPSUM
 CAS:13397-24-5
 RTECS #:MG2360000
 Fraction by Wt: 2%
 Other REC Limits:5 MG/CUM RESP DUST
 OSHA PEL:15 MG/CUM TOTAL DUST
 ACGIH TLV:10 MG/CUM

===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
 Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
 Health Hazards Acute and Chronic:EYES/SKIN: DUST CAN CAUSE
 INFLAMMATION OF THE CORNEA, IRRITATION & ALKALI BURNS. INHALATION:
 IRRITATION TO NASAL PASSAGES, PULMONARY DISEASES, PNEUMONOCOINOSIS

& SILICOSIS.

Explanation of Carcinogenicity:NONE

Effects of Overexposure:EYES/SKIN: DUST CAN CAUSE INFLAMMATION OF THE CORNEA, IRRITATION, ALKALI BURNS, & ALLERGIC DERMATITIS.

INHALATION: IRRITATION TO NASAL PASSAGES, PULMONARY DISEASES, PNEUMONOCOCONIOSIS & SILICOSIS.

Medical Cond Aggravated by Exposure:RESPIRATORY DISORDERS/DISEASES, DERMATITIS, OTHER SKIN DISORDERS, & HYPERSENSITIVE.

=====
 ===== First Aid Measures =====
 =====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS. SKIN: WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR OR OXYGEN IF NEEDED. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
 ===== Fire Fighting Measures =====
 =====

Flash Point:WILL NOT IGNITE

Unusual Fire/Explosion Hazard:CONTACT W/STRONG ACIDS MAY PRODUCE A VIOLENT, EXOTHERMIC REACTION & MAY EVOLVE TOXIC GASES OR VAPORS, DEPENDING UPON THE ACID INVOLVED.

=====
 ===== Accidental Release Measures =====
 =====

Spill Release Procedures:CLEAN-UP OF SPILLS MAY REQUIRE PERSONAL PROTECTION EQUIPMENT.

=====
 ===== Handling and Storage =====
 =====

Handling and Storage Precautions:STORE AWAY FROM STRONG ACIDS.

UNINTENTIONAL CONTACT W/WATER SHOULD BE AVOIDED TO PRESERVE PRODUCT. MATERIAL IS HIGHLY ALKALINE.

Other Precautions:AVOID CONTACT W/SKIN, EYES & CLOTHING.

=====
 ===== Exposure Controls/Personal Protection =====
 =====

Respiratory Protection:USE NIOSH/MSHA APPROVED FOR PROTECTION AGAINST SILICA & NUISANCE DUSTS.

Ventilation:PROVIDE MECHANICAL/LOCAL EXHAUST VENTILATION TO KEEP <TLV.

Protective Gloves:RUBBER, PVC, NEOPRENE, IMPERVIOUS

Eye Protection:GOGGLES

Other Protective Equipment:RUBBER HIGH TOP BOOTS, BARRIER CREAMS, ARM SLEEVES & APRON

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

=====
 ===== Physical/Chemical Properties =====
 =====

Spec Gravity:2.80-2.17

Solubility in Water:SLIGHT (0.1-1.0%)

Appearance and Odor:FINE GREY POWDER W/N ODOR

Percent Volatiles by Volume:0%

=====
 ===== Stability and Reactivity Data =====
 =====

Stability Indicator/Materials to Avoid:YES

STRONG ACIDS

Hazardous Decomposition Products:VAPORS & TOXIC GASES

=====
 ===== Disposal Considerations =====
 =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, &
FEDERAL REGULATIONS.

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particular situation.

FAIRFIELD AMERICAN CORP -- 82680 PERMANONE TICK REPELLENT -- 6840-00F029029

===== Product Identification =====

Product ID:82680 PERMANONE TICK REPELLENT
 MSDS Date:07/31/1991
 FSC:6840
 NIIN:00F029029
 MSDS Number: BRVJJ
 === Responsible Party ===
 Company Name:FAIRFIELD AMERICAN CORP
 Address:201 RT 17 N
 City:RUTHERFORD
 State:NJ
 ZIP:07070
 Country:US
 Info Phone Num:201-507-4880
 Emergency Phone Num:201-507-4880
 Preparer's Name:REGULATORY DEPARTMENT
 CAGE:66146
 === Contractor Identification ===
 Company Name:FAIRFIELD AMERICAN CORP AN AOSI CO
 Address:201 RT 17 NORTH
 Box:City:RUTHERFORD
 State:NJ
 ZIP:07070
 Country:US
 Phone:201-507-4880
 CAGE:66146

===== Composition/Information on Ingredients =====

Ingred Name:WEIGHT PER GALLON IN POUNDS: 6.597
 RTECS #:9999999WG

Ingred Name:KEROSENE (PETROLEUM), HYDROTREATED; PETROLEUM DISTILLATE,
 HYDROTREATED ,(MINERAL SPIRITS)
 CAS:64742-47-8
 RTECS #:OA5504000
 Fraction by Wt: 4.50%

Ingred Name:PERMETHRIN
 CAS:52645-53-1
 RTECS #:GZ1255000
 Fraction by Wt: 0.50%
 ACGIH TLV:NOT EST.

Ingred Name:STODDARD SOLVENT (PETROLEUM DISTILLATE), MINERAL SPIRITS
 CAS:8052-41-3
 RTECS #:WJ8925000
 Fraction by Wt: 5.50%
 Other REC Limits:350 MG/CUM
 OSHA PEL:500 PPM
 ACGIH TLV:100 PPM; 9293

===== Hazards Identification =====

LD50 LC50 Mixture:LD50 ORAL (RAT): >5 G/KG
 Routes of Entry: Inhalation:NO Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
 Health Hazards Acute and Chronic:SLIGHT IRRITANT TO EYES.
 Explanation of Carcinogenicity:NONE

===== First Aid Measures =====

First Aid:INGESTION: CONTACT A PHYSICIAN OR POISON CONTROL CENTER.
 EYES: FLUSH W/PLENTY OF WATER. SKIN: WASH W/SOAP & WATER.
 INHALATION: REMOVE TO FRESH AIR. OBTAIN MEDICAL ATTENTION IN ALL
 CASES.

===== Fire Fighting Measures =====

Flash Point Method:TCC
 Flash Point:>200F
 Extinguishing Media:FOAM, CO2, DRY CHEMICAL & WATER FOG.

===== Accidental Release Measures =====

Spill Release Procedures:SOAK UP W/ABSORBENT MATERIAL SUCH AS SAND,
 SAWDUST, EARTH, FULLER'S EARTH ETC. DISPOSE OF W/CHEMICAL WASTE.

===== Handling and Storage =====

Handling and Storage Precautions:CONTENTS UNDER PRESSURE. DON'T STORE
 NEAR HEAT OR OPEN FLAME. DON'T PUNCTURE OR INCINERATE CONTAINER.
 AVOID CONTACT W/FACE, EYES, & SKIN.
 Other Precautions:EXPOSURE TO TEMPERATURES >130F MAY CAUSE BURSTING.
 DON'T CONTAMINATE WATER, FOOD, OR FEED BY STORAGE OR DISPOSAL.
 PRODUCT SHOULD NOT BE APPLIED TO CLOTHING WHILE IT IS BEING WORN.
 AVOID BREATHING VAPO RS OR SPRAY MIST. SEE SUPP

===== Exposure Controls/Personal Protection =====

Ventilation:NORMAL (MECHANICAL) EXHAUST
 Protective Gloves:RUBBER OR IMPERVIOUS
 Eye Protection:SAFETY GLASSES OR GOGGLES
 Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
 REUSE. WASH THOROUGHLY AFTER HANDLING & BEFORE EATING OR SMOKING.
 Supplemental Safety and Health
 PRECAUTIONS CONT.: UNDER NO CIRCUMSTANCES SHOULD BARE SKIN/CLOTHING ON
 THE BODY BE TREATED. DON'T ALLOW CONTACT W/TREATED SURFACES UNTIL
 SPRAY HAS DRIED. DON'T ALLOW SPRAY TO CONTACT FOOD/WATER SUPPLI ES.
 DON'T ALLOW USE BY SMALL CHILDREN WITHOUT CLOSE ADULT SUPERVIOSION.

===== Physical/Chemical Properties =====

Spec Gravity:0.792
 Solubility in Water:MISICIBLE
 Appearance and Odor:MILKY WHITE PRESSURIZED LIQUID W/MILD MOTHBALL-LIKE
 ODOR.
 Percent Volatiles by Volume:>40

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
 STRONG OXIDIZING AGENTS
 Stability Condition to Avoid:HEAT OR OPEN FLAME

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, &
FEDERAL REGULATIONS. CONTAINER DISPOSAL: REPLACE CAP, WRAP
CONTAINER IN SEVERAL LAYERS OF NEWSPAPER. DISCARD IN TRASH. DON'T
INCINERATE OR PUNCTURE.

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ASHLAND CHEMICAL COMPANY -- TRISODIUM PHOSPHATE -- 6810-01-082-5415

===== Product Identification =====

Product ID:TRISODIUM PHOSPHATE
 MSDS Date:08/05/1998
 FSC:6810
 NIIN:01-082-5415
 MSDS Number: CHQLP
 === Responsible Party ===
 Company Name:ASHLAND CHEMICAL COMPANY
 Box:2219
 City:COLUMBUS
 State:OH
 ZIP:43216-2219
 Country:US
 Info Phone Num:614-790-3333/800-325-3751
 Emergency Phone Num:800-274-5236 OR 800-ASHLAND
 CAGE:34897

===== Contractor Identification =====

Company Name:ASHLAND CHEMICAL CO
 Box:2219
 City:COLUMBUS
 State:OH
 ZIP:43216-2219
 Country:US
 Phone:614-790-3333/800-274-5263
 CAGE:34897
 Company Name:JEM SALES INC INCHEMCO DIV
 Address:430 LAVENDER DR
 Box:City:ROME
 State:GA
 ZIP:30165-2262
 Country:US
 Phone:706-232-1709
 CAGE:0AZD7

===== Composition/Information on Ingredients =====

Ingred Name:SODIUM PHOSPHATE, TRIBASIC (SARA III)
 CAS:10101-89-0
 RTECS #:TC9575000
 Fraction by Wt: 100%
 Other REC Limits:NONE SPECIFIED
 EPA Rpt Qty:5000 LBS
 DOT Rpt Qty:5000 LBS

===== Hazards Identification =====

LD50 LC50 Mixture:ORAL RAT LD50 IS 7400 MG/KG
 Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES
 Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
 Health Hazards Acute and Chronic:SODIUM PHOSPHATE IS SEVERLY IRRITATING
 TO BODY TISSUES, ESPECIALLY MOIST ONES SUCH AS THE MUCOUS
 MEMBRANES. DUSTS WILL IRRITATE THE UPPER RESPIRATORY TRACT CAUSING
 COUGHING.
 Explanation of Carcinogenicity:SODIUM PHOSPHATE IS NOT LISTED AS A
 CARCINOGEN BY IARC, NTP, OR OSHA.
 Effects of Overexposure:EYE:SEVERE IRRITATION. SKIN:IRRITATION,

POSSIBLE DERMATITIS. INHALED;RESPIRATORY
 IRRITATION,COUGHING,CHOKING,LARGE QUANTITIES MAY BE TOXIC.
 INGESTED:IRRITATION,BURNS OF MOUTH & THROAT. WILL PRODUCE NA
 USEA,VOMITING,DIARRHEA.

Medical Cond Aggravated by Exposure:NONE GIVEN BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:REMOVE
 CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE. WASH WITH SOAP &
 WATER. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING AS NEEDED.
 INGESTED:GIVE 2 LARGE GLASSES OF MILK OR WATER AND IMMEDIATELY
 INDUCE VOMITING. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. GET
 IMMEDIATE MEDICAL CARE.

===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
 Extinguishing Media:PRODUCT IS NON FLAMMABLE. EXTINGUISH FIRE WITH
 MEDIA APPROPRIATE FOR SOURCE OF FIRE.
 Fire Fighting Procedures:FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA &
 FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER
 SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
 Unusual Fire/Explosion Hazard:FIRE OR EXCESSIVE HEAT MAY CAUSE
 PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS.

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP,VACUUM OR OTHERWISE COLLECT, BEING
 CAREFUL NOT TO RAISE DUST. THEN FLUSH AREA WITH WATER.
 Neutralizing Agent:NONE

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY AREA, PROTECTED
 FROM MOISTURE. KEEP TIGHTLY CLOSED.
 Other Precautions:NONE

===== Exposure Controls/Personal Protection =====

Respiratory Protection:RESPIRATOR WILL NOT NORMALLY BE NECESSARY. USE
 NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR OR RESPIRATOR FOR
 DUST/MIST IF EXPOSURE IS ABOVE THE TLV/PEL. SEE 29 CFR 1910.134 FOR
 REGULATIONS PERTAINING TO RESPIRATOR USE.
 Ventilation:NORMAL ROOM VENTILATION IS SUFFICIENT. SUPPLEMENT WITH
 LOCAL EXHAUST IF PEL/TLV IS EXCEEDED.
 Protective Gloves:RUBBER,VINYL OR OTHER IMPERVIOUS
 Eye Protection:SAFETY GLASSES OR SPLASH GOGGLES
 Other Protective Equipment:SAFETY SHOWER AND EYE WASH STATION, WORK
 CLOTHING TO PROTECT AGAINST SKIN CONTACT.
 Work Hygienic Practices:USE GOOD CHEMICAL HYGIENE PRACTICE. AVOID
 UNNECESSARY CONTACT.
 Supplemental Safety and Health
 MANUFACTURER'S MSDS NO. 00004079-005.001

===== Physical/Chemical Properties =====

HCC:B3
 Spec Gravity:1.620 @ 68F
 pH:12

Appearance and Odor:WHITE CRYSTALLINE POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG ACIDS,IRON AND OTHER HEAVY METALS.
Stability Condition to Avoid:HEAT
Hazardous Decomposition Products:OXIDES OF PHOSPHORUS

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE I/A/W ALL FEDERAL, STATE AND LOCAL
REGULATIONS. MANUFACTURER MAKES NO SUGGESTION OF DISPOSAL METHOD.

