



TECHNICAL MEMORANDUM

To: Dr. Al Maki, Environmental Advisor
ExxonMobil Production Company

From: Sharon Sullivan, Project Geologist
URS Corporation

Copy: Dr. Jack Colonell, URS Corporation
Bryan Trimm, URS Corporation

Date: December 20, 2002

Subject: Point Thomson Unit #3 Surface Water Sampling Results

This technical memorandum documents the collection and analysis of marine, estuarine, and fresh surface water bodies in the vicinity of the Point Thomson Unit #3 gravel pad and proposed pad expansion area on the North Slope of Alaska.

Introduction

ExxonMobil Production Company (ExxonMobil) and the Point Thomson Unit owners are evaluating the opportunity to develop the Point Thomson Unit for the production and transport of gas condensate. As part of this development, expansion of an existing gravel pad has been proposed.

The Point Thomson Unit #3 gravel pad is located along the Beaufort Sea coast, approximately 46 miles east of Prudhoe Bay, on the North Slope of Alaska. A vicinity map of the Point Thomson Unit is provided as Figure 1.

URS Corporation (URS) collected thirteen surface water samples in the vicinity of the Point Thomson Unit #3 gravel pad and proposed pad expansion area on behalf of ExxonMobil on September 27, 2002. The surface water samples were collected from marine, estuarine (brackish), and fresh water bodies to acquire physical and chemical data to support the National Pollutant Discharge Elimination System (NPDES) permit process associated with the proposed Point Thomson Gas Cycling Project.

The samples were analyzed for parameters based on guidance from the Environmental Protection Agency's (EPA) *New Sources and New Discharger: Application for Permit to Discharge Process Wastewater* (EPA, 1990). The document specifies the conventional list of parameters (Group A) that must be measured in potential effluent receiving waters in order to establish baseline data for future comparison. Additional parameters not listed in this guidance were analyzed to ensure that the baseline data set includes a measure of potential contaminants that may have been previously introduced into the Point Thomson gravel pad area. Table 1 provides the list of parameters analyzed and the basis for including the parameters in the data set.

Table 1. Point Thomson NPDES Surface Water Sampling Event, 9-27-02

Parameter	Basis for Analysis
<ul style="list-style-type: none"> ▪ Biochemical Oxygen Demand ▪ Chemical Oxygen Demand ▪ Total Organic Carbon ▪ Total Suspended Solids ▪ Ammonia ▪ Temperature ▪ pH 	Support future NPDES application by satisfying Group A analytes from <i>New Sources and New Discharger: Application for Permit to Discharge Process Wastewater</i> (EPA, 1990).
<ul style="list-style-type: none"> ▪ Salinity 	Determine water sample type (fresh, brackish, or marine), which determines applicable water quality criteria.
<ul style="list-style-type: none"> ▪ Total Metals (As, Ba, Ca, Cr*, Pb*, Mg, Ni*, Na, Zn*) ▪ Volatile Organic Compounds including Total Aromatic Hydrocarbons (TAH), and Total Aqueous hydrocarbons (TAqH) ▪ Polynuclear Aromatic Hydrocarbons 	Establish baseline data for contaminants that may have previously been introduced into the environment; compare results to applicable surface water quality criteria.

* Water quality criteria for these metals vary depending on water hardness.

Field Activities

All field activities for the 2002 sampling event were conducted in accordance with the ExxonMobil 2002 *Field Sampling Plan*, provided as Attachment A. Per the field sampling plan, URS collected 15 surface water quality samples (including two field duplicates) from water bodies in the vicinity of the proposed pad development. Two samples were collected from marine water; two others from estuarine (brackish) water; and nine (plus two field duplicates) from freshwater tundra ponds. A thin layer (0.5 to 1.5 inches) of ice covered the freshwater bodies and had to be broken to access water for sampling.

Field measurements were collected at each sample location by submersing a calibrated Horiba™ water meter probe into the top four inches of each water body. Field measurements collected included pH, conductivity, dissolved oxygen (DO), temperature, and salinity. The DO readings appeared to be affected by the cold water and often took additional time to stabilize.

Along with field measurements, URS documented visual observations taken at each sample location. These observations are provided in Attachment B and include the size and shape of each sample water body, the appearance of the sediment and vegetation, the presence or absence of sheen or odor, any observations of aquatic life, and any interconnection between the sample water body and other water bodies. Additionally, coordinates of each sample location were taken using a hand-held global positioning system (GPS). Table 2 lists the coordinates for each location. Figure 2 shows the location of each sample collection station in the Point Thomson Unit #3 area.

Table 2. Sample Locations

Station ID	Latitude	Longitude
PTU3-SW1	70.17270	146.25232
PTU3-SW2	70.16982	146.24993
PTU3-SW3	70.16950	146.25200
PTU3-SW4	70.16925	146.25557
PTU3-SW5 PTU-SW14	70.16807	146.25447
PTU3-SW6	70.16567	146.26765
PTU3-SW7 PTU3-SW15	70.16567	146.26765
PTU3-SW8	70.16890	146.26410
PTU3-SW9	70.16822	146.26533
PTU3-SW10	70.16825	146.26530
PTU3-SW11	70.16778	146.24783
PTU3-SW12	70.16705	146.25022
PTU3-SW13	70.16787	146.25887

Findings

Analytical data and field measurements are presented at the end of this report as Attachment C. These data were compared to the applicable water quality criteria (AWQC), which are shown in the last column of the Attachment C data tables. The AWQC provided in Appendix C are the most stringent criterion among all protective water use classes presented in the Alaska Department of Environmental Conservation (ADEC) surface water quality standards (18 Alaska Administrative Code [AAC] 70), the ADEC drinking water standards (18 AAC 80), and the U.S. Environmental Protection Agency ambient water quality criteria. All sample results were below the applicable water quality standards. Results from this sampling effort include:

- Volatile and semi-volatile constituents, including Total Aromatic Hydrocarbons (TAH) and Total Aqueous Hydrocarbons (TAqH), were not detected above the method reporting limits.
- The concentrations of all metals were below the AWQC. The water quality criteria for chromium, lead, nickel, and zinc vary depending on water hardness. A water quality criterion calculator table was prepared to determine the water quality criteria for each sample's hardness dependent metals. This table is included in Attachment C.
- Field parameters were also compared to applicable water quality standards. Only pH has an applicable water quality criterion; all samples were within acceptable pH limits.
- The remaining physical and chemical parameters do not have applicable water quality standards, but appear to represent typical surface water conditions for the North Slope.

With the possible exception of drilling mud and cuttings, and sanitary and domestic wastewater discharged in the 1970's and the early 1980's during exploration drilling, there are no known potential chemical hazards within the Point Thomson sampling area. The parameters measured in the Point Thomson Unit #3 area are, therefore, likely representative of naturally occurring

conditions and provide a valid baseline data set from which to measure future potential development impacts.

Data Quality Evaluation

An evaluation of data quality was performed to verify that the data quality indicators met the data quality objectives documented in the workplan. All analytical data are useable for the purposes of this project. A Quality Assurance/Quality Control (QA/QC) Summary Report was prepared and is provided as Attachment D. Data have been qualified where specific control criteria have not been met. The metals samples were preserved after sample collection; therefore, the metal results could be biased slightly low due to possible loss by adsorption to the sample container walls. With the exception of a possible low bias for metals results, the evaluation showed that the data quality objectives were met.

Summary

In conclusion, all sample results were below applicable water quality standards. No anomalous data were measured and all results appear to provide a representative data set of background conditions in potential effluent receiving surface waters near the Point Thomson Unit #3 proposed pad expansion area.