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particular situation.

MSDS Number: **L2347** * * * * * *Effective Date: 09/15/09* * * * * * *Supersedes: 07/05/07*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

LEAD METAL

1. Product Identification

Synonyms: Granular lead, pigment metal; C.I. 77575

CAS No.: 7439-92-1

Molecular Weight: 207.19

Chemical Formula: Pb

Product Codes:

J.T. Baker: 2256, 2266

Mallinckrodt: 5668

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Lead	7439-92-1	95 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Ingestion:

POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Skin Contact:

Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact:

Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure:

Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.

Aggravation of Pre-existing Conditions:

Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For lead, metal and inorganic dusts and fumes, as Pb:

-OSHA Permissible Exposure Limit (PEL): 0.05 mg/m³ (TWA)

For lead, elemental and inorganic compounds, as Pb:

-ACGIH Threshold Limit Value (TLV): 0.05 mg/m³ (TWA), A3 animal carcinogen

ACGIH Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information).

For lead, inorganic:

-NIOSH Recommended Exposure Limit (REL): 0.1 mg/m³ (TWA)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025).

9. Physical and Chemical Properties

Appearance:

Small, white to blue-gray metallic shot or granules.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

11.34

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1740C (3164F)

Melting Point:

327.5C (622F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

1.77 @ 1000C (1832F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Does not decompose but toxic lead or lead oxide fumes may form at elevated temperatures.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylide, sodium acetylide and oxidants.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:

Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

Lead and other smelter emissions are human reproductive hazards. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981).

Carcinogenicity:

EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal evidence.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Lead (7439-92-1)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.
Lead (7439-92-1)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Lead (7439-92-1)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Lead (7439-92-1)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

WARNING:

THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **1** Reactivity: **0**

Label Hazard Warning:

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give

anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

SUPELCO INC -- 48499, INDENO (1,2,3-CD) PYRENE 10MG -- 6810-00N032522

===== Product Identification =====

Product ID:48499, INDENO (1,2,3-CD) PYRENE 10MG

MSDS Date:06/06/1985

FSC:6810

NIIN:00N032522

MSDS Number: BNSSK

=== Responsible Party ===

Company Name:SUPELCO INC

Address:SUPELCO PARK

City:BELLEFONTE

State:PA

ZIP:16823-0048

Country:US

Info Phone Num:814-359-3441

Emergency Phone Num:814-359-3441

CAGE:54968

=== Contractor Identification ===

Company Name:SIGMA-ALDRICH INC.

Address:3050 SPRUCE STREET

Box:14508

City:ST. LOUIS

State:MO

ZIP:63103

Country:US

Phone:314-771-5765/414-273-3850X5996

CAGE:54968

===== Composition/Information on Ingredients =====

Ingred Name:INDENO 1,2,3-CD PYRENE

CAS:193-39-5

RTECS #:NK9300000

EPA Rpt Qty:100 LBS

DOT Rpt Qty:100 LBS

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO

Health Hazards Acute and Chronic:REPORTED ANIMAL CARCINOGEN.

Explanation of Carcinogenicity:INDENO(1,2,3-CD) PYRENE: GROUP 2B(IARC),
ANTICIPATED TO BE CARCINOGEN (NTP).

Effects of Overexposure:NONE SPECIFIED BY MANUFACTURER.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. SKIN: FLUSH WITH
LARGE VOLUMES OF WATER. REMOVE CONTAMINATED CLOTHING. INHAL: MOVE
TO FRESH AIR. IF BREATHING STOPS, GIVE ARTF RESP. INGEST: IMMED
CONTACT A PHYSICIAN.

===== Fire Fighting Measures =====

Flash Point:400F,204C

Extinguishing Media:CO2, DRY CHEMICAL.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN SEALED CONTR IN COOL, DRY
LOCATION. KEEP AWAY FROM OXIDIZERS. STORE IN DRY, WELL VENTILATED
AREA.

Other Precautions:REPORTED CANCER HAZARD. AVOID EYE OR SKIN CONTACT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

Ventilation:USE ONLY IN EXHAUST HOOD.

Protective Gloves:NEOPRENE GLOVES.

Eye Protection:CHEMICAL WORKERS GOGGLES .

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:T6

Melt/Freeze Pt:M.P/F.P Text:324F,162C

Vapor Pres:0.10

Appearance and Odor:YELLOW CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS. METALLIC SODIUM & POTASSIUM.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR
LOCAL REGULATIONS.

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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

SUPELCO INC -- 48574, DIBENZO (A,H) ANTHRACENE 0.1G -- 6810-00N032523

===== Product Identification =====

Product ID:48574, DIBENZO (A,H) ANTHRACENE 0.1G
 MSDS Date:12/19/1985
 FSC:6810
 NIIN:00N032523
 MSDS Number: BNSSL
 === Responsible Party ===
 Company Name:SUPELCO INC
 Address:SUPELCO PARK
 City:BELLEFONTE
 State:PA
 ZIP:16823-0048
 Country:US
 Info Phone Num:814-359-3441
 Emergency Phone Num:814-359-3441
 CAGE:54968
 === Contractor Identification ===
 Company Name:SIGMA-ALDRICH INC.
 Address:3050 SPRUCE STREET
 Box:14508
 City:ST. LOUIS
 State:MO
 ZIP:63103
 Country:US
 Phone:314-771-5765/414-273-3850X5996
 CAGE:54968

===== Composition/Information on Ingredients =====

Ingred Name:DIBENZ A,H ANTHRACENE
 CAS:53-70-3
 RTECS #:HN2625000
 EPA Rpt Qty:1 LB
 DOT Rpt Qty:1 LB

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
 Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
 Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
 Health Hazards Acute and Chronic:REPORTED ANIMAL CARCINOGEN.
 Explanation of Carcinogenicity:DIBENZ(A,H) ANTHRACENE: GROUP 2A(IARC),
 ANTICIPATED TO BE CARCINOGEN (NTP).
 Effects of Overexposure:NONE SPECIFIED BY MANUFACTURER.
 Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. CONTACT A
 PHYSICIAN. SKIN: FLUSH WITH LARGE VOLUMES OF WATER. CONTACT A
 PHYSICIAN. INHAL: IMMED MOVE TO FRESH AIR. INGEST: CONTACT A
 PHYSICIAN.

===== Fire Fighting Measures =====

Lower Limits:1%

Extinguishing Media:WATER, CO2, DRY CHEMICAL.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN SEALED CONTAINER IN COOL, DRY
LOCATION. AVOID GENERATING DUST.
Other Precautions:REPORTED CANCER HAZARD. AVOID EYE OR SKIN CONTACT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED SCBA.
Ventilation:USE ONLY IN WELL VENTILATED AREA.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:T6
Boiling Pt:B.P. Text:509F,265C
Vapor Density:9.60
Spec Gravity:>1(H2O=1)
Appearance and Odor:OFF-WHITE TO YELLOW-GREEN CRYSTALLINE

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR
LOCAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Chrysene, 98%

ACC# 95251

Section 1 - Chemical Product and Company Identification

MSDS Name: Chrysene, 98%**Catalog Numbers:** AC224140000, AC224140010, AC224140050, AC224145000**Synonyms:** 1,2-Benzophenanthrene; Benzo(a)phenanthrene; 1,2,5,6-Dibenzonaphthalene.**Company Identification:**

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01**For emergencies in the US, call CHEMTREC:** 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
218-01-9	Chrysene	98	205-923-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: very light beige solid.

Caution! May cause eye and skin irritation. May cause respiratory tract irritation. May cause cancer in humans.**Target Organs:** Liver, skin.**Potential Health Effects****Eye:** May cause eye irritation.**Skin:** May cause skin irritation.**Ingestion:** May cause gastrointestinal irritation with nausea, vomiting and diarrhea.**Inhalation:** May cause respiratory tract irritation.**Chronic:** May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.**Skin:** Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.**Ingestion:** Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air

immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chrysene	0.2 mg/m ³ TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m ³ TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches). 80 mg/m ³ IDLH (listed under Coal tar pitches).	0.2 mg/m ³ TWA (benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Chrysene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: very light beige

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 448 deg C @ 760 mm Hg

Freezing/Melting Point: 250-255 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: C₁₈H₁₂

Molecular Weight: 228.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 218-01-9: GC0700000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

- **California:** carcinogen, initial date 1/1/90
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Chrysene was mutagenic to *S. Typhimurium* in the presence of an exogenous metabolic system.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified Fish toxicity : LC50 (96hr) *Neaethes arenacedentata* >1ppm.(Rossi,S.S. et al Marine Pollut. Bull. 1978) Invertebrate toxicity : lethal treshold concentration (24hr) *Daphnia Magna* 0,7æg/l.(* Newsted,J.L. et al Environ. Toxicol. Chem. 1987) Bioaccumulation : 24hr *Daphnia Magna* log bioconcentration factor 3.7845 (*)

Environmental: Degradation studies : biodegraded by white rot fungus (Proc.Annu.Meet.Am.Wood-Preserv.Assoc.1989) May be utilised by axenic cultures of microorganisms e.g. *Pseudomonas pancimobilis* EPA505, which may have novel degradative systems(Mueller,J.G. et al ppl.Environ.Microbiol.1990; Mueller, J.G. et al Environ.Sci.Technol.1991).

Physical: Not found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 218-01-9: waste number U050.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 218-01-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Chrysene (CAS# 218-01-9, 98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chrysene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 218-01-9: 0.35 æg/day NSRL (oral)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

- S 53 Avoid exposure - obtain special instructions before use.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: No information available.

Canada - DSL/NDSL

CAS# 218-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information
--

MSDS Creation Date: 6/30/1999

Revision #5 Date: 11/20/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

BENZO(B)FLUORANTHENE

Benzo(e)acephenanthrylene

2,3-Benzofluoroanthene

C₂₀H₁₂

Molecular mass: 252.3

CAS # 205-99-2

RTECS # CU1400000

ICSC # 0720

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
• EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Wear protective gloves when inducing vomiting. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Tightly closed.	Unbreakable packaging; put breakable packaging into closed unbreakable container.	
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0720	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993		

International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW CRYSTALS.</p> <p>PHYSICAL DANGERS:</p> <p>CHEMICAL DANGERS: Upon heating, toxic fumes are formed.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol and through the skin.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is possibly carcinogenic to humans.</p>		
PHYSICAL PROPERTIES	Melting point: 168°C Solubility in water: none	Vapour pressure, Pa at 20°C: <10 Octanol/water partition coefficient as log Pow: 6.04		
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.			
NOTES				
Depending on the degree of exposure, periodic medical examination is indicated. Data are insufficiently available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home.				
ADDITIONAL INFORMATION				
<table border="1" style="width: 100%; height: 20px;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> </table>				
ICSC: 0720		BENZO(B)FLUORANTHENE		
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Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%**Catalog Numbers:** AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000**Synonyms:** 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.**Company Identification:**

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01**For emergencies in the US, call CHEMTREC:** 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.

Danger! May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause allergic skin reaction. May cause heritable genetic damage.

Target Organs: Reproductive system, skin.**Potential Health Effects****Eye:** May cause eye irritation.**Skin:** May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.**Ingestion:** May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.**Inhalation:** May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.**Chronic:** May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).
----------------	---	---	--

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow to brown

Odor: faint aromatic odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 495 deg C @ 760 mm Hg

Freezing/Melting Point:175 - 179 deg C

Decomposition Temperature:Not available.

Solubility: 1.60x10⁻³ mg/l @25°C

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₁₂

Molecular Weight:252.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 50-32-8: DJ3675000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans. Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:		9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: immediate, delayed.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65**The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:**

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 50-32-8: 0.06 æg/day NSRL

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

R 43 May cause sensitization by skin contact.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 60 May impair fertility.

R 61 May cause harm to the unborn child.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

- S 53 Avoid exposure - obtain special instructions before use.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 50-32-8: No information available.

Canada - DSL/NDSL

CAS# 50-32-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information
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MSDS Creation Date: 9/02/1997

Revision #7 Date: 6/30/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

BENZ(a)ANTHRACENE

1,2-Benzoanthracene

Benzo(a)anthracene

2,3-Benzphenanthrene

Naphthanthracene

C₁₈H₁₂

Molecular mass: 228.3

CAS # 56-55-3

RTECS # CV9275000

ICSC # 0385

EC # 601-033-00-9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES		Safety goggles, face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Well closed.	T symbol R: 45 S: 53-45	

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

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International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW-BROWN FLUORESCENT FLAKES OR POWDER.</p> <p>PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.</p> <p>CHEMICAL DANGERS:</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is probably carcinogenic to humans.</p>
	<p>PHYSICAL PROPERTIES</p>	<p>Sublimation point: 435°C Melting point: 162°C Relative density (water = 1): 1.274</p>
ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in seafood.	
NOTES		
This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetrachene is a common name.		
ADDITIONAL INFORMATION		
ICSC: 0385		BENZ(a)ANTHRACENE
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**IMPORTANT
LEGAL
NOTICE:**

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International Chemical Safety Cards

BENZO(K)FLUORANTHENE

ICSC: 0721

BENZO(K)FLUOROANTHENE 11,12-Benzofluoroanthene Dibenzo(b,j,k)fluorene $C_{20}H_{12}$ Molecular mass: 252.3 CAS # 207-08-9 RTECS # DF6350000 ICSC # 0721			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
• SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
• EYES		Safety goggles or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Wear protective gloves when inducing vomiting. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.		Provision to contain effluent from fire extinguishing. Separated from strong oxidants. Tightly closed.	
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0721		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

BENZO(K)FLUORANTHENE

ICSC: 0721

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: YELLOW CRYSTALS.	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol and through the skin.
	PHYSICAL DANGERS:	INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.
	CHEMICAL DANGERS: Upon heating, toxic fumes are formed. Reacts with strong oxidants.	EFFECTS OF SHORT-TERM EXPOSURE:
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.	EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 215.7°C	Solubility in water: none Octanol/water partition coefficient as log Pow: 6.84
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.	
NOTES		
Data are insufficiently available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home.		
ADDITIONAL INFORMATION		
ICSC: 0721		BENZO(K)FLUORANTHENE
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MSDS Number: **A7441** * * * * * *Effective Date: 05/26/09* * * * * * *Supercedes: 08/17/06*



From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ARSENIC, 1,000 UG/ML OR 10,000 UG/ML

1. Product Identification

Synonyms: None

CAS No.: Not applicable to mixtures.

Molecular Weight: Not applicable to mixtures.

Chemical Formula: Not applicable to mixtures.

Product Codes: 5704, 5718, 6442

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Arsenic	7440-38-2	0.1 - 1%	Yes
Nitric Acid	7697-37-2	< 4%	Yes
Water	7732-18-5	> 95%	No

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison. The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

Inhalation:

Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract. Arsenic may cause inflammation of the mucous membranes with cough and foamy sputum, restlessness, dyspnea, cyanosis, and rales. Symptoms like those from ingestion exposure may follow. May cause pulmonary edema.

Ingestion:

Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. Arsenic is highly toxic! May cause burning in esophagus, vomiting, and bloody diarrhea. Symptoms of cold and clammy skin, low blood pressure, weakness, headache, cramps, convulsions, and coma may follow. May cause damage to liver and kidneys. A suspected fetal toxin. Death may occur from circulatory failure. Estimated lethal dose 120 milligrams.

Skin Contact:

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid. Arsenic on repeated or prolonged skin contact may cause bronzing of the skin, edema, dermatitis, and lesions. Repeated or prolonged inhalation of dust may cause damage to the nasal septum. Chronic exposure from inhalation or ingestion may cause hair and weight loss, a garlic odor

to the breath and perspiration, excessive salivation and perspiration, central nervous system damage, hepatitis, gastrointestinal disturbances, cardiovascular damage, and kidney and liver damage. Arsenic compounds are known human carcinogens and may be teratogenic based on effects in laboratory animals.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance. First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not require these extensive first aid procedures.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If swallowed, give large quantities of water to drink and get medical attention immediately. Never give anything by mouth to an unconscious person.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this substance.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

If emesis is unsuccessful after two doses of Ipecac, consider gastric lavage. Monitor urine arsenic level. Alkalinization of urine may help prevent disposition of red cell breakdown products in renal tubular cells. If acute exposure is significant, maintain high urine output and monitor volume status, preferably with central venous pressure line. Abdominal X-rays should be done routinely for all ingestions. Chelation therapy with BAL, followed by n-penicillamine is recommended, but specific dosing guidelines are not clearly established.

5. Fire Fighting Measures

Fire:

Not combustible, but concentrated material is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Explosion:

Concentrated material reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive

mixtures with air.

Fire Extinguishing Media:

If involved in a fire, use water spray.

Special Information:

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Nitric Acid:

OSHA Permissible Exposure Limit (PEL):

2 ppm (TWA)

ACGIH Threshold Limit Value (TLV):

2 ppm (TWA); 4 ppm (STEL)

For Inorganic Arsenic compounds (as As):

- OSHA Permissible Exposure Limit (PEL):

10 ug/m³ (TWA), 5 ug/m³(Action Level), cancer hazard.

- ACGIH Threshold Limit Value (TLV):

0.01 mg/m³ (TWA), A1, confirmed human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Canister-type respirators using sorbents are ineffective.

Skin Protection:

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Any area where inorganic arsenic is stored, handled, used, etc., must be established as a 'Regulated Area' with controlled access, limited to authorized persons. Containers of inorganic arsenic and Regulated Areas must be labeled to show a CANCER SUSPECT AGENT is present. Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing arsenic or lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (arsenic: 29 CFR 1910.1018; lead: 29 CFR 1910.1025).

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Odorless.

Solubility:

Infinitely soluble.

Specific Gravity:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

> 99

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Emits toxic fumes of arsenic when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

Conditions to Avoid:

Heat, incompatibles.

11. Toxicological Information

Toxicological Data:

For arsenic: oral rat LD50: 763 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector. For Nitric Acid: Investigated as a mutagen and reproductive effector.

Carcinogenicity:

For arsenic and inorganic arsenic compounds:

Regulated by OSHA as a carcinogen.

EPA / IRIS classification: Group A - Known human carcinogen.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Arsenic (7440-38-2)	Yes	No	1
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)
-----**Proper Shipping Name:** CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)**Hazard Class:** 8**UN/NA:** UN3264

Packing Group: III

Information reported for product/size: 150ML**International (Water, I.M.O.)**
-----**Proper Shipping Name:** CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)**Hazard Class:** 8**UN/NA:** UN3264

Packing Group: III

Information reported for product/size: 150ML**International (Air, I.C.A.O.)**
-----**Proper Shipping Name:** CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)**Hazard Class:** 8**UN/NA:** UN3264

Packing Group: III

Information reported for product/size: 150ML

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil.
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Arsenic (7440-38-2)	No	No	Yes	Arsenic comp
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Arsenic (7440-38-2)	1	No	No
Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Mixture / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL

BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:

- Do not get in eyes, on skin, or on clothing.
- Do not breathe vapor or mist.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Keep container closed.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDSs/SAFETY CARDS CONTAINED IN THIS APPENDIX

Contaminants of Concern

Semi-Volatile Organic Compounds

Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(K)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Indeno(123-cd)pyrene

Metals

Arsenic
Lead
Mercury

Materials Brought to Site

Alconox [®]	Antifreeze
Bentonite	DEET
Diesel fuel	Gasoline (unleaded)
Hydrochloric Acid	Isobutylene (isobutene)
Motor Oil	Nitric Acid
Nitrogen	Portland Cement
Permanone [®]	Trisodium Phosphate

APPENDIX C
OSHA INFORMATION POSTER

Job Safety and Health

It's the law!

OSHA

Occupational Safety and Health Administration
U.S. Department of Labor

EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health



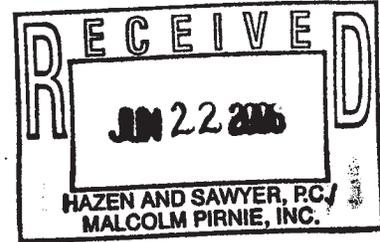
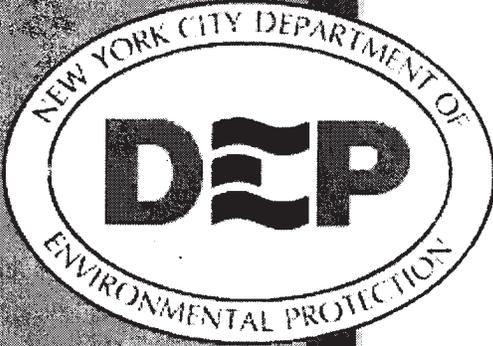
Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

ATTACHMENT 1
NYSDEC SPILL PROCEDURES

CMJV **FILE COPY**

CM Chrono



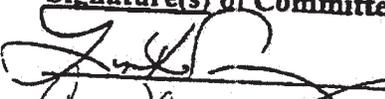
THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL, HEALTH & SAFETY POLICIES AND PROCEDURES

Vol. 2
Spill Prevention, Environmental Release
Reporting & Investigation

Environmental Coordination Committee Approval

The New York City Department of Environmental Protection's Environmental Coordination Committee has reviewed this document and by signing below agree that it adequately defines the program necessary to address regulatory requirements for their Bureau operations and commit to the policies and/or procedures contained within (or substantially equivalent procedures, if Bureau specific amendment is required).

<u>Revision / Action</u>	<u>Signature(s) of Committee Chair</u>	Date:
<u>Revision 0. Authorization</u>		<u>08/22/02</u>
<u>Revision 1. Authorization</u>	<u>Lynn Marie Byrnes</u>	<u>10/29/04</u>
<u>Revision 2. Authorization</u>	<u>Christi Tancin</u>	<u>03/31/06</u>
_____	_____	Date: _____

Agency Compliance Office Certification

I, a duly authorized representative of the DEP Agency Compliance Office, have reviewed this document, have found it to be acceptable and authorize its use for all DEP operations.

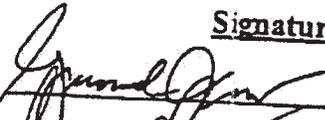
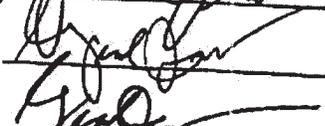
<u>Revision / Action</u>	<u>Signature(s)</u>	Date:
<u>Revision 0. Authorization</u>		<u>8/22/02</u>
<u>Revision 1. Authorization</u>		<u>10/29/04</u>
<u>Revision 2. Authorization</u>		<u>3/31/06</u>
_____	_____	Date: _____

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1 Purpose

The purpose of this procedure is to prevent releases when possible and to ensure that all incidents that result in spills of petroleum, hazardous substances, wastewater/sewage or other pollutants are properly reported, both within DEP and to appropriate regulatory agencies. In an emergency, facility Emergency Action/Response Plans or Contingency Plans are the primary reference for immediate action. Actions necessary to protect life and health are the first priority in any emergency.

2 Scope

This procedure applies to all releases of petroleum, hazardous substances, wastewater/sewage or other pollutants on DEP property or at field work locations, whether or not caused by DEP activities or those of its contractors. This procedure does not apply to transportation accidents or other releases caused by third parties unrelated to DEP water or wastewater operations in New York City or its watersheds, although DEP may respond to these incidents as part of its water supply protection and City Hazmat technical support roles. This procedure also does not apply to routine self-reporting required under established permits.

3 Responsibilities

The following responsibilities generally apply throughout DEP, although Bureaus and individual facilities may develop more detailed Manuals and Emergency Plans that can deviate from these responsibilities. This is acceptable as long as responsibilities are clearly assigned:

Employee: It is the responsibility of all employees to prevent releases when possible and to immediately report any release of petroleum, a hazardous substance, wastewater/sewage or other pollutant, as described in the procedure below.

Responsible Manager: The highest ranking manager or supervisor within each DEP Bureau at each facility (or whose employees perform field operations outside of fixed facilities) is the "**Responsible Manager**" for that Bureau/Office's operation. The **Responsible Manager** must make the necessary calls to Division/Bureau management and Division/Bureau EH&S staff for assistance and must cooperate in reporting and investigation.

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Contract Supervisor: The senior staff person overseeing a remediation project will be referred to as the “***Contract Supervisor.***” ***Contract Supervisor*** has many definitions, depending on the Contract and/or managing Bureau:

- For contracts managed by BEDC Design, the ***Contract Supervisor*** is the Lead Project Engineer;
- For contracts managed by BEDC Construction, the ***Contract Supervisor*** is the DEP Resident Engineer, or the DEP employee directly responsible for overseeing the consultant Resident Engineer when a Construction Manager (CM) is responsible for resident engineering;
- For contracts managed by various BWS divisions, the ***Contract Supervisor*** is the Director of the Division who hired the Contractor or his/her designee (e.g., Project Manager); and
- For contracts managed by BWSO, the ***Contract Supervisor*** is the BWSO Manager (Director, Chief, Deputy Chief, etc.) responsible for managing and overseeing the contract or his/her designee (e.g., Project Manager).

National Response Center: The National Response Center (NRC) maintains a 24 hour per day, 7 day a week, 365 day a year Operations Call Center where all information is received via a toll-free number, entered directly into an on-line data base system, and electronically disseminated as part of the National Response System.

NRC is the single contact point for reporting all pollution incidents. It acts as a national 911 service for environmental incidents. Calling the toll-free number fulfills nearly all federal requirements for reporting oil and chemical spills, spills of nuclear material, chemical and biological warfare agents, train derailments, and pipeline spills.

The following are examples of incidents that warrant a call to the NRC:

Oil Spills: The responsible party shall notify the NRC as soon as he becomes aware of an oil spill from a vessel or facility operating *in or along U.S. navigable waters.*

Chemical Spills: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that all spills of hazardous substances (including radionuclides) exceeding reportable quantities, be reported by the responsible party to the NRC.

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Transportation Accidents: Transportation accidents involving hazardous materials, including radioactive substances, must be reported to the NRC immediately by the carrier when, as a direct result of the materials: a person is killed; a person receives injuries requiring hospitalization; property damage exceeds \$50,000; or fire, breakage, or spillage of an etiologic agent occurs.

4 Spill Prevention

A large portion of DEP spills are a result of improperly maintained or damaged equipment. Equipment includes, but is not limited to, vehicles, construction equipment, pumps, meters, storage tanks, etc. **Responsible Managers** must prevent spills within their respective facility/work group by employing the following measures, where/when applicable:

- Utilizing checklists to conduct pre-use inspections of equipment;
- Emphasizing proper materials handling and container storage inspection practices;
- Using manufacturer recommended Maintenance Procedures (MPs) to develop in-house MPs for certain types of equipment or activities where there is no adequate preventive maintenance (PM) schedule in place. If neither exists, the facility shall develop equipment-specific MPs;
- Using breakaway or quick disconnect hoses and/or absorbent drip pads during product or fuel transfer and dispensing activities;
- Ensuring the proper labeling of valves and ports transferring or receiving chemical or petroleum products;
- Installing secondary containment devices (e.g., drip pans) on equipment;
- Scheduling replacement of damaged or old equipment; and
- Utilizing any other appropriate spill prevention measures.