References

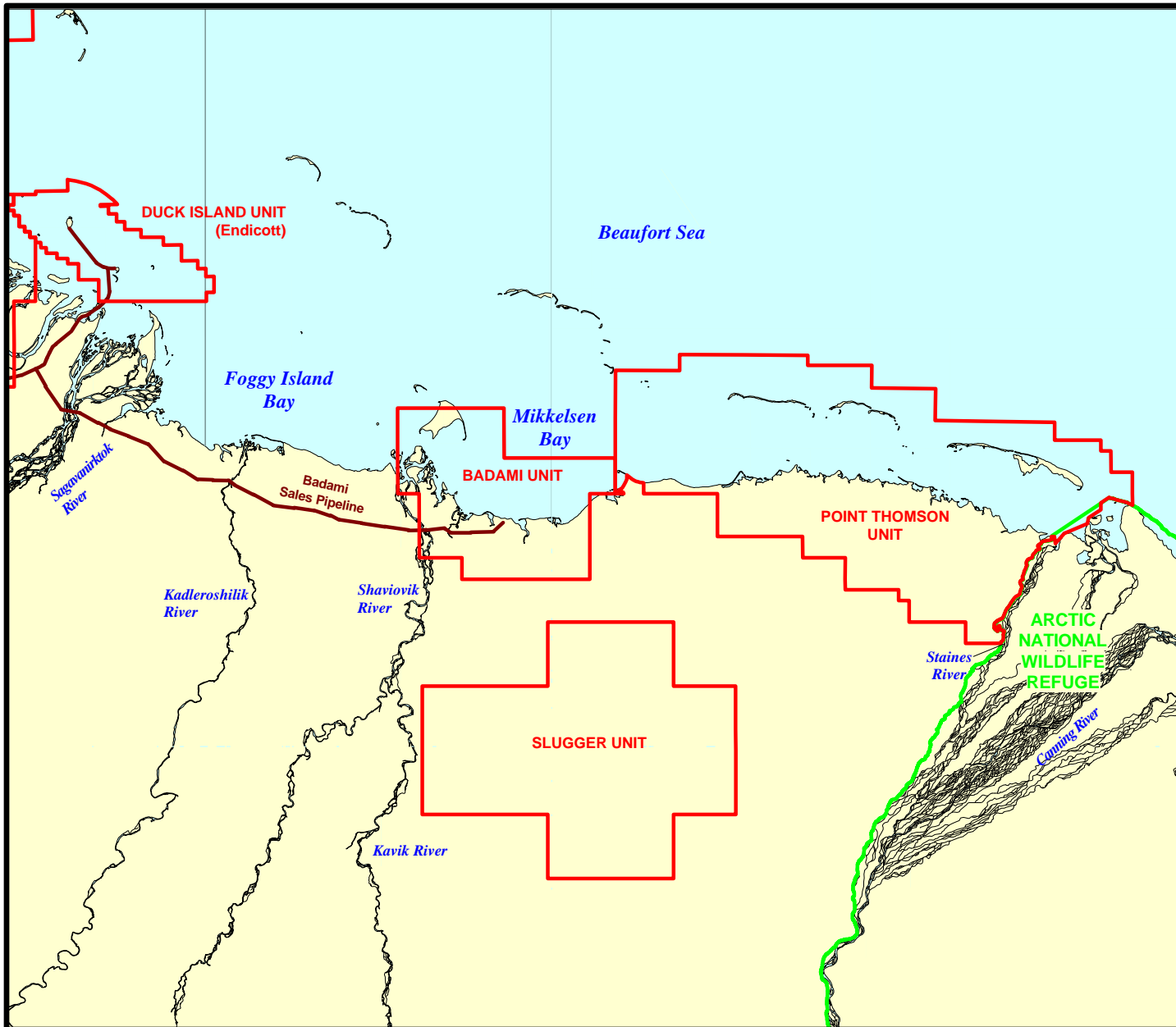
EPA. 1990. *Application Form 2D – New Sources and New Dischargers: Application for Permit to Discharge Process Wastewater.*

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**Point Thomson Gas
Cycling Project**

Figure 1

**Point Thomson
Vicinity Map**

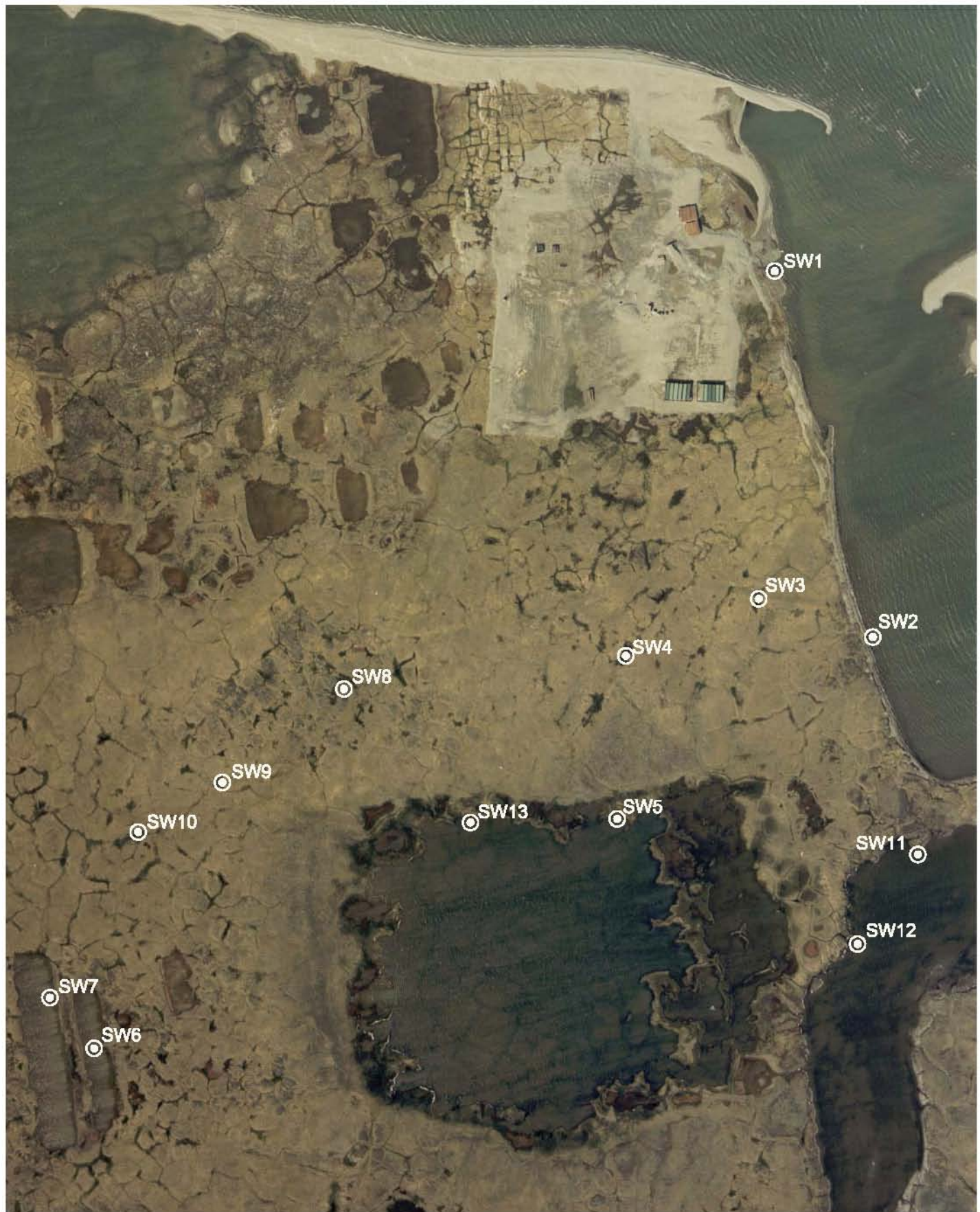


Miles

Base maps provided by BPXA
Cartography.

URS

Anchorage, Alaska



LEGEND

SW6
 ● Sample Location with ID



**SURFACE WATER SAMPLE LOCATION MAP
 POINT THOMSON, ALASKA**

PROJECT: 26218846	DRAWN BY: SRJ	FIGURE 2
DATE: 28 OCTOBER 2002	FILE: Pt_Thomson_01.dwg	

Attachment A
Field Sampling Plan

POINT THOMSON GAS CYCLING PROJECT

NPDES SURFACE WATER SAMPLING EVENT

2002 FIELD SAMPLING PLAN DRAFT REVISION 1

Prepared for:

ExxonMobil

ExxonMobil Production Company
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and

The Point Thomson Unit Owners

September 24, 2002

Prepared by:

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ATTACHMENT

ATTACHMENT 1	Safety, Health and Environmental Plan
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ACRONYMS AND ABBREVIATIONS

BOD	biochemical oxygen demand
CFR	Code of Federal Regulations
COD	chemical oxygen demand
DO	dissolved oxygen
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
HCL	hydrochloric acid
H ₂ SO ₄	sulfuric acid
NH ₃	ammonia
NPDES	National Pollutant Discharge Elimination System
SHE	Safety, Health and Environmental Plan
TOC	total organic carbon
TSS	total suspended solids
XOM	ExxonMobil Production Company

1.0 INTRODUCTION

This Field Sampling Plan (FSP) describes the fieldwork to be performed in September 2002 at Point Thomson Unit #3 on behalf of ExxonMobil Production Company (XOM). Fieldwork will consist of collecting physical and chemical data to support National Pollutant Discharge Elimination System (NPDES) permit applications associated with the proposed Point Thomson Gas Cycling Development Project.

The Point Thomson Unit #3 site is located along the Beaufort Sea Coast, approximately 46 miles east of Prudhoe Bay, on the North Slope of Alaska. A vicinity map of the Point Thomson Unit is provided as Figure 1. This FSP describes the methods for general field activities and the collection and handling of field samples. Procedures outlined in this document will be utilized in the field to ensure consistency and integrity of the work performed.

The site is not located on the road system, which was considered in the development of the *Safety, Health and Environmental Plan (SHE)* for this project. The SHE, presented as Attachment 1, describes the safety procedures that field personnel will follow when traveling to the remote site and conducting fieldwork. The SHE also lists potential physical, chemical, and biological hazards and outlines project training requirements.