The following sections describe the specific procedures to be followed for handling spills that occur within the Bureau of Water Supply (BWS), Bureau of Water & Sewer Operations (BWSO), Bureau of Wastewater Treatment (BWT), and Bureau of Engineering Design & Construction (BEDC).

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5 Bureau of Water Supply (BWS) - Protocol for Reporting Spills/Releases

5.1 Initial Notification

Upon discovery of a spill/release, any DEP Employee or DEP Contractor (the "Discoverer") who becomes aware of any spill/release of a petroleum product, sewage and/or wastewater, hazardous substance, or other pollutant that occurs on DEP property or may potentially impact the DEP watershed/water supply shall:

- Immediately notify Supervisors/Co-workers, if they are or may be in IMMEDIATE DANGER;
- If medical attention is required, contact Emergency 911;
- **Immediately contact their respective Supervisor and *EH&S staff member* on duty to determine if the spill is at or above the NYSDEC reportable quantity; AND**
- **Immediately call the BWS DEP Police Croton Command Center (CCC) at 888-426-7433* and provide as much of the information below as possible:**
 - Location of incident;
 - Time of incident;
 - Material released;
 - Status of staff (injuries, if any);
 - Name, position, and contact information of "discoverer";
 - Duration and estimated quantity of material released; and
 - Estimated impact to the environment and site weather conditions; AND
 - Whether or not the spill is at or above the NYSDEC *reportable quantity* and requires that DEP Police call NYSDEC for a Spill Number – **There is a 2-hour time limit to make this determination and contact NYSDEC.**
- **Except for:**

Incidental releases of hazardous substances or petroleum. These are releases of small quantities, such as a few ounces, that result from equipment maintenance, repair or leakage, which have impacted only an impervious surface. Only releases which are contained and collected before reaching the environment (land or waters of the State of New York) would fall under this definition.

***BWS personnel working IN CITY:** BWS personnel working IN CITY (i.e., DWQC personnel based in Queens, New York) are directed to **call the BWSO EHS On-Call phone number (646-879-3315) instead of the Croton Command Center** as indicated above.

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BWS Wastewater Treatment Plant Operators: In addition to the aforementioned notification requirements, ALL BWS Wastewater Treatment Plant (WWTP) Operators must report all wastewater/sewage releases as directed by the facility's respective State Pollutant Discharge Elimination Systems (SPDES) permit(s) to NYSDEC directly as mandated by **6 NYCRR Subpart 750-2.7 Incident Reporting**. These reporting requirements may include, but not be limited to, Anticipated Non-Compliance, 2-Hour Oral reporting of By-pass, Upset or Other Incident, 24-Hour Oral reporting of Bypass, Upset or Other Incident, 5 Day Written Incident Report and any additional reporting as required under the facility-specific issued SPDES Permit.

5.2 Role of BWS DEP Police Croton Command Center (CCC)

Upon notification of a spill/release by the Discoverer or participating Division **EH&S staff member**, **AND NO LATER THAN 2-HOURS FROM INITIAL DISCOVERY**, the CCC is responsible for:

- Contacting NYSDEC, if the spill is at or above the NYSDEC *reportable quantity*, to relay spill/release information provided by the Discoverer or participating **EH&S staff member** and obtaining a Spill Number (IF issued by NYSDEC);
- If needed, dispatching BWS HazMat, Engineering (for spills of sewage and/or wastewater), BWS DEP Police, and/or any additional local authorities for emergency response; and
- If required, contacting the National Response Center (NRC) at (800) 424-8802.

5.3 Environmental Release Investigation – PART 1 of the ERR

For all spills/releases (except “incidental” releases), and after contacting the CCC [or the BWSO EHS On-Call phone number (646-879-3315) if working IN CITY], the Discoverer and/or participating Division **EH&S staff member** must:

- Complete PART 1 of the Environmental Release Report (ERR – Attachment A) **no later than 48 hours from initial discovery**, and fax to Bureau EH&S at (914) 773-4530; the CCC [or the 24-hour DEP On-Call phone number if working IN CITY] shall provide the assigned Spill Number (IF provided by NYSDEC), to be included in PART 1 of the ERR.

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5.4 Environmental Release Investigation

After the initial notifications and any necessary emergency response efforts are completed, the participating Division *EH&S staff member* (with assistance from the Discoverer, if necessary) shall conduct the necessary investigation to properly complete applicable sections of PARTs 2 and 3 of the ERR. PARTs 2 and 3 of the ERR shall be completed no later than six (6) days after discovery of the spill/release, unless outstanding circumstances warrant additional time for investigation (i.e., sampling/remediation event). These Sections also applies to spills or releases of wastewater and/or sewage at BWS WWTPs.

5.5 Communicating Corrective Actions

When the investigation is complete, the participating Division *EH&S staff member* shall inform his/her respective *Division Director* of any spill prevention recommendations that require follow-up. It is the responsibility of the affected *Division Director* (or designee) to ensure that all recommendations are properly resolved and documented in the ERR. Whenever a recommendation is not or cannot be implemented, a written explanation shall be documented in PART 3 of the ERR (or attached to ERR). The ERR will not be "closed" until all recommendations are resolved and documented.

5.6 ERR Closure

The affected *Division Director* (or designee) and the Bureau E, H & S Director (or designee) shall periodically check the status of completion of all spill prevention recommendations until they are properly resolved and documented in the ERR, within six (6) days of initial spill/release discovery, unless outstanding circumstances warrant additional time for investigation (i.e., sampling/remediation event). Final and/or Closed ERRs shall then be transmitted to *Bureau EH&S (fax to 914-773-4530)* for tracking purposes.

5.7 Recordkeeping

Copies of all closed ERRs shall be maintained by *Division EH&S* and *Bureau EH&S* for a minimum of five (5) years. Records of any training provided to fulfill any recommendations shall also be maintained by *Division EH&S* for a minimum of five (5) years.

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6 Bureau of Water and Sewer Operations (BWSO) - Protocol for Reporting Spills/Releases

6.1 Initial Notification – Part 1 of the ERR

Any Employee or contractor who becomes aware of a release of petroleum, hazardous substance or other pollutant shall immediately notify:

- Supervisors/Co-workers, if they are or may be in IMMEDIATE DANGER.
- **Emergency (911)** IF the incident CLEARLY REQUIRES EMERGENCY RESPONDERS (because it presents obvious danger to employees or the public); If employee doesn't have access to a phone, notify a facility Supervisor.
- The **Responsible Manager** or highest ranking Supervisor on duty, REGARDLESS OF THE SIZE OF THE RELEASE or whether it is inside a containment area.

Upon being notified of a release, the facility Responsible Manager or highest ranking Supervisor on duty for the operation must immediately notify BWSO Bureau EHS staff verbally either during regular business hours (9:00 am to 5:00 pm Monday through Friday) or the on-call Bureau EHS representative (via the 24-hour On-Call phone number 1-646-879-3248) and the Emergency Communications Center (212-689-1620) after business hours for all spills, **except:**

Incidental releases of hazardous substances or petroleum. These are releases of small quantities, such as a few ounces, that result from equipment maintenance, repair or leakage, which have impacted only an impervious surface. As addressed in BWSO spill training, only releases which are contained and collected before reaching the environment would fall under this definition. This exception (incidental releases of hazardous substances and petroleum) only applies to immediate notification of BWSO Bureau EHS. The spill is still logged and tracked by the facility for report to Bureau EHS in a facility monthly incidental spill log. If there is any uncertainty about a spill falling into this category, then Bureau EHS must be contacted immediately.

For all other spill incidents, the initial notification **MUST BE MADE VERBALLY TO AN EHS STAFF MEMBER** in order to guarantee that there will be a timely response to the spill. A voice mail, e-mail or fax is **NOT** acceptable as an initial notification. Notification can be

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made to any BWSO EHS staff member, an Environmental or Health and Safety representative or the 24 hour On-Call representative. BWSO Bureau EHS maintains and distributes to its facilities an "EHS Contact List," which provides a list of all EHS employees and their contact numbers, for 24/7 support for releases or other emergencies.

Within **24 HOURS** of initial spill notification to Bureau EHS, the facility **Responsible Manager** must also provide Bureau EHS with Part 1 of the DEP Environmental Release Report (ERR - **Attachment A**) with as much of the information as is available, especially material released, quantity, and where the material was released.

6.2 Bureau EHS Assistance

The BWSO Bureau EHS staff is responsible for providing technical support to the facility to assess the release and, in most incidents, for notifying the appropriate regulatory agency, when required; for preparing and submitting written reports to NYSDEC (1-800-457-7362) and for leading incident investigations, should they be required.

Bureau EHS Staff will:

- Assess the release and assist the facility in release reporting (e.g., estimating the quantity of release) and cleanup.
- **DETERMINE IF REPORTABLE** (to outside agencies).
- If the release is reportable, **REPORT THE RELEASE** as soon as possible [within 2 hours] to the New York State Department of Environmental Conservation (NYSDEC) and, if situation warrants, "immediately" to the National Response Center (NRC). Be sure to get the NYSDEC and NRC spill numbers.
- If warranted, **ACTIVATE** emergency clean-up contractor's response teams to assist in the response and spill clean-up. BWSO Bureau EHS representatives will be on-site to supervise and direct the contractor's remediation efforts.

6.3 Environmental Release Investigation – Part 2 of the EER

After the initial notifications and any necessary emergency response are completed, Part 2 of the DEP ERR will be completed. As with Part 1, Part 2 can be completed by the **Responsible Manager** with as much information as available and must be submitted to Bureau EHS within 24 hours. The Bureau EHS Group and Facility EHS Liaison will assist in determining any contributing causes and potential corrective actions to prevent recurrence. This investigation

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by EHS should be initiated as soon as possible and no later than 48 hours after the discovery of the spill. The Deputy Commissioner, Director, and Bureau EHS Director shall be informed of all recommendations arising from the investigation. All recommendations will then be assigned by the *Director* to the appropriate staff (e.g., operations, maintenance, engineering, or contract personnel) for prompt follow-up.

6.4 Closeout of Spill Cases – PART 3 of the ERR

The Bureau EHS staff will periodically check the status of all open spill cases and implementation of any spill prevention recommendations until they are all properly resolved. When all actions regarding a spill have been completed, Part 3 of the ERR will be completed, with a copy of the report stored in Bureau EHS files and the affected facility files.

6.5 Communicating Results

All Contractor Representative(s) and DEP employees will be advised of any actions or new operating instructions resulting from the spill incident that may affect them as soon as they are to be implemented. The immediate Supervisor will review the incident investigation results and recommendations with all affected personnel during the next scheduled Safety Meeting. In addition, incident investigation findings will be communicated to all contract employees if relevant to their job tasks. All facility and contract personnel informed of investigation results must sign and date an attendance sheet.

6.6 Recordkeeping

Copies of all ERRs shall be maintained by Bureau EHS for a minimum of 5 years. Records (i.e., sign-in sheets and attached summaries) of any training program provided to fulfill spill prevention recommendations shall also be maintained by EHS for a minimum of 5 years.

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7 Bureau of Wastewater Treatment (BWT) - Protocol for Reporting Spills/Releases

7.1 Initial Notification

Any Employee who becomes aware of a release of petroleum, hazardous substance or other pollutants at a BWT facility shall immediately notify:

- Supervisors/Co-workers IF they may be or are in IMMEDIATE DANGER.
- **911** IF the incident CLEARLY REQUIRES EMERGENCY RESPONDERS (because it presents obvious danger to employees or the public).
- The **Responsible Manager** or highest ranking Supervisor on duty, REGARDLESS OF THE SIZE OF THE RELEASE or whether it is inside a containment area.

Upon being notified of a release, the facility **Responsible Manager** or highest ranking Supervisor on duty for the operation will immediately refer to the BWT Emergency Procedures Manual for guidance AND notify Bureau EHS staff during regular business hours (6:30 am to 4:00 pm Monday through Friday) or, when after business hours, the on-call Bureau EHS representative directly, for all releases. Bureau EHS will review the incident with the **Responsible Manager** and notify NYSDEC.

Additionally, Bureau EHS will notify the DEP 24 Hour Call Center (212-689-1520) for all releases, **except**:

Incidental releases of hazardous substances. Releases of small quantities that result from equipment maintenance, repair or leakage, or occur when disconnecting lines after deliveries. [Note: All such releases must be contained and collected before reaching the environment].

Minor releases of petroleum. Releases that are less than five gallons AND contained on a non-permeable surface AND are cleaned up within 2 hours.

Make sure to provide Bureau EHS and DEP 24 Hour Call Center with as much of the information on Part 1 of the DEP Environmental Release Report (ERR - **Attachment A**) as is already available, especially material released, quantity, and where the material was released.

Wastewater/sewage releases at BWT Facilities are to be reported as required in the BWT Emergency Procedures Manual, as indicated by the facility's State Pollutant Discharge

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Elimination System (SPDES) permit(s), as mandated by **6 NYCRR Subpart 750-2.7 Incident Reporting**. These reporting requirements may include, but are not limited to, Anticipated Non-Compliance, 2-Hour Oral Reporting of By-pass, Upset or Other Incident, 24-Hour Oral Reporting of Bypass, Upset or Other Incident, 5-Day Written Incident Report and any/all Additional Reporting as required by the facility-specific SPDES Permit.

Supervisors may be required to follow additional, internal DEP notification protocols and are directed to refer to their Emergency Procedures Manual.

7.2 Bureau EHS Assistance/Reporting

The Bureau EHS staff is responsible for providing technical support to the facility to assess the releases, for notifying the appropriate regulatory agencies when required (NYSDEC (1-800-457-7362) and NRC (800-424-8802)), and for participating in incident investigations, if necessary. Bureau EHS will maintain an "EHS On-call List" that provides a list of employees with contact numbers for 24/7 support for releases or other emergencies.

Bureau EHS Staff will:

- Assess the release and assist the facility in release reporting (e.g., estimating the quantity of release) and clean-up.
- Determine if DEP 24 Hour Call Center has been notified. If it is determined that the DEP 24 Hour Call Center should be notified and the facility has not yet done so, the Bureau EHS Staff will notify them.
- If the Bureau HazMat and/or emergency clean-up contractors have not already been mobilized, determine if they should be mobilized to assist in the response and **ACTIVATE RESPONSE TEAMS** if necessary.
- **DETERMINE IF REPORTABLE** (to outside agencies).
- If the release is reportable, **REPORT THE RELEASE** within 2 hours to NYSDEC and "immediately" to the NRC. Be sure to get the NYSDEC and NRC spill numbers.

7.3 Environmental Release Investigation – Part 2 of the ERR

When called for, or at the direction of the Bureau's EHS Representative, an incident investigation team will be established to investigate the incident. After the initial notifications and any necessary emergency response are completed, the incident will be investigated and Part 2 of the DEP ERR will be completed. The Bureau EHS Group and Facility EHS Liaison

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will assist in determining any contributing causes and potential corrective actions to prevent recurrence.

The investigation should be initiated as soon as possible and no later than 48 hours after the incident. Part 2 of the ERR should be completed as soon as possible, and no later than 6 days after the release so that it can be used by Bureau EHS Group for written spill reporting.

7.4 Closeout of Spill Cases – PART 3 of the ERR

The Bureau EHS staff will periodically check the status of all open spill cases and implementation of any spill prevention recommendations until they are all properly resolved. When all actions regarding a spill have been completed, Part 3 of the ERR will be completed, with a copy of the report stored in Bureau EHS files and the affected facility's files.

7.5 Communicating Results

All Contractor Representative(s) and DEP employees will be advised of any actions or new operating instructions that may affect them as soon as they are to be implemented. The immediate Supervisor will review the incident investigation results and recommendations with all affected personnel during the next scheduled Safety Meeting. In addition, incident investigation findings will be communicated to all contract employees if relevant to their job tasks. All facility and contract personnel informed of investigation results must sign and date an attendance sheet.

7.6 Recordkeeping

Copies of all ERR forms shall be maintained by Bureau EHS for a minimum of 5 years. Records (i.e., sign-in sheets and attached summaries) of any training program provided to fulfill spill prevention recommendations shall also be maintained by EHS for a minimum of 5 years.

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8 Bureau of Engineering, Design and Construction (BEDC) - Protocol for Reporting Spills/Releases

8.1 At Bureau of Water Supply (BWS) Sites

Upon discovery of a spill/release, **AND NO LATER THAN 2 HOURS FROM INITIAL DISCOVERY**, any DEP Employee or DEP Contractor (the "Discoverer") who becomes aware of **any** spill/release of a petroleum product, sewage and/or wastewater, hazardous substance, or other pollutant that occurs on DEP property or may potentially impact the DEP watershed/water supply shall:

- Immediately notify Supervisors/Co-workers, if they are or may be in IMMEDIATE DANGER;
- **If medical attention is required, contact Emergency 911;**
- Contact the *Contract Supervisor* or Designee (e.g., Resident Engineer) and provide as much of the information below as possible:
 - Location of incident;
 - Time of incident;
 - Material released;
 - Status of staff (injuries, if any);
 - Name, position, and contact information of "discoverer";
 - Duration and estimated quantity of material released; and
 - Estimated impact to the environment and site weather conditions.

The **Contract Supervisor** shall continue as follows:

- Call the **BWS DEP Police Croton Command Center (CCC) at 888-426-7433**; inform the CCC that the appropriate notifications (including the call to NYSDEC) are being handled by BEDC personnel;
- Call the Safety Consultant's 24 hour hotline;
- Call the Facility Responsible Manager and BWS Bureau EHS (914-773-4418);
- In coordination with the Safety Consultant's on-call representative and Bureau EHS (BEDC), determine if the Spill/Release is reportable to NYSDEC and NRC (if applicable);
- Call NYSDEC spill hotline at 800-457-7362 (and NRC, if applicable) and obtain spill number(s); if reportable, NYSDEC must be notified **NO LATER THAN 2 HOURS FROM THE INITIAL DISCOVERY**;

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- In coordination with the “Discoverer” and BWS Bureau EHS, **complete PART 1 of the Environmental Release Report (ERR – Attachment A) as soon as possible** and fax to BWS *Bureau EHS* at (914) 773-4530;
- E-mail PART 1 of the ERR to the contact list below:
 - To: Deputy Commissioner of BEDC
 - Cc: Commissioner; First Deputy Commissioner; Chief of Staff; General Counsel; Press Office; Office of EHS Compliance; Human Resources; DEP Police; BEDC Directors; Appropriate BEDC Division Chiefs; Bureau EHS Representative; Safety Consultant;
- Fax PART 1 of the ERR to the *DEP Division of Emergency Response and Technical Assessment* at 718-595-4690 if hazardous materials are involved.

Notes:

- Refer to BEDC’s latest *Spill/Release Notification Protocol* for names and contact information.
- The *Contract Supervisor* may delegate the above tasks to the consultant Resident Engineer if she/he is not present on the job site.
- All spills/releases must be reported at facilities with BEDC-managed contracts, regardless of reportable quantities.

8.2 All other Sites (Non-BWS Sites)

Upon discovery of a spill/release, **AND NO LATER THAN 2 HOURS FROM INITIAL DISCOVERY**, any DEP Employee or DEP Contractor (the “Discoverer”) who becomes aware of any spill/release of a petroleum product, sewage and/or wastewater, hazardous substance, or other pollutant that occurs on DEP property or may potentially impact the DEP water supply shall:

- Immediately notify Supervisors/Co-workers, if they are or may be in IMMEDIATE DANGER;
- **If medical attention is required, contact Emergency 911;**
- Contact the **Contract Supervisor or Designee (e.g., Resident Engineer)** and provide as much of the information below as possible:
 - Location of incident;
 - Time of incident;
 - Material released;

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- Status of staff (injuries, if any);
- Name, position, and contact information of “discoverer”;
- Duration and estimated quantity of material released; and
- Estimated impact to the environment and site weather conditions.

The **Contract Supervisor** will continue as follows:

- Call the Safety Consultant’s 24 hour hotline;
- Call the Facility Responsible Manager;
- In coordination with the Safety Consultant’s on-call representative and Bureau EHS (BEDC), determine if the Spill/Release is reportable to NYSDEC and NRC;
- If reportable, call NYSDEC spill hotline at 800-457-7362 and NRC and obtain spill number(s). NYSDEC must be notified **NO LATER THAN 2 HOURS FROM the INITIAL DISCOVERY**;
- If hazardous materials are involved and spill incident warrants it, call DEP Division of Emergency Response and Technical Assessment at 718-595-4646;
- In coordination with the “Discoverer” and facility Responsible Manager, **complete PART 1 of the ERR as soon as possible**;
- E-mail PART 1 of the ERR to the contact list below:
 - To: Deputy Commissioner of BEDC
 - Cc: Commissioner; First Deputy Commissioner; Chief of Staff; General Counsel; Press Office; Office of EHS Compliance; Human Resources; DEP Police; BEDC Directors; Appropriate BEDC Division Chiefs; Bureau EHS Representative; Safety Consultant;
- Fax PART 1 of the ERR to the *DEP Division of Emergency Response and Technical Assessment* at 718-595-4690 if hazardous materials are involved.

Notes:

- Refer to BEDC’s latest *Spill/Release Notification Protocol* for names and contact information.
- The **Contract Supervisor** may delegate the above tasks to the consultant Resident Engineer if she/he is not present on the job site.
- All spills/releases must be reported at facilities with BEDC-managed contracts, regardless of reportable quantities.

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8.3 Environmental Release Investigation – PART 2 of the ERR

If required, form an investigation team in accordance with the Spill Prevention and Spill Reporting Policy. The *Contract Supervisor*, Host Bureau, Bureau EHS and/or their representatives and the contractor responsible for the Spill/Release shall be included as part of the investigation

When the clean-up operation is completed, complete the remainder of the ERR. Make sure that all members of the investigation team agree and sign the ERR.

8.4 Closeout of Spill Cases – PART 3 of the ERR

If applicable, in coordination with Bureau EHS, contact NYSDEC and request the closure of the spill number. Indicate spill number closure date on page 3 of the ERR.

Submit the completed form to Bureau EHS for review and Close-Out. Bureau EHS will provide a copy of the closed-out report to the *Contract Supervisor* (e.g., Resident Engineer), the Host Bureau's Responsible Manager and EHS group, Office of Environmental Health and Safety Compliance (OEHSC) and Division of Emergency Response and Technical Assessment.

8.5 Communicating Corrective Actions

Once the investigation is complete, the *Contract Supervisor* shall inform their respective Division Director and Division EHS personnel of all spill prevention recommendations, if any, that require follow-up. It is the responsibility of the Division Director (or designee) to ensure that all recommendations are properly resolved and documented in the ERR. Whenever a recommendation is not or cannot be implemented, a written explanation shall be documented in PART 3 of the ERR (or attached to ERR). The ERR will not be "closed" until all recommendations are resolved and documented.

8.6 Recordkeeping

Copies of all closed ERR forms shall be maintained by Division EHS for a minimum of 5 years. Records of any training provided to fulfill any spill prevention recommendations in PART 2 of the ERR shall also be maintained by Division EH&S for a minimum of 5 years.

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9 FLEET Maintenance Personnel (Bureau of Human Resources and Administration; HRA) - Protocol for Reporting Spills/Releases

9.1 FLEET Maintenance Personnel working Upstate (within BWS Boundaries)

FLEET Maintenance personnel working within the boundaries of the Bureau of Water Supply are directed to report spills/release as directed by Sections 5.1 and 5.3. The *FLEET Maintenance Supervisor* is responsible for conducting the necessary investigation required to complete PART 2 of the Environmental Release Report (ERR – Attachment A), communicating corrective actions with *BWS Bureau EH&S*, and providing copies of the closed ERR (ERR PARTs 1 through 3) to *BWS Bureau EH&S* (fax to: 914-773-4530). ERRs are to be closed no later than six (6) days after discovery of the spill/release, unless outstanding circumstances warrant additional time for investigation (i.e., sampling/remediation event). Copies of all closed ERR forms shall be maintained by *FLEET Maintenance EH&S* and *BWS Bureau EH&S* for a minimum of five (5) years.

9.2 FLEET Maintenance Personnel working In-City

FLEET Maintenance personnel working In-City (within the boundaries of the five NYC boroughs) are directed to report all spills/release as directed by Section 6.1, except minor releases of petroleum. *Minor releases of petroleum* are defined as releases/spills that are: (1) less than five gallons; (2) contained on a non-permeable surface; and (3) are cleaned up within two hours.

The *FLEET Maintenance Supervisor* is responsible for conducting the necessary investigation required to complete PART 2 of the ERR, and implementing corrective actions for proper ERR closure (PART 3 of the ERR). ERRs are to be closed no later than six (6) days after discovery of the spill/release, unless outstanding circumstances warrant additional time for investigation (i.e., sampling/remediation event). Copies of all closed ERR forms (ERR PARTs 1 through 3) shall be maintained by *FLEET Maintenance EH&S* for a minimum of five (5) years.

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10 Attachments

10.1 Attachment A – Environmental Release Report (ERR)

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PART 1 - INITIAL NOTIFICATION (To Be Completed By The Facility Supervisor On-Duty)

FACILITY/CONTACT INFORMATION:

Reporting Supervisor: _____ Facility Phone: _____

DEP Bureau/Office: _____

Spill Location (facility/building): _____

Address: _____

Bureau/Office EHS Rep. Contacted: _____ Phone: _____

VENDOR/CONTRACTOR INVOLVEMENT: Yes No

Vendor/Contractor Responsible (if any): _____ Contract # _____

Company Contact: _____ Phone: _____

SPILL INFORMATION:

Start Date, Time of Event / / AM / PM End Date, Time of Event / / AM / PM

Chemical Name: _____ CAS No: _____

Trade Name: _____ Concentration (if applicable) _____

Source: Tank Tank Truck Drums Pipe Other: _____

PBS # _____ Tank # _____ Tank Size _____ Leak Rate _____ Vehicle # _____

Amount Spilled: _____ gal lbs. Amount Recovered: _____ gal lbs.

How Calculated: Daily Inventory Record Meter Scale Estimate (how): _____

Weather: _____ Temp.: _____ Wind Direction/Speed: _____

Spilled to: Secondary Containment Sewer Storm Drain Catch Basin Air

Surface Water * Soil Groundwater Other (list): _____

* Water Body: _____

Spill Impact: Fire Injury *** Fatality *** Evacuation

Road Closed Track Closed Waterway Closed SPDES Violation

Damages (describe): _____

***No./Type of Injuries/Fatalities: _____

NOTIFICATION INFORMATION:

DEP 24 Hour/DEP Police Rep. Contacted: _____ Date Reported: _____ Time _____ AM / PM

DEP HAZMAT Rep. Contacted (date and time): _____ NYC RQ: _____ lb/gal Ref. No.: _____

NYS DEC Rep. Contacted (date and time): _____ NYS RQ: _____ lb/gal Spill No.: _____

NRC Rep. Contacted (date and time): _____ Federal RQ: _____ lb/gal Spill No.: _____

Signature _____ Date _____

Release Report
Information

Attach a list of all DEP employees providing information used to complete Part I. Where feasible, such personnel should be shown the completed Part I to verify its accuracy prior to its being signed by the Reporting Supervisor.