The contents and organization of this Field Sampling Plan are as follows:

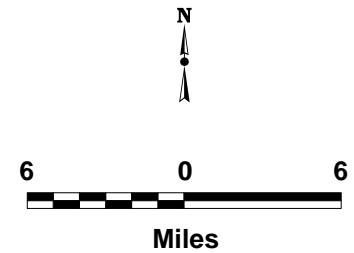
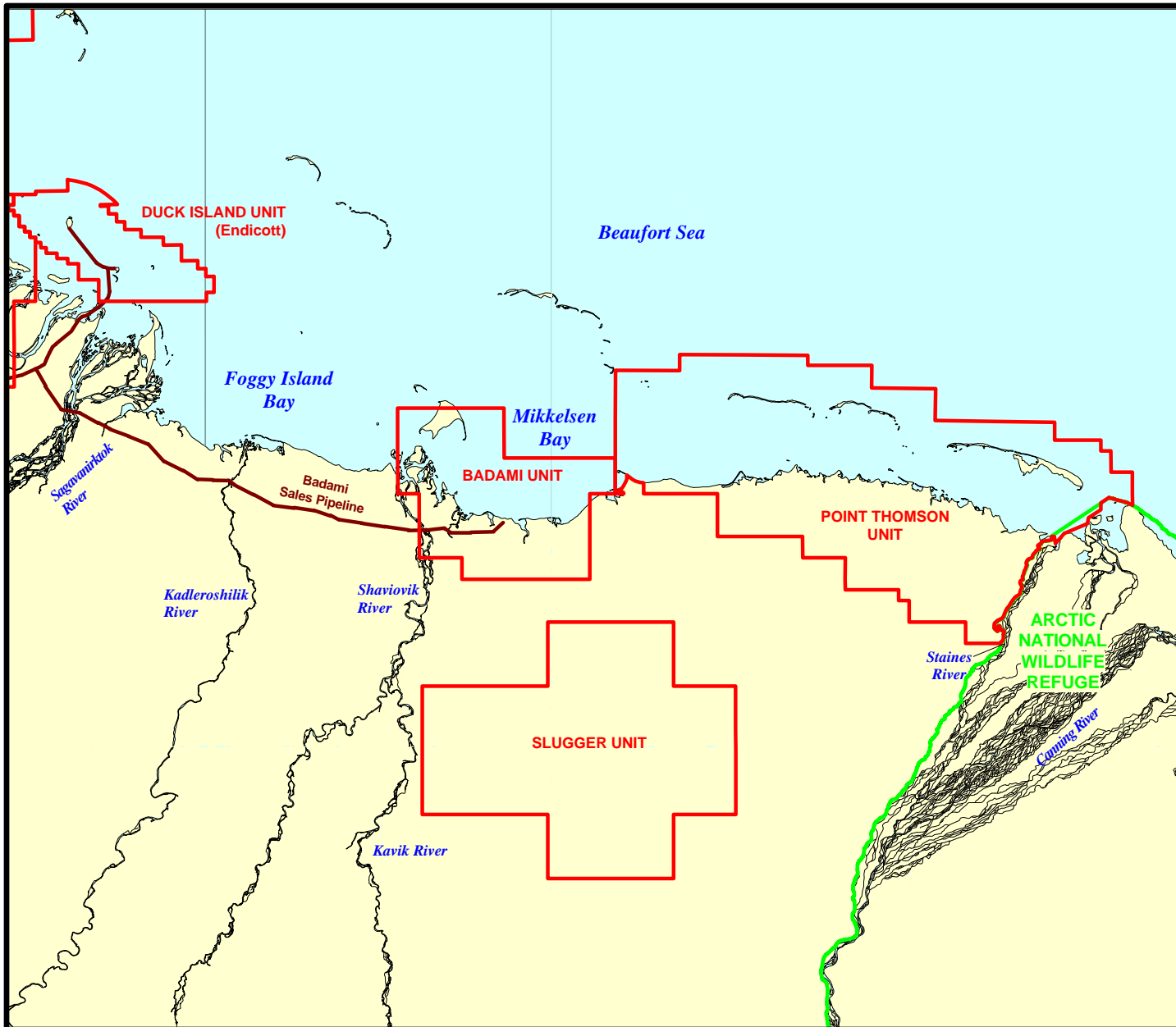
- ◆ Section 1.0 Introduction
- ◆ Section 2.0 Field Documentation
- ◆ Section 3.0 Field Instruments
- ◆ Section 4.0 Surface Water Sampling
- ◆ Section 5.0 Waste Management

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**Point Thomson Gas
Cycling Project**

Figure 1

**Point Thomson
Vicinity Map**



Base maps provided by BPXA
Cartography.

URS

Anchorage, Alaska

2.0 FIELD DOCUMENTATION

Field notebooks provide a means for recording activities performed at a site. They are intended as a record of data, with observations sufficient to enable reconstruction of events that occurred during field activities. All notes will be entered in an organized, factual, detailed, and descriptive manner.

All information will be recorded with indelible ink in a bound notebook with sequentially numbered pages. The top of each page of the notebook will be labeled with the date and site name. The bottom of each page will be signed and dated. If less than a full page is used, a diagonal line will be drawn across the remainder of the page.

At the start of each new day, the site name, the date and time, the names of the field crew, and the weather conditions will be recorded at the top of a new page in the field notebook.

Surface water sampling information will also be recorded in the field notes. The following sample location information will be recorded for each surface water sample:

- ◆ Sample date, time, and type
- ◆ Location identification number
- ◆ Sample identification number
- ◆ Photograph number (each sample location will be photographed)
- ◆ Sample location coordinates and/or approximate distance from two known locations
- ◆ Sampler names

The following observations will be documented for each surface water sample location:

- ◆ Sketch and/or description of sample location
- ◆ Water color and clarity
- ◆ Pond size (dimensions/approximate depth)
- ◆ Connection/communication with other water bodies
- ◆ Appearance of bottom sediment and surrounding sediment
- ◆ Vegetation presence
- ◆ Presence or absence of odor or sheen
- ◆ Observations of aquatic life

The following field measurements (results and units) will be recorded for each surface water sample location:

- ◆ pH
- ◆ Conductivity
- ◆ Dissolved Oxygen (DO)
- ◆ Temperature °C
- ◆ Salinity

Notebooks will also include documentation of any maintenance performed on field equipment used during the field activities. In addition, any uncontrollable conditions that may affect sample integrity (e.g., weather, air quality) will be recorded. The field notes will be archived upon completion of the project, and will be available to XOM upon request.

3.0 FIELD INSTRUMENTS

Calibration and proper maintenance of field instruments are critical to obtaining acceptable data. Improper calibration or failure of an instrument in the field may result in improper choice of sample locations, failure to detect contamination, and inefficient and inadequate segregation of clean material from contaminated material. The manufacturers' calibration instructions will accompany field instruments so that field personnel can perform the proper calibration procedures.

The following general procedures will be used to calibrate and maintain field instruments:

- ◆ Field instruments will be calibrated before and upon completion of each workday.
- ◆ At a minimum, operation, maintenance, and calibration will be performed in accordance with the instrument manufacturer's specifications.
- ◆ All standards used to calibrate field instruments will meet the minimum requirements for source and purity, as recommended in the equipment's operation manual.
- ◆ Acceptance criteria for calibration will be set within the limits put forth in the operation manuals.
- ◆ The dates, times, and results of all calibration and repairs to field instruments will be recorded in the field notebook.

To avoid and/or minimize breakdown of an instrument in the field, the following practices will be employed:

- ◆ Instrument users will be trained in the proper calibration and operation of the instruments and will read the operation manuals before operating the instruments.
- ◆ Users will be trained in routine maintenance, including battery and lamp replacement, lamp and sensor cleaning, battery charging, and proper handling and storage.
- ◆ Instrument operation and maintenance manuals and extra expendable items (e.g., batteries, lamps) will be available at the site.
- ◆ Field instruments will be calibrated and inspected before being taken to the site.

A Horiba® probe, or similar instrument, will be used to measure pH, conductivity, DO, temperature, and salinity at each surface water sample location prior to sample collection. The measurements will be obtained by inserting the probe of the hand-held meter directly into the surface water, taking care to not disturb the sediments, and reading the liquid crystal display after the meter has stabilized.

4.0 SURFACE WATER SAMPLING

Up to 15 surface water samples, including two duplicate samples will be collected from the perimeters of marine, estuarine, and fresh water bodies in the vicinity of the Point Thomson Unit #3 gravel pad and proposed pad expansion area. These samples will be collected to provide representative baseline data for potential receiving waters as part of the NPDES permitting process. Figure 2 provides a photograph of the general area from which the samples will be collected.

4.1 Laboratory Analysis

Table 4-1 summarizes the analytes for which each sample will be analyzed, the analytical methods used, and the applicable holding times. Table 4-2 identifies the sample containers and preservatives used for each analyte.