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PART 2 - INVESTIGATION/REPORT (To Be Completed By The Investigator or Team)

Date Investigation Started: _____ **Time Started:** _____ **AM / PM**

DESCRIPTION OF INCIDENT

*Provide a summary of the incident, material Spilled, contaminate found, personnel involved (name/title), etc. What, when, where, who, how, and why. Describe operations being conducted. **Fact ONLY.** Avoid speculation.*

Continued - see attached

CONTRIBUTING FACTORS

List and explain all factors potentially contributing to the incident. Consider procedures, training, equipment, communications, human factors, environment or any other factors that contributed to the occurrence or severity.

Continued - see attached

Root Cause & Contributing Factors:

Procedures Training Process Design and Controls Inspection and Prevent Maint

Equipment, Materials or Changes Human Action External

Other: Explanation

CLEANUP

Describe who cleaned up, when, how, and any verification/testing.

Continued - see attached

CORRECTIVE ACTIONS

List each recommendation to prevent reoccurrence. Complete first 3 columns for Investigation and the last 2 columns after implementation (all recommendations must be resolved to close out the case).

Description of Corrective Action and Intent

Assigned to

Target Date

Date Resolved

Resolution/ Comments

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CONCLUSIONS	<i>Summarize investigation conclusions below.</i>

INVESTIGATION TEAM	<i>The incident investigation team members who sign below have reviewed and agree with the conclusions of this Spill investigation report.</i>
---------------------------	--

Name	Signature	Title/Affiliation	Date

REPORTS SUBMITTED:	<i>Written reports must be sent to DEP Hazmat <u>within 7 days</u>, DEC <u>within 14 days</u> and NRC <u>as soon as possible</u> for Spills above their respective RQs.</i>
---------------------------	---

Sent by EHS Rep.: _____ Dates: DEP DEC NRC

PART 3 - CLOSEOUT (To Be Completed By The Investigation Team)

CLOSEOUT	<i>I {Division Director/ _____} have determined that all of the Corrective Actions listed above have been completed or otherwise addressed as indicated above. {transmit final closeout copy to Bureau/Office EHS}</i>
-----------------	--

Name: _____ Signature: _____ Date: _____

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DEFINITIONS USED FOR ROOT CAUSE AND CONTRIBUTING FACTORS

1. Procedures may include, but are not limited to, Policies, procedures, work instructions and plans. Types of procedures may include Environmental, Health & Safety, Administrative, Operating or Maintenance. A Procedural Root Cause or Contributing Factor can be attributed to an incident if:
 - procedures that could have prevented the incident from occurring have not been written.
 - procedures are in place, however, they did not consider the situation in which the incident occurred or contained errors
 - procedures were drafted, but not approved.
 - Procedures exist, but are not typically followed or enforced

A Procedural Root Cause or Contributing Factor does not include conditions in which training was not performed or was inadequate.
2. A Training Root Cause or Contributing Factor can be attributed to an incident if:
 - training that could have reasonably prevented the incident was not provided.
 - training was significantly late
 - training did not address the tasks assigned to the position.
 - training was performed, but not checked to ensure the person understood (e.g. passing a test or observed for proficiency)
3. A Process Design and Controls Root Cause or Contributing Factor can be attributed to an incident if:
 - The process was not designed to address normal operating conditions
 - Insufficient safeguards were in place (this does not include if safeguards were by-passed)
 - The process does not have controls to manage design parameters, such as level or pressure
4. An Inspection and Preventive Maintenance Root Cause or Contributing Factor can be attributed to an incident if inspection and preventive maintenance were not in accordance with applicable procedures, manufacturer's recommendations, government standards and industry standards and are adequate for the service conditions. If Preventive Maintenance procedures do not exist, it is considered a Procedural Root Cause.
5. An Equipment, Materials or Change Root Cause or Contributing Factor can be attributed to an incident if:
 - the equipment, parts, and materials procured were not as initially specified,
 - the equipment, parts and materials were defective
 - the equipment, parts and materials did not meet or exceeded the applicable specifications.
 - the process has been changed from its design (excluding changes approved by Engineering).
6. A Human Action Root Cause or Contributing Factor can be attributed to an incident if personnel actions, activities and decisions were in accordance with procedures, training and expected workplace standards. This includes both errors and willfully not following standards.
7. An External Root Cause or Contributing Factor can be attributed to an incident if external items, such as weather or third parties (excluding contractors) did not cause or contribute to the incident.
8. An Other Root Cause or Contributing Factor can be attributed to an incident if the incident has not been satisfactorily classified in one or more of the above categories. The Other cause must be identified.

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PART 1 - INITIAL NOTIFICATION (To Be Completed By The Facility Supervisor On-Duty)

FACILITY/CONTACT INFORMATION:

Reporting Supervisor: _____ Facility Phone: _____
DEP Bureau/Office: _____
Spill Location (facility/building): _____
Address: _____
Bureau/Office EHS Rep. Contacted: _____ Phone: _____

VENDOR/CONTRACTOR INVOLVEMENT: Yes No

Vendor/Contractor Responsible (if any): _____ Contract # _____
Company Contact: _____ Phone: _____

SPILL INFORMATION:

Start Date, Time of Event / / AM / PM End Date, Time of Event / / AM / PM
Chemical Name: _____ CAS No: _____
Trade Name: _____ Concentration (if applicable) _____
Source: Tank Tank Truck Drums Pipe Other: _____
 PBS # Tank # Tank Size Leak Rate Vehicle # _____
Amount Spilled: _____ gal lbs. Amount Recovered: _____ gal lbs.
How Calculated: Daily Inventory Record Meter Scale Estimate (how): _____
Weather: _____ Temp.: _____ Wind Direction/Speed: _____

Spilled to: Secondary Containment Sewer Storm Drain Catch Basin Air
 Surface Water * Soil Groundwater Other (list): _____
* Water Body: _____

Spill Impact: Fire Injury *** Fatality *** Evacuation
 Road Closed Track Closed Waterway Closed SPDES Violation
 Damages (describe): _____

***No./Type of Injuries/Fatalities: _____

NOTIFICATION INFORMATION:

DEP 24 Hour/DEP Police Rep. Contacted: _____ Date Reported: AM / PM
DEP HAZMAT Rep. Contacted (date and time): _____ NYC RQ: _____ lb/gal Ref. No.: _____
NYS DEC Rep. Contacted (date and time): _____ NYS RQ: _____ lb/gal Spill No: _____
NRC Rep. Contacted (date and time): _____ Federal RQ: _____ lb/gal Spill No: _____

Signature _____ Date _____

Release Report Information	Attach a list of all DEP employees providing information used to complete Part I. Where feasible, such personnel should be shown the completed Part I to verify its accuracy prior to its being signed by the Reporting Supervisor.
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PART 2 - INVESTIGATION/REPORT (To Be Completed By The Investigator or Team)

Date Investigation Started: _____ **Time Started:** _____ **AM / PM**

DESCRIPTION OF INCIDENT	<i>Provide a summary of the incident, material Spilled, contaminate found, personnel involved (name/title), etc. What, when, where, who, how, and why. Describe operations being conducted. Fact ONLY. Avoid speculation.</i>
--------------------------------	--

Continued - see attached

CONTRIBUTING FACTORS	<i>List and explain all factors potentially contributing to the incident. Consider procedures, training, equipment, communications, human factors, environment or any other factors that contributed to the occurrence or severity.</i>
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Continued - see attached

Root Cause & Contributing Factors:

- | | | | |
|--|---------------------------------------|--|---|
| <input type="checkbox"/> Procedures | <input type="checkbox"/> Training | <input type="checkbox"/> Process Design and Controls | <input type="checkbox"/> Inspection and Prevent Maint |
| <input type="checkbox"/> Equipment, Materials or Changes | <input type="checkbox"/> Human Action | <input type="checkbox"/> External | |
| <input type="checkbox"/> Other: Explanation | | | |

CLEANUP	<i>Describe who cleaned up, when, how, and any verification/testing.</i>
----------------	--

Continued - see attached

CORRECTIVE ACTIONS	<i>List each recommendation to prevent reoccurrence. Complete first 3 columns for Investigation and the last 2 columns after implementation (all recommendations must be resolved to close out the case).</i>
---------------------------	---

Description of Corrective Action and Intent	Assigned to	Target Date	Date Resolved	Resolution/ Comments

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CONCLUSIONS

Summarize investigation conclusions below.

INVESTIGATION TEAM

The incident investigation team members who sign below have reviewed and agree with the conclusions of this Spill investigation report.

Name	Signature	Title/Affiliation	Date

REPORTS SUBMITTED:

Written reports must be sent to DEP Hazmat within 7 days, DEC within 14 days and NRC as soon as possible for Spills above their respective RQs.

Sent by EHS Rep.: _____ Dates: DEP DEC NRC

PART 3 - CLOSEOUT (To Be Completed By The Investigation Team)

CLOSEOUT

I {Division Director/_____} have determined that all of the Corrective Actions listed above have been completed or otherwise addressed as indicated above. {transmit final closeout copy to Bureau/Office EHS}

Name: _____ Signature: _____ Date: _____

DEFINITIONS USED FOR ROOT CAUSE AND CONTRIBUTING FACTORS

1. Procedures may include, but are not limited to, Policies, procedures, work instructions and plans. Types of procedures may include Environmental, Health & Safety, Administrative, Operating or Maintenance. A Procedural Root Cause or Contributing Factor can be attributed to an incident if:
 - procedures that could have prevented the incident from occurring have not been written.
 - procedures are in place, however, they did not consider the situation in which the incident occurred or contained errors
 - procedures were drafted, but not approved.
 - Procedures exist, but are not typically followed or enforced

A Procedural Root Cause or Contributing Factor does not include conditions in which training was not performed or was inadequate.
2. A Training Root Cause or Contributing Factor can be attributed to an incident if:
 - training that could have reasonably prevented the incident was not provided.
 - training was significantly late
 - training did not address the tasks assigned to the position.
 - training was performed, but not checked to ensure the person understood (e.g. passing a test or observed for proficiency)
3. A Process Design and Controls Root Cause or Contributing Factor can be attributed to an incident if:
 - The process was not designed to address normal operating conditions
 - Insufficient safeguards were in place (this does not include if safeguards were by-passed)
 - The process does not have controls to manage design parameters, such as level or pressure
4. An Inspection and Preventive Maintenance Root Cause or Contributing Factor can be attributed to an incident if inspection and preventive maintenance were not in accordance with applicable procedures, manufacturer's recommendations, government standards and industry standards and are adequate for the service conditions. If Preventive Maintenance procedures do not exist, it is considered a Procedural Root Cause.
5. An Equipment, Materials or Change Root Cause or Contributing Factor can be attributed to an incident if:
 - the equipment, parts, and materials procured were not as initially specified,
 - the equipment, parts and materials were defective
 - the equipment, parts and materials did not meet or exceeded the applicable specifications.
 - the process has been changed from its design (excluding changes approved by Engineering).
6. A Human Action Root Cause or Contributing Factor can be attributed to an incident if personnel actions, activities and decisions were in accordance with procedures, training and expected workplace standards. This includes both errors and willfully not following standards.
7. An External Root Cause or Contributing Factor can be attributed to an incident if external items, such as weather or third parties (excluding contractors) did not cause or contribute to the incident.
8. An Other Root Cause or Contributing Factor can be attributed to an incident if the incident has not been satisfactorily classified in one or more of the above categories. The Other cause must be identified.

**SPILL PREVENTION, ENVIRONMENTAL RELEASE REPORTING AND
INVESTIGATION**

ATTACHMENT B

CONTACT LIST

Volume 2

**Spill Prevention, Environmental Release Reporting &
Investigation
Attachment B**

Revision: 1
Effective Date: 10/29/04

Spill reporting

FEDERAL:

National Response Center (NRC): (800) 424-8802.

STATE:

Department of Environmental Conservation 24-hour spill response hotline
(800)-457-7362; outside New York State: 518-457-7362

IN CITY:

Department of Environmental Protection 24 Hour Call Center 212-689-1520

UPSTATE:

DEP BWS Police Command Center 888-426-7433

**NEW YORK CITY
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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Effective Date: 10/29/04

Regulatory Information Contacts
for the programs in the Division of Environmental Remediation

Regulation	Title	Contact
Part 595	Releases of Hazardous Substances	<p align="center">Help-Line 1 (518) 402-9549</p>
Part 596	Hazardous Substances Bulk Storage Regulations	
Part 597	List of Hazardous Substances	
Part 598	Handling and Storage of Hazardous Substances	
Part 611	Environmental Priorities and Procedures in Petroleum Cleanup and Removal	
Part 613	Handling and Storage of Petroleum	

**SPILL PREVENTION, ENVIRONMENTAL RELEASE
REPORTING AND INVESTIGATION**

ATTACHMENT C

ENVIRONMENTAL RELEASE REPORTING GUIDELINES

NEW YORK CITY
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Revision: 0
Effective Date: 03/08/05

ENVIRONMENTAL SPILL REPORTING GUIDELINES

A. In-City NYC DEP Reporting

A Spill in one of the five boroughs of New York City requires that reports be made first to DEP “Hazmat” (Division of Emergency Response & Technical Assessment) before reports to state and federal authorities. A spill is “reportable whenever the quantity spilled exceeds the NYC “Spill Bill” Reportable Quantity (RQ), which is often lower than the corresponding State/Federal RQ. Refer to the “DEP Spill Bill” for specific reporting requirements.