Table 4-1. Analytes, Methods, and Holding Times

Analyte	Analytical Method	Holding Times	Analyte	Analytical Method	Holding Times
Ammonia (NH ₃)	EPA 350.2	28 days	Polynuclear Aromatic Hydrocarbons (PAHs)	8270 SIM	7 days -extraction 40 days -analysis
Biochemical Oxygen Demand (BOD)	EPA 405.1	48 hours	Total Organic Carbon (TOC)	EPA 415.1	28 days
Chemical Oxygen Demand (COD)	EPA 410.4	28 days	Total Suspended Solids (TSS)	EPA 160.2	7 days
Metals – Arsenic (As), Barium (Ba), Calcium (Ca), Chromium (Cr), Lead (Pb), Magnesium (Mg), Nickel (Ni), Sodium (Na), Zinc (Zn)	EPA 200.7/ 200.8	180 days	Volatile Organic Compounds (VOC)	EPA 8260B	14 days

Table 4-2. Sample Containers and Preservatives

Parameter	Sample Container	Preservative*	Number of Containers per Sample
Ammonia and Chemical Oxygen Demand	1 L polyethylene	H ₂ SO ₄	1
Biochemical Oxygen Demand and Total Suspended Solids	1 L polyethylene	None	1
Total Organic Carbon	250 ml amber glass	HCl	1
Metals	250 ml polyethylene	None	1
Polynuclear Aromatic Hydrocarbons	1 L amber glass	None	2
Volatile Organic Carbon	40 ml VOA vial	HCL	3

*All samples will be stored and shipped at 4° ± 2°C

H₂SO₄ – Sulfuric Acid

HCl – Hydrochloric Acid

L – liter

ml – milliliter

4.2 Sample Collection

Prior to collecting surface water samples for laboratory analysis at each sample location, field personnel will record field measurements as detailed in Section 2.0. After recording field measurements, field personnel will submerge pre-cleaned EPA-specified sample containers at each location, taking special care to prevent the loss of any preservative that may be in the sample containers and to minimize disturbance to sediment at the sample location. The lids of each container will be secured as each is filled. To reduce the potential for sample cross-contamination, field personnel will change sampling gloves between sample locations.

4.3 Labels and Sample Identification

Self-adhesive labels will be attached to the outside of all surface water sample containers. The following information will be provided in waterproof ink on each sample label:

- ◆ A unique sample number
- ◆ Sampling date and time
- ◆ Analysis
- ◆ Sampling personnel
- ◆ Sample method
- ◆ Preservative (if applicable)

The unique sample numbers that will be used to identify each surface water sample and field duplicate sample will begin with PTU3 (for Point Thomson Unit #3), followed by –SW (to indicate each is a surface water sample), and end with a number denoting the order in which the sample was collected. For example, the unique sample number for the fifth sample will be PTU3-SW5.

4.4 Sample Transport and Chain-of-Custody

Sample transport and chain-of-custody procedures will include the following guidelines:

- ◆ Samples will be packaged and shipped in accordance with U.S. Department of Transportation regulations as specified in 49 Code of Federal Regulations (CFR) 173.6 and 49 CFR 173.24.
- ◆ Individual sample containers will be packed to prevent breakage and transported in a sealed ice chest or other suitable container.
- ◆ Ice will be placed in separate plastic bags and sealed, or gel ice will be used to maintain an ambient sample temperature of approximately 4°C until delivery to the analytical laboratory.
- ◆ Each cooler or container containing samples for analysis will be shipped to the laboratory within 24 hours of being sealed.

- ◆ A sealed envelope containing chain-of-custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- ◆ Signed and dated chain-of-custody seals will be placed on all coolers prior to shipping
- ◆ The shipping containers will be clearly labeled with sufficient information (time and date container was sealed, name of the person sealing the container, and consultant's office name and address) to enable positive identification.
- ◆ Upon transfer of sample possession to the analytical laboratory, persons transferring custody of the sample containers will sign the chain-of-custody form. The shipping container seal will be broken and the receiver will record the condition of the samples.
- ◆ Chain-of-custody forms will be used internally in the lab to track sample handling and final sample disposition.



Figure 2
Point Thomson Unit #3 Gravel Pad and Proposed Expansion Area
Photograph by Aeromap U.S.
(Not to scale)

5.0 WASTE MANAGEMENT

No material or waste will be left at the site. The field team may generate expendable materials such as nitrile sampling gloves, general office-type refuse, and food waste while conducting the surface water sampling. Nitrile sampling gloves have a very low probability of contamination and will be placed into regular trash bags, removed from the site, and placed in a landfill dumpster in Deadhorse. General office-type refuse will be recycled when possible or bagged and placed in a landfill dumpster in Deadhorse. Food waste will be bagged and disposed of in an animal-proof landfill dumpster in Deadhorse. Final disposal of these materials will be in the local North Slope Borough solid waste landfill.

ATTACHMENT 1

Safety, Health and Environmental Plan

POINT THOMSON GAS CYCLING PROJECT

NPDES SURFACE WATER SAMPLING EVENT

SAFETY, HEALTH AND ENVIRONMENTAL PLAN

Prepared for:

ExxonMobil

ExxonMobil Production Company
P.O. Box 196601
Anchorage, AK 99519-6601
and

The Point Thomson Unit Owners

September 23, 2002

Prepared by:

URS

URS Corporation
2700 Gambell Street, Suite 200
Anchorage, AK 99503
26218846.06000

SHE "SHORT FORM" INTERFACE DOCUMENT

1. CONTRACTOR: URS Corporation

2. CONTRACT #: 53551

3. WORK SCOPE (materials & services, organization, personnel & supervision, location(s), customer(s), etc.):

The work performed by URS Corporation on behalf of ExxonMobil Production Company (XOM), involves the collection of field water parameters and surface water samples from marine, estuarine, and fresh water bodies in the vicinity of the proposed Pt. Thomson Unit #3 gravel pad expansion area. The purpose of the work is to collect baseline surface water data from potential receiving waters in support of the National Pollutant Discharge Elimination System (NPDES) permit applications for the proposed project (Point Thomson Gas Cycling Facility) design. Surface water sampling will occur in September 2002. The Point Thomson Unit #3 site is a remote site and is only accessible by air or water this time of year. An Air Logistics helicopter will transport field personnel and equipment to and from the site and will remain onsite during the field sampling event. Field personnel will not remain onsite without a helicopter.

The duration of the fieldwork is expected to be one day and will be staffed by three employees (two URS field crew and one Air Logistics pilot). The URS employees will have attended North Slope Training Cooperative (NSTC) training prior to deployment. URS employees will have personal safety equipment such as safety glasses, work gloves, steel-toed boots, and rain gear. Additionally, the Air Logistics helicopter will be equipped with modern radio communication equipment, survival gear, an emergency locator transmitter (ELT), and a fire extinguisher.

COMMUNICATION:

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URS Project Manager: Dr. Jack Colonell
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URS Field Manager: Sharon Sullivan
(907) 301-7811

5. SPECIFIC SHE HAZARDS:

With the possible exception of drilling mud and cuttings, and sanitary and domestic wastewater discharged in the 1970s and the early 1980s during exploration drilling, there are no other known chemical hazards within the study area water. Physical hazards include cold stress and cold injuries associated with working in the arctic, working around helicopters, and encounters with wild animals such as bears and foxes.

6. ASSURANCE SYSTEMS:

URS Corporation Health and Safety Program
Site Specific Safety, Health and Environmental Plan (Attachment A)
ExxonMobil, U.S. Production Safety Manual

7. SIGNATURES:

The contents of this document are the product of a desktop hazard assessment by management. The undersigned agree that to the best of their knowledge this document is an accurate depiction of the scope of work provided by the contractor; safety, health and environmental risks known about that work scope; and management systems in place to mitigate risks. This document also identifies additional actions to further mitigate risks and the undersigned agree to review these and implement as appropriate.

Dr. Alan Maki (Signature on File) 9/24/02
ExxonMobil Project Manager Date

Gail Gislason (Signature on File) 9/23/02
URS Health and Safety Officer Date

Category	Hazard/Activity	Safeguards in Place to Manage the Hazard/Activity	Interfaces		
			Management System	Whose System	Responsible Person
NORTH SLOPE SAFETY HAZARDS	1. Remote camp hazards	1. North Slope Orientation Training (NSTC: Unescorted) for all field personnel. Site/Facility Orientation (PBU).	ARCO/BPXA “Alaska Safety Handbook” within operated areas.	Contractor. BPXA within operated areas (PBU). Contractor	Contractor Project Manager responsible to ensure their personnel receive required orientation training and follow XOM rules and procedures applicable to their work scope.
	2. Fire hazards	2. Fire extinguishers available at camp and on vehicles and helicopter; training in use of extinguishers and evacuation procedures.	XOM Policy, Recommended Practices, and SOPs		
	3. Cold related injuries	3. Use of appropriate cold-weather gear; training in signs of hypothermia and frostbite. Stop work if symptoms present.	Handbook: North Slope Field Guide for Visitors and Contractors		
	4. Foul weather	4. Stop work, follow evacuation procedures prescribed by Emergency Response Plan.	Contractor’s SHE Management System		
	5. Travel by helicopter	5. Helicopter briefing. Radio, flares, ELT, fire extinguisher and first aid kit carried in helicopter.			
	6. Noise exposure	6. Hearing Conservation Program. Use of Ear Protection around helicopter.			
	7. Bear and other wildlife encounters	7. Bear Training. Bear observation notification procedures.			

Category	Hazard/Activity	Safeguards in Place to Manage the Hazard/Activity	Interfaces		
			Management System	Whose System	Responsible Person
PERMIT AND PROCEDURE CONTROLLED HAZARDS	<ol style="list-style-type: none"> 1. Work within BPX(A) operated areas (Badami & PBU). 2. Flammable and Combustible Fluid Transfer (engine oils, gasoline) 	<ol style="list-style-type: none"> 1. North Slope Orientation Training for all personnel before initiating work (in PBU). 2. Fluid Transfer Procedure 	<p>ARCO/BPXA “Alaska Safety Handbook” within operated areas.</p> <p>XOM Policy, Recommended Practices, and SOPs</p>	Contractor. BPXA within operated areas.	Contractor Project Manager responsible for ensuring personnel receive training and follow rules and procedures applicable to their activities.
ENVIRONMENTAL IMPACT HAZARDS	<ol style="list-style-type: none"> 1. Spills (fluid transfer, improper liner use etc.) 2. Wildlife Encounters 3. Waste Management and Disposal 	<ol style="list-style-type: none"> 1. Training on fluid transfer procedure (NS Orientation). 2. Personnel to avoid all contact with wildlife. 3. Contractor to minimize, segregate, containerize, and label solid waste, and ensure personnel are trained appropriately. All solid waste to be removed from site and properly disposed. 	<p>ARCO/BPXA “Alaska Safety Handbook” within operated areas.</p> <p>XOM Policy, Recommended Practices, and SOPs</p>	Contractor. BPXA within operated areas.	Contractor Project Manager responsible for ensuring personnel receive training and follow rules and procedures applicable to their activities.

Category	Hazard/Activity	Safeguards in Place to Manage the Hazard/Activity	Interfaces		
			Management System	Whose System	Responsible Person
EMERGENCY AND MEDICAL	1. First Aid, Medical Treatment, Medevac	1. Contractor personnel to be First Aid/CPR trained. For serious accidents/illnesses, BPXA/North Slope to provide medical stabilization or treatment and medevac to Anchorage (reimbursed by contractor).	BPXA	BPXA	Contractor. BPXA within operated areas.
	2. Incident Reporting and Investigation a) Investigation of Incidents b) Emergency Response	2. Report all incidents to XOM PM. XOM to investigate incidents per SOP (contractor to participate). In addition, Contractor to contact BPXA for environmental incidents occurring within BPXA operated areas (PBU).	XOM SHE Plan, Emergency Management Plan, and Contingency Plans (BPXA plans in operated areas)	XOM (BPXA in operated areas)	Contractor Project Manager responsible for ensuring personnel receive training and follow rules and procedures applicable to their work
	3. Reporting SHE Data to XOM PM as required.				
	4. Return to work after illness/injury.				
	5. Fitness	3. Contract Language.	Contractor's SHE Management System	Contractor	Contractor Project Manager
	6. OSHA Documentation	4. Contractors Return to Work Policy. 5. Contractors Medical surveillance program. Medical monitoring, pre-job physicals, Doctor release. 6. Contractor OSHA 300 Log			

Category	Hazard/Activity	Safeguards in Place to Manage the Hazard/Activity	Interfaces		
			Management System	Whose System	Responsible Person
MANAGEMENT SYSTEMS	<ol style="list-style-type: none"> 1. Communications: Points of contact with XOM 2. Competency (SHE and Work Program) 3. Roles and Responsibilities 4. Safety management 5. Fatigue 6. Drug and alcohol program 	<ol style="list-style-type: none"> 1. Site Specific SHE plan 2. Training Programs, Competency System, Performance Evaluations, Continuing Education 3. Job descriptions 4. Contractor Safety Management Policy and Procedures Manual 5. Budget 12-hour days 6. Contractor's program 	<p>Contractor defines points of contact.</p> <p>Contractor's SHE Management System as provided</p> <p>Contractor</p>	Contractor	Contractor Project Manager to ensure personnel receive site orientation and contact list
WORK PRACTICES AND CONTROLS	<ol style="list-style-type: none"> 1. Work Programs and Procedures 2. Pre-work Risk Assessment 3. Management of Change (design, equipment, chemical, procedure) 4. Information/ Documentation 	<ol style="list-style-type: none"> 1. Written work procedures, standards, drawings 2. Contractors pre-work SHE plan 3. Contractors Management of Change procedure 4. Information reporting and documentation to management (daily, job, etc.) 	<p>Contractor & XOM agree to all</p> <p>Contractor's SHE Management System</p> <p>Contract Language</p>	<p>Shared</p> <p>Contractor</p>	Contractor & XOM Project Managers agree to work scope and written work procedures before commencing work.
CONTRACTOR SUPPLIED EQUIPMENT	<ol style="list-style-type: none"> 1. Hand-tools 2. Trucks/Vehicles 3. Materials and Services in compliance with applicable industry standards and specifications 4. Maintenance and operability of equipment 	<ol style="list-style-type: none"> 1. Inspection program. 2. Licenses, driver competency. 3. Inspection program, record keeping. 4. Inspection and records. 	<p>Contractor's Work Plan</p> <p>Contractor's SHE Management System</p>	Contractor	Contractor management to ensure personnel receive briefing on Safety Plan and Work Plan.



APPENDIX A
SITE SPECIFIC SAFETY, HEALTH AND
ENVIRONMENTAL PLAN



SAFETY, HEALTH AND ENVIRONMENTAL (SHE) INTERFACE DOCUMENT

CONTRACTOR: URS Corporation

CONTRACT# 53551

WORK SCOPE:

ExxonMobil Production Company and the Point Thomson Unit owners plan to develop the Point Thomson Gas Cycling Project for production and transport of sales-quality gas condensate to the Trans-Alaska Pipeline System.

Based on the need to perform physical and chemical sampling in support of construction permits for the proposed Point Thomson Gas Cycling Facility, investigative surface water sampling will be performed from the perimeters of marine, estuarine, and fresh water bodies in the vicinity of the proposed Point Thomson Unit #3 expanded gravel pad area. The sampling work will be performed in September 2002, and will involve the measurement of water field parameters and the collection of up to 15 surface water samples for analysis. The sample results will provide baseline data of potential receiving waters as part of the National Pollutant Discharge Elimination System (NPDES) permitting process.

The proposed Point Thomson Central Processing Facility is located along the Alaska Beaufort Sea coast, approximately 46 miles east of Prudhoe Bay, on the North Slope of Alaska. The Point Thomson Unit #3 study site is not road accessible and a helicopter will be used to transport personnel and field equipment to the remote site.

TRANSPORTATION AND COMMUNICATIONS:

Transportation of field crews and equipment to the Point Thomson Unit #3 site will occur via helicopter and vehicles will be used to transport personnel and equipment to the airport and warehouse/shipping areas. Field personnel will be equipped with hand-held radios and cellular phones to allow communication with emergency, helicopter, and operating unit personnel.

Helicopter Travel

The helicopter pilot is in complete charge of the aircraft and passengers at all times during flight operations and shall conduct an emergency briefing prior to every flight. When traveling by helicopter, field personnel will follow these safety procedures and requirements at all times:

- Do not smoke in the helicopter or on the designated landing areas.
- Keep clear of the designated landing area or helipad until the helicopter has landed. Do not use the landing area as a staging area for personnel or equipment.
- Do not board or leave the helicopter until the pilot has signaled that it is safe to do so.



- Do not walk under the tail rotor or tail boom. If it is necessary to walk around the helicopter, do so within sight of the pilot and around the front of the aircraft only.
- Firmly grip all lightweight equipment and loose articles of clothing (including hats) when walking to and from the aircraft.
- Remain in your seat with seatbelt fastened at all times during the flight unless otherwise directed or approved by the pilot.
- Do not distract the pilot with unnecessary conversation or actions.
- Do not throw anything out of the helicopter during flight.
- Do not remain on board the aircraft during refueling operations.
- Wear hearing protection when loading, boarding, and riding in the helicopter. Wear eye protection when loading or boarding the helicopter.

The helicopter will have on-board emergency survival gear and emergency communication equipment as required by XOM policy. The helicopter will remain onsite at all times during the field event; field personnel will not remain at the remote site without the helicopter. Field team members have the right to and are expected to refuse flight if conditions seem unsafe.

Vehicle Travel

When traveling by vehicle, field personnel will follow these safety procedures and requirements at all times:

- Have a valid and appropriate driver's license for the vehicle being operated.
- Circle the vehicle before operation to check vehicle condition and to identify any unknown or hidden obstacles.
- Drive defensively, safely, courteously, and responsibly.
- All passengers to wear seat belts and ANSI approved safety glasses with side shields while the vehicle is in motion.
- Comply with all posted speed limits and drive according to the conditions.
- Have headlights on whenever the vehicle is being driven.
- Where possible, park the vehicle in a manner that will eliminate the need to back the vehicle upon departure. If backing is necessary, the driver should ensure that the path of travel is clear before backing.
- Do not initiate cell phone calls while driving a vehicle. Drivers may acknowledge incoming cell phone calls but must defer conversation until the vehicle can be brought to a full stop in a safe location.
- All accidents shall be reported immediately to the appropriate security department, the XOM and URS Project Managers.