Telephone notification is required as soon as possible. Written notification shall be made to the NYCDEP within one week of the spill by certified mail to the following address:

Department of Environmental Protection
Division of Emergency Response & Technical Assessment
96-05 Horace Harding Expressway
Corona, NY 11368
New York, New York 10007
ATTN: Hazardous Substances
Emergency Response Officer

The completed DEP internal Environmental Spill Report and Incident Investigation Report (if any injuries) contains the information needed for the required written report. Additional written reporting requirements, including weekly written status reports for longer term remediation, may be included in Departmental orders issued pursuant to §24-608 and 24-610 of the Administrative Code.

B. Federal Reporting

The Nation Response Center (NRC) maintains a 24 hour per day, 7 day a week, 365 day a year Operations Center where all information is received via the toll-free number, entered directly into an on-line data base system, and electronically disseminated as part of the National Response System.

NRC is the single contact point for reporting all pollution incidents. It acts as a national 911 service for environmental incidents. Calling the toll-free number fulfills nearly all federal requirements for reporting oil and chemical spills, spills of nuclear material, chemical and biological warfare agents, train derailments, and pipeline spills.

Once contacted, the NRC Duty Officer will guide the caller through a detailed series of questions to gather as much information as possible concerning the spill. The information is immediately entered into the Incident Reporting Information System (IRIS) and based on several pre-established criteria including material involved, mode of transportation, injuries, damage, and fatalities, select federal agency notification will take place within 15 minutes of receipt. When any of the following incidents occur, the NRC should immediately be contacted by the responsible party via the toll free number.

Reporting Requirements:

Oil Spills

The responsible party shall notify the National Response Center as soon as knowledgeable of an oil spill from a vessel or facility operating:

- ◆ In or along U.S. navigable waters;
- ◆ On the Outer Continental Shelf;
- ◆ In a deepwater port; or
- ◆ From a vessel transporting oil from the Outer Continental Shelf.

In practice, “in or along navigable waters” has been broadly interpreted as any location that could potentially drain to a waterway (i.e., just about everywhere).

Chemical Spills

The Comprehensive Environmental Response, Compensation, and Liability Act requires that all spills of hazardous substances (including radionuclides) exceeding reportable quantities, be reported by the responsible party to the National Response Center. Title 40 of the Code of Federal Regulations Part 302 promulgates reportable quantities and reporting criteria. All the Extremely Hazardous Chemicals (EHS) which overlap with the CERCLA listed chemicals table (40 CFR Part 302.4) should be reported to NRC as well as to the LEPC and SERC.

Transportation Accidents

Transportation accidents involving hazardous materials, including radioactive substances, must be reported to the National Response Center immediately by the carrier when, as a direct result of the materials:

- ◆ A person is killed;
- ◆ A person receives injuries requiring hospitalization;
- ◆ Property damage exceeds \$50,000; or
- ◆ Fire, breakage, or spillage of an etiologic agent occurs.

Liquid Pipeline Spills

The responsible party must call the National Response Center when a pipeline system failure spills a hazardous liquid or carbon dioxide that causes any of the following:

- ◆ An explosion or fire;
- ◆ An escape to the atmosphere of more than five barrels a day of highly volatile liquid or carbon dioxide;
- ◆ A death or injury;
- ◆ Property damage exceeding \$50,000;
- ◆ Pollution of any body of water; or

**Spill Prevention, Environmental Release Reporting and
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- ◆ An incident deemed significant by the operator.

Gas Pipeline Spills

Spills of any toxic, corrosive or flammable gas, liquefied natural gas (LNG) or gas from an LNG facility must be reported to the National Response Center by the responsible party when:

- ◆ A death or injury involving patient hospitalization occurs;
- ◆ More than \$50,000 damage occurs (including cost of lost gas)
- ◆ The Spill results in the emergency shutdown of an LNG facility; or
- ◆ An incident is deemed significant by the operator.

Other Spills

Discharges from a hazardous waste treatment or storage facility must be reported by the **Responsible Manager** at the facility. Abandoned dump or waste sites should be reported by anyone having knowledge of such a site.

Incidents Involving Terrorism Or Possible Terrorist Activity

Any incident related to terrorism or possible terrorist activity requires telephonic notification to the National Response Center. **DO NOT SEND AN ON-LINE REPORT!** This would include bombings, bomb threats, suspicious letters or packages, and incidents related to the intentional spill of chemical/biological/radio active agents. NRC watch standers have been trained to ask specific questions for such reports and will immediately pass the information to the proper agencies for response.

1.1.1 State Reporting

The Bureau of Spill Prevention and Response (BSPR) is responsible for the implementation of the New York State Department of Environmental Conservation's (DEC) oil spill cleanup and prevention programs. It is required that any spill or discharge of any quantity of oil or petroleum be reported to the DEC within 2 hours unless they meet all of the following criteria:

- ◆ The spill is known to be less than 5 gallons;
- ◆ The spill is contained and under the control of the spiller;
- ◆ The spill has not and will not reach the State's water or any land; and
- ◆ The spill is cleaned up within 2 hours of discovery.

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Spill of a hazardous substance shall be reported to the DEC within 2 hours when:

- ◆ Quantity is greater than reportable quantity; or
- ◆ Spill results, or may reasonably be expected to result, in a fire with potential off-site impacts; or
- ◆ Spill causes, or may reasonably be expected to cause, an explosion; or
- ◆ Spill causes, or may reasonably be expected to cause, a contravention of air quality standards; or
- ◆ Spill results, or may reasonably be expected to result, in vapors, dust and/or gases that may cause illness or injury to persons, not including persons in a building at the facility where a Spill originates; or
- ◆ Runoff from fire control or dilution waters may cause or contribute to a exceeding water quality standards.

A spill or overflow of a reportable quantity of a hazardous substance to a secondary containment system does not have to be reported within 2 hours if all the following conditions are met:

- ◆ The secondary containment system meets the requirements of NYCRR sections 599.9 and 599.17 (standards for new or modified hazardous substance storage facilities);
- ◆ There is control over the spill or overflow, and it is completely contained within 24 hours; and
- ◆ The total volume of the spill or overflow is recovered or accounted for.

In the event that the spill or overflow is not completely contained within 24 hours, or its total volume is not accounted for within that time, such spill or overflow must be reported within 24 hours of its occurrence. If the secondary containment system does not prevent a reportable quantity of the hazardous substance from reaching the environment, the spill or overflow must be reported at the time the substance reaches the environment, but in no event later than 24 hours from the time of the spill or overflow.

A Reportable Quantity (RQ) is defined in 40 CFR Part 302, 40 CFR Part 355, or 6 NYCRR Part 597. If the RQ for the spilled substance is unknown, assume the RQ has been exceeded and report the spill accordingly.

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1.1.2 Internal Reporting

Following an incident that resulted in a Spill of oil or other hazardous substance, notify management as defined in the procedure.

**SPILL PREVENTION, ENVIRONMENTAL RELEASE REPORTING AND
INVESTIGATION**

ATTACHMENT D

ENVIRONMENTAL RELEASE INVESTIGATION GUIDELINES

GUIDELINES FOR INVESTIGATING CATEGORY III ENVIRONMENTAL INCIDENTS

A. Initial Data Collection

1. **Survey the Scene:** The incident investigation team will first consult with the emergency responders to determine whether the incident has been stabilized and that there is no remaining imminent danger. Once the emergency responders assess the scene for danger and determine that the incident has been safely mitigated, the incident investigation team will survey the scene and determine the following:
 - Who was involved;
 - What happened to lead to the release;
 - What systems or operations were affected; and
 - When did the actions or steps happen?
2. **Identify Witnesses:** The incident investigation team will identify witnesses to the incident. Each witness will be asked not to discuss the accident with anyone until he/she has been interviewed by the incident investigation team. However, each witness will be asked to immediately prepare a written account of what they experienced.
3. **Secure the Scene:** The incident scene will be secured by the incident investigation team in order to preserve evidence. Any items (e.g., damaged equipment and spill samples) that might help to explain what happened should be left untouched. Coordinate with and defer to police and/or fire investigators before collecting evidence. Disturbing the scene of a police or fire investigation may be a criminal offense.
4. **Collect and Preserve Evidence:** Based upon the nature of the incident and the requirements of outside investigation agencies, the incident investigation team will photograph and/or videotape the area. This includes the point of initiation and the entire affected area. The incident investigation team will collect evidence that contributed to the cause of the accident and is subject to change (e.g., dust, etc.) and document where the evidence was found. Then they will record (e.g., photograph and take notes) the relative locations of people, parts, and materials (i.e., note the positions of valves, switches, and any controls). Finally, they will collect any written documents that may aid the investigation, such as written instructions, container labels, operator logs, and training records. The date and time must be noted on all photographs.
5. **Interview Witnesses:** The incident investigation team will record statements from the operators, persons near the accident, witnesses, and emergency response personnel. Questions should relate to the events leading up to the accident including time of day, weather conditions, what happened, why it happened, and any suggestive corrective actions that should be taken to prevent reoccurrence. The date and time of all interviews must be recorded in interview notes.

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B. Incident Analysis

The technique to be used in analyzing a serious incident will be cause and effect analysis. This technique requires that all incident investigation team members review the evidence and then meet as a group to determine root causes of the incident. The facts derived from a review of the evidence will be evaluated in relationship to four categories from which problems may arise. The four categories are the following:

Methods (procedures and practices).

Materials.

Machines.

Manpower (personnel).

APPENDIX 5
VAPOR BARRIER SPECIFICATIONS

Preprufe® Tape

DESCRIPTION

Preprufe® Tape is a specially formulated two sided, reinforced pressure sensitive tape. The bottom side of the tape has a highly aggressive pressure sensitive adhesive which is designed to adhere to penetrations, protrusions and Bituthene® membranes. The top side has another layer of adhesive and a protective coating. The protective coating protects the tape from the weather and UV light for up to 30 days after application. A thin flexible film is sandwiched between the two layers of pressure sensitive adhesive. The tape develops a continuous mechanical bond with the concrete that is cast against it.

Preprufe Tape is supplied in rolls and is interwound with a silicone coated release liner.

USE

Preprufe Tape is used in detail areas including end laps, penetrations and various tie-ins. It is also used to patch damaged areas in the Preprufe membranes. The tape is a critical component of the Preprufe system since it is designed to develop a continuous mechanical bond to concrete that is cast against it.

APPLICATION

Apply Preprufe Tape when ambient temperatures are -4°C (25°F) or above.

Wipe Preprufe membranes clean to remove any dirt, dust or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust and loose particles.

Unroll the tape and adhere the exposed pressure sensitive adhesive surface to the membrane or penetration. The protective coating surface of the tape should face toward the concrete to be cast.

Use heavy hand pressure or a hand roller to maximize adhesion. Remove the release liner during application. Cast concrete or apply shotcrete within 30 days of application of the tape.

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<input type="checkbox"/> NO COMMENT	<input type="checkbox"/> RESUBMIT FOR RECORD	
REVIEW IS FOR THE LIMITED PURPOSE OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED OR REVIEW MADE OF THE ACCURACY OR COMPLETENESS OF DIMENSIONS OR QUANTITIES.		
DATE 2-6-13	NAME <i>Paul Wernick</i>	
CSI #	FILE #	SUBMITTAL #

For Technical Assistance call us at 800-444-6459 (Option 3).



Visit our web site at: www.graceconstruction.com

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W.R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

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GRACE
Construction Products

PREPRUFE® 300R & 160R

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

Description

Preprufe® 300R & 160R membranes are unique composite sheets comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating.

Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe bond to concrete prevents ingress or migration of water around the structure.

The Preprufe R System includes:

- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

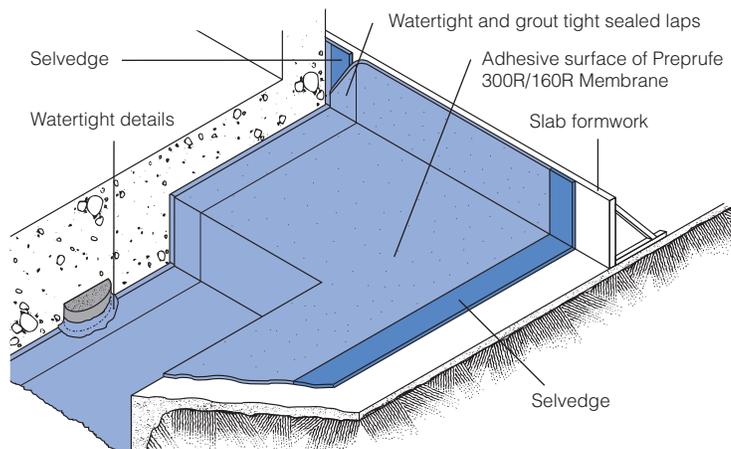
Preprufe can be returned up the inside face of slab formwork but is not recommended for conventional twin-sided formwork on walls, etc. Use Bituthene self-adhesive membrane or Procor® fluid applied membrane to walls after removal of formwork for a fully bonded system to all structural surfaces.

Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Fully-adhered watertight laps** and detailing
- **Provides a barrier to water, moisture and gas**—physically isolates the structure from the surrounding ground
- **BBA Certified** for basement Grades 2, 3, & 4 to BS 8102:1990
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
- **Inherently waterproof, non-reactive system:**
 - not reliant on confining pressures or hydration
 - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack

2-06-13

CSI #	FILE #	NAME	SUBMITTAL #
		Paul Woodcock	
DATE			
STONEHILL & TAYLOR ARCHITECTS <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> APPROVED AS NOTED <input type="checkbox"/> NO COMMENT <input type="checkbox"/> REVISE AND RESUBMIT <input type="checkbox"/> REJECTED <input type="checkbox"/> RESUBMIT FOR RECORD REVIEW IS FOR THE LIMITED PURPOSE OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED OR REVIEW MADE OF THE ACCURACY OR COMPLETENESS OF DIMENSIONS OR QUANTITIES.			