SITE SPECIFIC HEALTH AND SAFETY INFORMATION:

URS Safety Management Standards (SMSs) for hazards anticipated during this field program are included as Attachment 1. The SMSs included in Attachment 1 are as follows:

- Regulatory Inspections (SMS #001)
- Worker Right to Know (SMS #002)
- Emergency Action Plans (SMS #003)
- Corrosive and Reactive Materials (SMS #009)
- Flammable and Combustible Liquids and Gasses (SMS #015)
- Hand Tools and Portable Equipment (SMS #016)
- Hazardous Waste Operations (SMS #017)
- Medical Screening and Surveillance (SMS #024)
- Noise and Hearing Conservation (SMS #026)
- Work Over Water (SMS #027)
- Personal Protective Equipment (SMS #029)
- Remote Travel Health and Safety (SMS #036)
- Respiratory Protection (SMS #042)
- Back Injury Prevention (SMS #045)
- Subcontractor Health and Safety Requirements (SMS #046)
- Biological Hazards (SMS #047)
- DOT Shipping (SMS #048)
- Injury, Illness, and Incident Reporting (SMS #049)
- Marine Safety and Boat Operations (SMS #053)
- Office Ergonomics (SMS #054)
- Health and Safety Training (SMS #055)
- Vehicle Safety Program (SMS #057)
- Cold Stress (SMS #059)

All field personnel will carefully read and understand this Safety, Health and Environmental Plan as well as the applicable sections in XOM's *U.S. Production Safety Manual*:

- General Safety
- Emergency Preparedness and Survival
- First Aid
- Fire Safety
- Personal Protective Equipment
- Water Operations
- Transportation

In addition, the on-site team leader will conduct daily field safety briefings before personnel travel out to the work site. The meetings will discuss safety concerns and mitigation measures concerning the project. Up-to-date observations of weather, wind chill, and wildlife presence will be discussed among the field team leader and field crew personnel.



Chemical Hazards

The potential chemical hazards associated with this project are minimal. The surface water samples to be collected are not likely to be contaminated with diesel, weathered crude oil, or other components of drilling waste. Dermal exposure to contaminated material will be minimized through the use of chemical-resistant gloves and other appropriate personal protective equipment (PPE). Eating, drinking, and smoking will not be allowed during sampling activities.

Additionally, some chemicals will be used to preserve samples or decontaminate equipment, including hydrochloric acid, sulfuric acid and Alconox®. The material safety data sheets (MSDS) for these and all other potentially hazardous chemicals will be kept onsite at all times. Gloves and other appropriate PPE will be used when handling chemicals, and field team members will familiarize themselves with the hazards and risks listed in the MSDS.

Physical Hazards

The physical hazards associated with the project scope include motor vehicle accidents, helicopter accidents, hypothermia and frostbite associated with cold wet weather, encounters with wildlife, and slips and falls.

Hypothermia and Cold Injuries. Safety Management Standard SMS #059, Cold Stress (Attachment 1), details the symptoms of, treatment for, and how to avoid cold injuries such as frostbite and hypothermia. Should the beginning signs of either hypothermia or frost bite be observed, the affected worker will immediately proceed to the helicopter to warm up. Indication of adverse effects includes, but is not limited to:

- Uncontrolled shivering,
- Slurring of speech,
- Loss of motor skills, and
- Burning or tingling extremities (frost nip or frostbite).

To avoid cold injuries, workers will:

- Wear, or have readily available, appropriate clothing for the potential weather conditions.
- Constantly monitor team members for signs of cold stress.
- Warm up in the nearest available shelter (i.e., helicopter) at regular intervals, before cold stress symptoms occur.
- Immediately change into dry clothes when current clothing becomes wet (e.g., by perspiration, precipitation, or splashing).

If an individual observes the beginning signs of hypothermia or frostbite, the affected worker will immediately proceed to the warm-up shelter. If more than one team member experience symptoms, work will be stopped until conditions improve or engineering controls are put into place.

Encounters with Wildlife. Encounters with polar bears are possible any time of year in Beaufort Sea coastal areas. Brown bears as well as caribou, musk ox, and insects may be encountered in the fall.



Heightened awareness for possible bear encounters will form the basis of personnel control and safety. During day-to-day activities, all personnel will be reminded to be constantly alert to bears in the nearby vicinity. Food and other items that might attract bears will be controlled and removed from the site at the end of each day's activities.

When conducting fieldwork, team members must frequently look up from their activity and scan the area for approaching bears. This practice will help to prevent surprise encounters with bears and, if a bear is sighted, allow the field team to assess the situation. When traveling away from the safety of the helicopter, field personnel will work in pairs and will carry hand-held radios to communicate with the aircraft.

If a bear is seen or recent bear sign identified, team members will go directly to the helicopter and depart the location, leaving sampling equipment and other personal effects behind if necessary. Personnel will immediately notify the on-site team leader of the bear's location and direction of travel. They will also notify the URS and XOM Project Managers. Work will not continue until the bear leaves the area or an authorized bear hazer is on site.

Foxes, although not as immediately dangerous as bears, are of great concern due to rabies. Infected animals often lose their fear of humans and may be more likely to approach field personnel. Any physical contact, as well as the observation of sick animals must be reported to XOM Project Manager. If a fox touches your clothing, do not touch that part of your clothing, as you could become contaminated yourself. Wildlife must not be approached, fed, harassed, or harmed.

Other large animals, such as caribou or musk ox, may also be encountered during work. Field personnel shall take care not to startle any large animal, and should back away in a non-confrontational manner. It will not likely be necessary, however; work should be stopped for a short while if the animal appears to be threatened by worker activity.

During fall fieldwork, personnel may encounter a wide variety of insects including bees and mosquitoes. Field personnel are encouraged to use head nets, and/or insect repellent when mosquitoes or other biting insects are present. Insect repellent containing DEET should be applied only to clothing and should not be applied directly to the skin. Citronella insect repellent can be applied to the skin.

Slips and Falls. The terrain surrounding the gravel pad area is uneven. To prevent physical injury, the following preventative measures will be adhered to:

- Personnel will use caution when walking around the site; do not take long strides or change direction quickly. Attempt to keep your centerline over your mid-stride.
- Footwear with good traction will be worn to minimize slipping hazards.
- If it is necessary to wade in ponded areas, the buddy system will be implemented.
- Caution will be exercised to avoid entrapment in mud or quicksand.



PERSONAL PROTECTIVE EQUIPMENT:

The level of personal protective equipment for the sampling activities is **Level D**, to include safety glasses, work gloves, hearing protection as needed, and steel-toed safety boots.

EMERGENCY RESPONSE:

The purpose of this section is to provide guidance in preparing for contingency or emergency situations during field activities. Accidents can, and do, happen. However, with adequate planning and preparedness, resulting consequence can be minimized or prevented.

Emergency preparedness starts with advanced planning. It requires anticipation of potential problems or hazards. Proper emergency preparedness involves use of the project health and safety plan that may address emergency situations. It involves training, site orientation of personnel, medical information of personnel, and availability of emergency equipment and services.

Emergency Action Plan

This section describes the steps to be taken if an emergency occurs. In the event of an emergency, the Badami Facility contact list (Attachment 2) provides contact numbers for the nearest medical, environmental, and emergency response team services to the Point Thomson Study area.

- Communications – Radio equipment will be installed in the helicopter and cellular phones will be carried to the work site to communicate any fire, medical, or environmental emergencies.
- Fire – The vehicles and helicopter are equipped with fire extinguishers. Personnel should first notify Badami of the fire, by radio or telephone (907-659-1200), and then if they can fight the fire comfortably, do so. If not, communicate needs with rescuers using the radio or telephone. Personnel should make sure that they have warm clothing and move to a safe distance to wait for pick up.
- Medical – All vehicles and the helicopter are equipped with First Aid kits. If the injury requires further medical attention, call for help on the radio. The nearest medical support facility to Point Thomson is the Badami Medical Clinic (907-659-1327). If an injury occurs in a camp or at a hotel, go to the front desk for assistance. All injuries, no matter how small, must be reported to the XOM Project Manager (907-564-3702) and to the URS Health and Safety Officer Gail Gislason (206-438-2700). In addition, the incident will be reported to the BPXA HSE Shared Resource for incidents that occur in an operated area.
- Environmental Spills – A positive impact on the environment is the goal of all XOM participants. A spill is any incident that releases a contaminant into the environment. Nothing may be poured into the water or on the tundra and all food and containers must be taken back to the camp area for disposal. If field personnel create or witness an emergency situation, Spill Response (907-659-1200) must be contacted. Spill Response will then contact the proper departments.



Emergency Equipment/First Aid

The emergency equipment to be located on site in the helicopter includes a first aid kit, air horn, emergency eyewash, an ABC-type fire extinguisher, potable water, anti-bacterial soap, an emergency locator transmitter (ELT), and radio equipment.

Spill and Release Contingencies

If a small spill occurs, the release will be handled using on-site spill containment materials. All spills will be reported to the XOM Project Manager. BPXA will be contacted at (907) 659-5700 if a spill occurs in an operated area.



Incident Reporting and Investigation

Any work-related incident, accident, injury, illness, exposure, or property loss must be reported to the XOM and URS primary contacts listed below. Should a recordable incident, agency-reportable spill, or significant near miss occur, the primary contacts shall be notified within 24 hours. In the event a primary contact is not available, the secondary contact will be notified.