Drawings are for illustration purposes only. Please refer to graceconstruction.com for specific application details.

Installation

The most current application instructions, detail drawings and technical letters can be viewed at graceconstruction.com. For other technical information contact your local Grace representative.

Preprufe 300R & 160R membranes are supplied in rolls 4 ft (1.2 m) wide, with a selvage on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.

Substrate Preparation

All surfaces—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

Horizontal—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

Vertical—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

Membrane Installation

Preprufe can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application. Alternatively, Preprufe Low Temperature (LT) is available for low temperature condition applications. Refer to Preprufe LT data sheet for more information.

Horizontal substrates—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed (see Figure 2).

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvage. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

Refer to Grace Tech Letter 15 for information on suitable rebar chairs for Preprufe.

Vertical substrates—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be made through the selvage using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to

overlap. Roll firmly to ensure a watertight seal.

Roll ends and cut edges—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap edges and roll firmly (see Figure 3). Immediately remove printed plastic release liner from the tape.

Details

Refer to Preprufe Field Application Manual, Section V Application Instructions or visit graceconstruction.com. This manual gives comprehensive guidance and standard details.

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Preprufe Tape centered over the damaged area and roll firmly. Remove the release liner from the tape. Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with Preprufe Tape, remove the release liner from the tape and roll firmly. Any areas of damaged adhesive should be covered with Preprufe Tape. Remove printed plastic release liner from tape. Where exposed selvage has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems.

A minimum concrete compressive strength of 1500 psi (10 N/mm²) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

Refer to Grace Tech Letter 17 for information on removal of formwork for Preprufe.

Figure 1



Figure 2

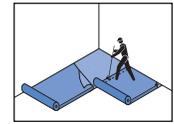
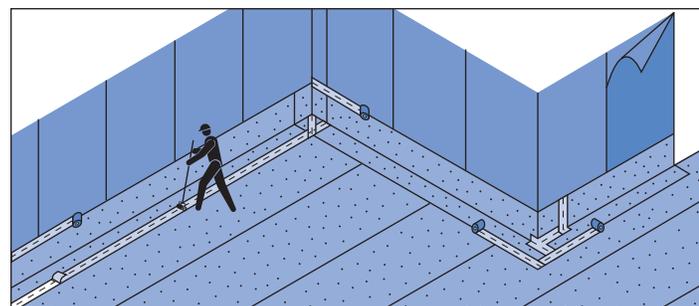
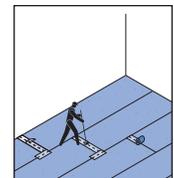


Figure 3

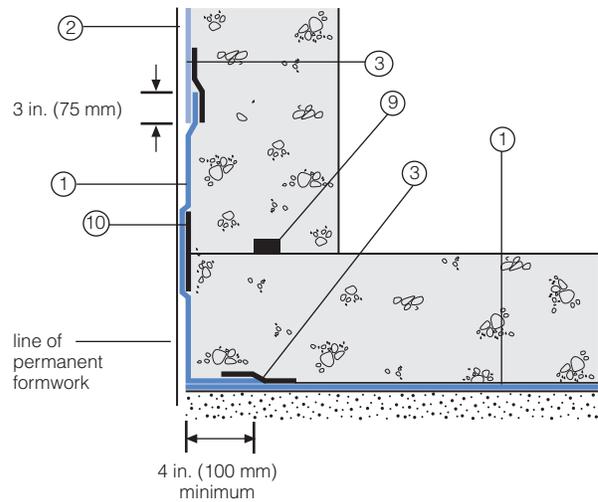


Detail Drawings

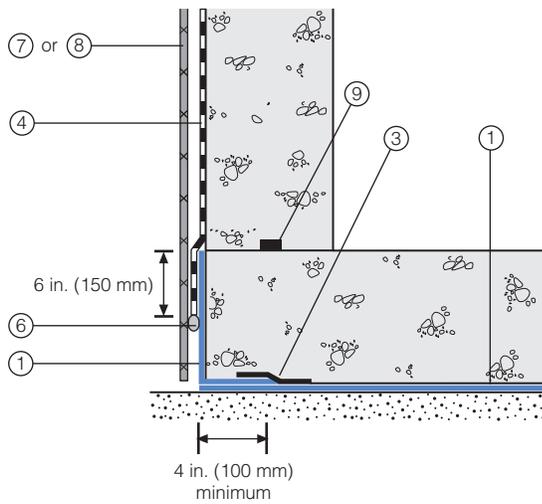
Details shown are typical illustrations and not working details. For a list of the most current details, visit us at graceconstruction.com.

For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

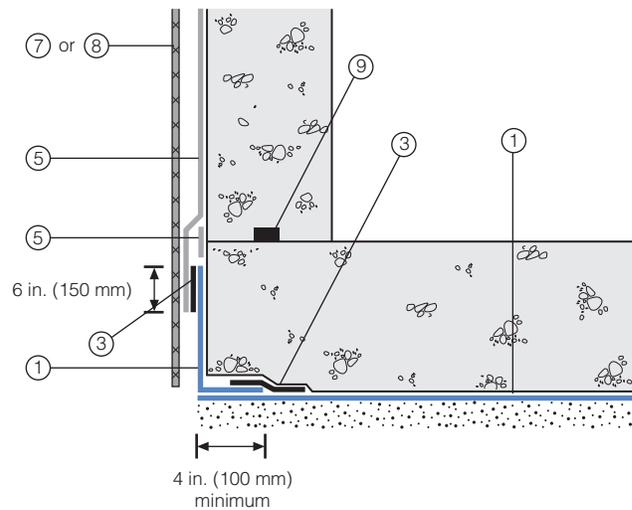
Wall base detail against permanent shutter



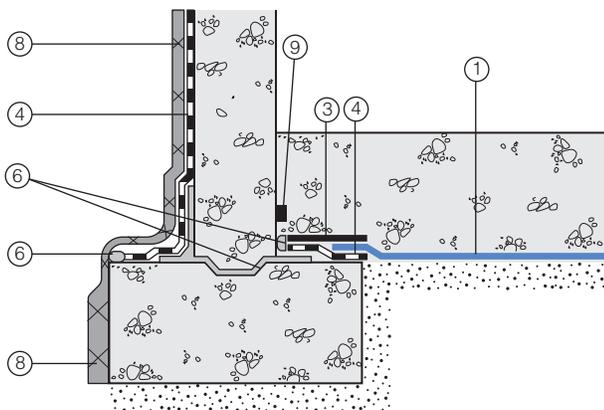
Bituthene wall base detail (Option 1)



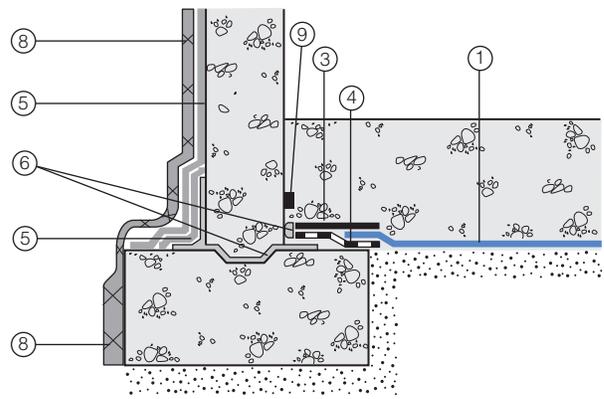
Procor wall base detail (Option 1)



Bituthene wall base detail (Option 2)



Procor wall base detail (Option 2)



- 1 Preprufe 300R
- 2 Preprufe 160R
- 3 Preprufe Tape
- 4 Bituthene

- 5 Procor
- 6 Bituthene Liquid Membrane
- 7 Protection

- 8 Hydroduct®
- 9 Adcor ES
- 10 Preprufe CJ Tape

Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft ² (36 m ²)	460 ft ² (42 m ²)	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)
* LT denotes Low Temperature (between 25°F (-4°C) and 86°F (+30°C)) HC denotes Hot Climate (50°F (>+10°C))			
Ancillary Products			
Bituthene Liquid Membrane—1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)			

Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified ¹
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified ²
Elongation	500%	500%	ASTM D412, modified ³
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified ⁴
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified ⁵
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa × s × m ²))	0.01 perms (0.6 ng/(Pa × s × m ²))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

Footnotes:

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
- Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
- Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
- Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
- The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute.

Specification Clauses

Preprufe 300R or 160R shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved membranes shall be bonded to Preprufe 300R/160R. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor with Preprufe.

Health and Safety

Refer to relevant Material Safety data sheet. Complete rolls should be handled by a minimum of two persons.

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

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BITUTHENE® MASTIC

One part, gun or trowel applied mastic for sealing Bituthene membrane terminations and details

Description

Bituthene® Mastic is a rubberized, asphalt-based mastic. It has excellent adhesion to structural concrete, masonry and wood. The VOC (Volatile Organic Compound) content is 200 g/L.

Architectural and Industrial Maintenance Regulations limit the VOC content in products classified as Architectural Coatings. Refer to Technical Letters at www.graceconstruction.com for most current list of allowable limits.

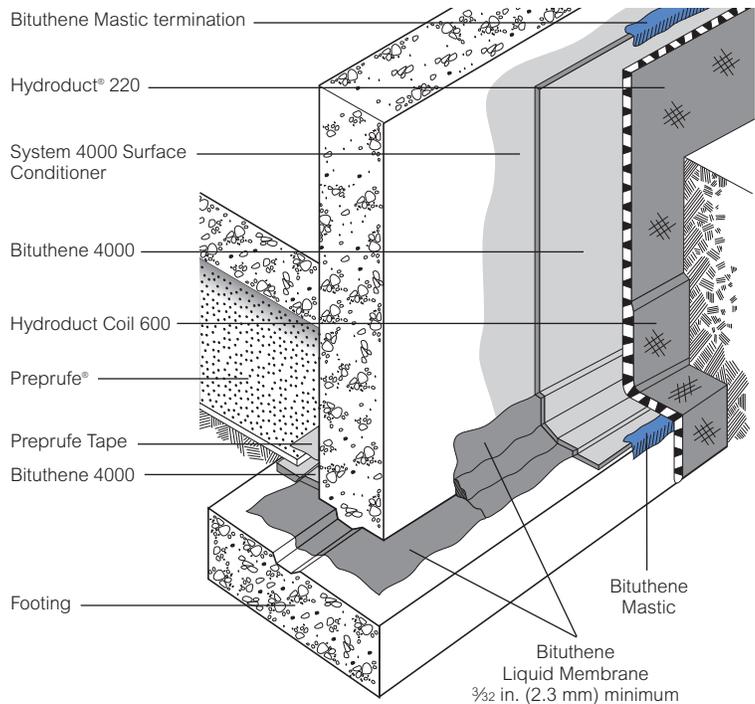
Bituthene Mastic is available in tubes or pails.

Use

Bituthene Mastic is designed to seal terminations, edges of patches and overlaps in detail areas. On vertical applications, the mastic must be applied to both the top and bottom terminations.

Limitation

Bituthene Mastic is an integral part of the Bituthene waterproofing system. This mastic should not be applied where it will be covered with Bituthene waterproofing membrane, except as permitted as a temporary cutoff. It should not be used as a primary waterproofing material.



Drawings are for illustration purposes only. Please refer to www.graceconstruction.com for specific application details.

Product Advantages

- Excellent adhesion
- Seals terminations, edges of patches and overlaps in detail areas

STONEHILL & TAYLOR ARCHITECTS		
<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> REVISE AND RESUBMIT	
<input type="checkbox"/> APPROVED AS NOTED	<input type="checkbox"/> REJECTED	
<input type="checkbox"/> NO COMMENT	<input type="checkbox"/> RESUBMIT FOR RECORD	
REVIEW IS FOR THE LIMITED PURPOSE OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED OR REVIEW MADE OF THE ACCURACY OR COMPLETENESS OF DIMENSIONS OR QUANTITIES.		
DATE 2-6-13	NAME <i>Paul Wernick</i>	
CSI #	FILE #	SUBMITTAL #

Supply

Bituthene Mastic		
Unit size	30 oz (.9 L) tube	5 gal (18.9 L) pail
Packaging	12 tubes/carton	36 pails/pallet
Weight	33 lbs (15 kg)/carton	54 lbs (24 kg)/pail
Coverage	1 tube—65 linear feet (20 m) [0.25 in. (6 mm) x 0.25 in. (6 mm) bead]	100 linear ft/gal (8.1 m/L) [1 in. (25 mm) wide troweling]

Application Procedures

Safety, Storage and Handling Information

Bituthene products must be handled properly. Vapors from solvent-based primers and mastic are harmful and flammable. For these products, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. Material Safety Data Sheets (MSDS) are available at www.graceconstruction.com and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the MSDS before use.

Application

Apply Bituthene Mastic either with a caulking gun or trowel. If applied with a caulking gun, level the bead with a trowel to about 0.125 in. (3 mm) thickness and 0.5 in. (13 mm) to 1 in. (25 mm) width. When applied as a temporary cutoff, trowel Bituthene Mastic to 0.060 in. (1.5 mm) thickness. Bituthene waterproofing membrane may be placed over the thin cutoff the next day.

On the bottom edge of vertical applications, Bituthene Mastic should be troweled upward. Use it liberally at membrane terminations.

Material usage requirements for Bituthene Mastic will vary widely from job to job. On large horizontal plaza areas with few protrusions, only about one quarter of a tube may be required per roll of membrane. A vertical application may require one half tube or more per roll of membrane. Applications involving other protrusions may require one or more tubes per roll.

Clean tools with mineral spirits at the end of each day. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations. Do not use solvents to clean hands or skin.

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

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APPENDIX 6
Foundation Section Detail – Site Wide Cover System