XOM Alaska Contact:

Primary – Al Maki (907) 564-3702 Work

Secondary – Jack Williams (907) 564-3689 Work, (907) 223-9202 Cell,
(800) 246-4041 Pager, (907) 336-3454 Home

XOM Houston Contact:

Primary – Randy Buckley (281) 654-4054 Work, (832) 715-7901 Cell

Secondary – Bryan Wesselink (281) 654-4722 Work

URS Alaska Contact:

Primary – Jack Colonell (907) 644-5714 Work

Secondary – Bryan Trimm (907) 261-6710 Work

All motor vehicle accidents must also be reported. In the event of an incident or injury, a URS Incident Report Form, (attached to this plan), must also be filled out and forwarded to the URS Project Manager. In addition, the incident will be reported to BPXA HSE Shared Resource for incidents that occur in an operated area.

Dr. Alan Maki (Signature on File)

**XOM CONTRACT ACCOUNTABLE
MANAGER**

DATE: 9/24/02

Dr. Jack Colonell (Signature on File)

**CONTRACTOR'S ACCOUNTABLE
MANAGER**

DATE: 9/24/02

ATTACHMENT 1
SAFETY MANAGEMENT STANDARDS

URS SAFETY MANAGEMENT STANDARD

Inspections by Regulatory Agencies

1. Applicability

This program applies to URS office and field operations.

2. Purpose and Scope

Representatives of regulatory agencies may have statutory authority to evaluate URS operations for compliance with health and safety regulations. URS personnel are to cooperate with all such inspections. This procedure provides guidelines for responding to the inspector and for documenting inspection activities.

3. Implementation

Office Locations Implementation of this procedure is the responsibility of the Office Manager.

Field Activities Implementation of this procedure is the responsibility of the Project Manager.

4. Requirements

A. Obtaining Positive Identification

Request formal identification (photo identification card) from any regulatory agency representative. Call the agency if there is any question regarding the identity of the individual (independently obtain the agency's number; don't use a number provided by the representative). Obtain a business card from the inspector for URS records.

B. Warrants

Do not require an inspector to obtain a warrant prior to conducting an inspection.

C. Health and Safety Notification

Contact the local URS Health and Safety Representative or URS Health and Safety Manager immediately upon confirming the identification of the representative.

D. Opening Conference

1. Request an opening conference if one is not initiated by the inspector.

URS SAFETY MANAGEMENT STANDARD

Inspections by Regulatory Agencies

2. Use the opening conference to determine why the inspector is conducting the inspection.
3. Take good notes during the conference.

E. Inspection Activities

1. Escort the inspector at all times, taking him/her directly to the area of interest.
2. Answer all questions honestly, but do not volunteer information.
3. Do not argue with or attempt to mislead the inspector.
4. Resolve violative conditions immediately, while the representative is on site, if possible.
5. Make sure the inspector has appropriate qualifications to enter high hazard areas.
6. Take good notes during the inspection and take pictures where the inspector takes pictures.
7. Inspectors generally have the right to interview employees if they do not interrupt operations.

F. Closing Conference

1. Request a closing conference if one is not initiated by the inspector.
2. Use the closing conference to determine what regulatory violations the representative found, if any.
3. Do not try to negotiate during the closing conference.
4. Take good notes during the conference.

G. Post-Inspection Activities

1. Immediately contact URS Health and Safety Manager and communicate the results of the inspection. The URS Health and Safety Manager will provide additional instructions regarding the inspection.
2. Debrief any employees who were contacted by the representative; all discussions should be reduced to notes.

URS SAFETY MANAGEMENT STANDARD

Inspections by Regulatory Agencies

3. All follow-on activities associated with the inspection will be coordinated by the Group Health and Safety Manager and appropriate legal counsel. Local URS employees are not to conduct any follow-on activities without the express consent of the URS Health and Safety Representative.

5. Documentation Summary

Provide the following documents to the URS Health and Safety Manager:

- A. Inspector's business card.
- B. All materials provided by the inspector.
- C. All notes relating to the inspection, opening conference, closing conference, and debriefings.
- D. All photos from the inspection, with explanatory notes.

6. Resources

U.S. OSHA - [Field Inspection Reference Manual](#)

URS SAFETY MANAGEMENT STANDARD

Worker Right-to-Know (Hazard Communication)

1. Applicability

This procedure applies to URS office and field operations.

2. Purpose and Scope

The worker right-to-know program provides URS personnel with information and training about safety and health hazards associated with the chemicals they might encounter in the workplace. This procedure describes how chemical safety hazards are communicated to URS personnel working in offices and at field site locations, and how information is to be provided to employees of other employers working at the location. The requirements include steps to acquire this information, maintain it, and train everyone to use it.

3. Implementation

Office Locations: Implementation of this program is the responsibility of the Office Manager.

Field Activities: Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Hazardous Material Inventory

1. Maintain a hazardous material inventory that lists all of the hazardous materials used at this workplace. Use chemical names consistent with the applicable MSDS's.
2. File a copy of the chemical inventory in the Safety Filing System.

B. Material Safety Data Sheets (MSDS's)

1. Obtain a MSDS for each chemical before it is used.
2. Review each MSDS when it is received to evaluate whether the information is complete and to determine if existing protective measures are adequate.
3. Maintain a collection of all MSDS's where they are accessible at all times.

URS SAFETY MANAGEMENT STANDARD
Worker Right-to-Know (Hazard Communication)

4. Replace MSDS sheets when updated sheets are received. Communicate any significant changes to those who work with the chemical.
5. MSDS's are required for all hazardous materials used on site by project personnel.

C. Labels

Label all chemical containers with:

1. Identity of the hazardous chemical(s),
2. Appropriate hazard warnings, and
3. Name and address of the chemical manufacturer, importer, or other responsible party.

D. Hazardous Nonroutine Tasks

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, provide each employee with information about hazards to which they may be exposed during such an activity.

This information will include:

1. Specific chemical hazards.
2. Protective/safety measures which must be utilized.
3. Measures that have been taken to lessen the hazards including ventilation, respirators, presence of another employee and emergency procedures.

E. Informing Contractors/Subcontractors

Provide contractors/subcontractors 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.

URS SAFETY MANAGEMENT STANDARD
Worker Right-to-Know (Hazard Communication)

3. Location of URS MSDS's and written chemical inventory.

F. Training

1. Conduct training of all employees potentially exposed to hazardous materials on the following schedule:
 - a. Before new employees begin their jobs.
 - b. Whenever new chemicals are introduced into the workplace,
or
 - c. Annually thereafter.
2. This training will include:
 - a. Applicable regulatory requirements.
 - b. Names of those responsible for implementing this program.
 - c. Location of the program, inventory and MSDS 's.
 - d. Chemicals used, and their hazards (chemical, physical and health).
 - e. How to detect the presence or release of chemicals.
 - f. Safe work practices.
 - g. How to read an MSDS.
3. Document the training.

5. Documentation Summary

- A. File these records in the Office Safety Filing System
 1. Chemical Inventory.
 2. Location of the MSDS inventory.
 3. Training records.
 4. Contractor/Subcontractor notifications.
- B. File these records in the Project Safety File.

URS SAFETY MANAGEMENT STANDARD
Worker Right-to-Know (Hazard Communication)

1. Chemical Inventory.
2. Location of the MSDS inventory.
3. Training records.
4. Contractor/Subcontractor notifications.

6. Resources

- A. U.S. OSHA Technical Links - Hazard Communication
(<http://www.osha-slc.gov/SLTC/hazardcommunications/index.html>)
- B. U.K. - Control of Substance Hazardous to Health - Regulations

URS SAFETY MANAGEMENT STANDARD

Emergency Action Plans

1. Applicability

This procedure applies to URS office and field operations.

2. Purpose and Scope

This procedure establishes policy, assigns responsibilities, and provides guidance to URS offices/field projects regarding emergency action. It includes general information on actions to be taken by URS management and employees in the event of a fire or other emergency that may endanger life or property.

The objectives of this procedure are to:

- A. Promote a fast, effective reaction in coping with emergencies.
- B. Save lives and avoid injuries and panic.
- C. Restore order and conditions back to normal levels with a minimum of confusion and as promptly as possible.

3. Implementation

Office Locations- Implementation of this program is the responsibility of the Office Manager.

Field Activities- Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Emergency Action Plan Development

1. Gather Information

Each URS office/project must develop an emergency Action Plan tailored to its specific situation. Office Managers will check with their building manager or landlord regarding evacuation procedures they may have in place and incorporate these procedures into the emergency Action Plan. Project EAPs must comply with client requirements and specifications. The Plan must contain the following:

- a. Reporting Fires and Other Emergencies

URS SAFETY MANAGEMENT STANDARD
Emergency Action Plans

Describe the procedures that personnel should follow to report emergencies. List emergency telephone numbers for fire, paramedics and police. Include local prefixes on emergency numbers, if required, such as 9-911.

b. Alarm System

Describe the emergency alarm system for the building/site as applicable. Include the description and location of fire alarm pull boxes, and visual and audible alarms. If a public address (PA) system is used to notify occupants of emergencies, include the procedures to activate the PA system, such as calling the receptionist or building manager's office, and a description of the announcements that will be made.

c. Evacuation Routes and Procedures

Develop a map or description of the evacuation routes and emergency exits to be use. A description of the building emergency lighting system and exit signs may also be included. Evacuation route maps may be posted in the offices. There should be a primary and alternate evacuation route and exit from each work area.

Describe procedures regarding the use of elevators, if applicable. In most cases elevator use is prohibited during an emergency. The building manager should be consulted for these procedures.

Include procedures to determine that no employees have been inadvertently left behind.

d. Critical Equipment/Operations Procedures

Designate personnel responsible for shutting down critical equipment and the procedures for doing so, if applicable.

e. Assisting Disabled Personnel

Describe the provisions that have been made for notifying and assisting personnel with disabilities during an emergency. Such provisions are to accommodate personnel in wheelchairs or those who are temporarily disabled, such as personnel on crutches.

URS SAFETY MANAGEMENT STANDARD
Emergency Action Plans

f. Personnel Accounting Procedures

Designate a primary and alternate assembly area for personnel who are evacuating. Require sufficient distance so that personnel will not be exposed to fire or debris hazards, or traffic, nor interfere with emergency responders.

Designate an individual and an alternate with the assigned responsibility for taking a headcount in the assembly area and reporting missing personnel to emergency responders.

Define the procedures on how employees will be informed that it is safe to re-enter the building or to leave for home.

g. Rescue and Medical Duties

Include the statement that "URS does not expect or encourage its employees to engage in firefighting, medical treatment, rescue, or other emergency response. Such activities should only be performed by properly equipped and trained emergency responders. URS recognizes that some of its personnel may have received training in first aid and cardiopulmonary resuscitation (CPR) and may wish to perform these duties on injured personnel."

B. Posting

1. Post the Emergency Action Plan where it is available to all employees.
2. Post evacuation maps at all exits and points of egress.

C. Training

Train all employees regarding the requirements of the Emergency Action Plan.

5. Documentation Summary

A. Office

File these records in the Office Safety Filing System:

1. Emergency Action Plan

URS SAFETY MANAGEMENT STANDARD
Emergency Action Plans

2. Evacuation Maps
3. Training records

B. Field

File these records in the Project Safety File.

1. Emergency Action Plan
2. Evacuation Maps
3. Training records

6. References

- A. U.S. OSHA Standard - [Emergency Action Plans](#) - 29 CFR 1910.38
- B. U.S. OSHA Fact Sheet - [Responding to Workplace Emergencies](#)

URS SAFETY MANAGEMENT STANDARD

CORROSIVE AND REACTIVE MATERIALS

1. Applicability

This program applies to URS office and field operations where corrosive or reactive materials are stored or used.

2. Purpose and Scope

This program provides information regarding the proper methods to store, handle and work with corrosive and reactive materials. This procedure considers a corrosive material as one that has a pH less than 2.0 (acid), or greater than 12.5 (base). A reactive material is a chemical that may be sensitive to shock, or may react with air or water depending upon its makeup.

3. Implementation

Office Locations - Implementation of this program is the responsibility of the Office Manager.

Field Activities - Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Appoint a responsible person who will:

1. Inspect storage areas periodically.
2. Monitor the quantity of corrosive and reactive materials on site as well as those incoming materials.
3. Review work practices utilizing corrosive and reactive materials.

B. Require that all employees working with corrosive or reactive materials, or who are working in close proximity to where such materials are being used or handled, are trained in accordance with [SMS 2](#), "Worker Right to Know".

C. Control the use of corrosive and reactive materials by URS personnel.

1. Order only those materials and quantities that are needed to complete a job.
2. Check incoming corrosive and reactive materials for proper labeling.

URS SAFETY MANAGEMENT STANDARD
CORROSIVE AND REACTIVE MATERIALS

- a. Label materials if needed upon arrival on site.
 - b. Mark reactive materials containers with the date of receipt of the chemical.
3. Check incoming corrosive and reactive materials for materials safety data sheets. If MSDS are not already on file, order them from the manufacturer, distributor or vendor.
 4. Add incoming corrosive and reactive chemicals to the hazardous materials inventory - if not already on the inventory following procedures set forth in [SMS 2](#), "Worker Right to Know".
 5. Do not store any quantity of corrosive or reactive materials except consumer products in an office. These materials are to be stored off-site or at an on-site laboratory or storage area.
- D. Store corrosive and reactive materials appropriately.
1. Store corrosives and reactive materials as indicated on the Material Safety Data Sheet. In general, store these materials:
 - a. In a cool, dry environment, free from extremes of temperature and humidity.
 - b. In a manner that separates them from other materials (including flammables and oxidizers) and from each other.
 1. Separate acids and bases.
 2. Separate reactive materials from acids and bases, and protect from contact with water.
 - c. On materials that are acid resistant (Teflon-coated, plastic, etc.) for small containers.
 - d. Covered, not stacked on one another on acid resistant material - for carboys (approximately 5 gallons/22 liters) in the same manner as small containers.
 - e. On individual racks or securely blocked on skids with closure (plug) facing upward to prevent leakage for drums.
- E. Require that labeling & signage are in place.

URS SAFETY MANAGEMENT STANDARD

CORROSIVE AND REACTIVE MATERIALS

Label containers with the appropriate warning word to indicate the hazard: DANGER; WARNING; CAUTION; CORROSIVE; OXIDIZER.

- F. Use corrosive and reactive materials appropriately.
1. Safe-handling procedures will vary with each operation and type and concentration of the chemical, in all cases review the Material Safety Data Sheet and product information before use.
 2. Use [SMS 29](#) - Personal Protective Equipment when working with or around corrosive and reactive materials.
 - a. Review the MSDS for the chemical used to determine the type of PPE needed.
 - b. Wear the following PPE as a minimum when working with corrosives and reactive materials:
 1. Chemical splash goggles.
 2. Chemical resistant gloves.
 3. Chemical resistant apron.
 3. Obtain medical care immediately in the event of:
 - a. Skin or eye exposure (e.g., splash) to corrosive liquids.
 - b. Inhalation of vapors of corrosive liquids that cause respiratory discomfort.
 4. Require an eyewash to be located in all areas where acids or bases are used. Safety showers should be nearby if significant acid or base quantities are involved.
 - a. Place emergency eyewashes and showers in accessible locations that require no more than 10 seconds to reach and are in a travel distance no greater than 25 feet (7.5 meters) from the hazard.
 - b. Mark emergency eyewashes and showers with a highly visible sign.
 - c. Require the area around emergency eyewashes and showers to be well lighted and visible.

URS SAFETY MANAGEMENT STANDARD

CORROSIVE AND REACTIVE MATERIALS

- d. Require emergency showers to deliver a minimum 20 gallons (85 liters) per minute for 15 minutes.
 - e. Require emergency eyewashes to be capable of delivering to the eyes not less than 1.5 liters per minute for 15 minutes.
- G. Be prepared to clean up spills of corrosive and reactive materials.
- 1. Have a written spill response plan in place before materials are stored on site.
 - 2. Have commercially-available spill kits available for clean up of small quantities of materials.
 - 3. Clean up or respond to spills promptly.
 - 4. Do not use combustible organic materials (sawdust, excelsior, wood chips and shavings, paper, rags or burlap bags) to absorb or clean up spills.
- H. Dispose of corrosive and reactive materials appropriately.
- 1. Segregate organic acids, inorganic acids, and basic wastes.
 - 2. Contract hazardous waste disposal services should be obtained to dispose of waste materials. All waste must be appropriately packaged for off-site transportation.
- I. Inspect corrosive and reactive storage and use areas periodically.
- 1. Inspect office settings quarterly.
 - 2. Inspect field related project sites at least once a week.
 - 3. Use the inspection sheet provided as [Attachment 9-1](#) to inspect sites.

5. Documentation Summary

- A. File these records in the Office Safety Filing System:
- 1. Completed Corrosive and Reactive Material Inspection Sheets.
 - 2. Worker Right to Know training documentation.

URS SAFETY MANAGEMENT STANDARD
CORROSIVE AND REACTIVE MATERIALS

- B. For field operations, file these records in the Project Safety File.
 - 1. Completed Corrosive and Reactive Material Inspection Sheets.
 - 2. Worker Right to Know training documentation.

6. Resources

- A. [ANSI](#) Z358.1-1990 American National Standard for Emergency Eyewash and Shower Equipment
- B. U.S. OSHA Technical Links - [Personal Protective Equipment](#)
- C. U.S. OSHA Technical Links - [Hazard Communication](#)
- D. Australian Standards AS 3780 - 1994. The Storage and Handling of Corrosive Substances
- E. Attachment 9-1 - [Inspection Sheet](#)

URS SAFETY MANAGEMENT STANDARD

Flammable and Combustible Liquids and Gases

1. Applicability

This procedure applies to URS office and field operations where flammable and combustible liquids and gases are stored or used.

2. Purpose and Scope

The purpose of this procedure is to provide information regarding the proper storage, handling and work practices associated with flammable and combustible liquids and gases.

3. Implementation

Office Locations- Implementation of this program is the responsibility of the Office Manager.

Field Activities- Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Appoint a Responsible Person who will:

1. Inspect storage areas periodically.
2. Monitor the quantity of flammable and combustible liquids and gases on the site.
3. Review work practices.

B. Control flammables, combustibles, and flammable gases entering the site.

1. Order only those materials and quantities that are needed to complete a job.
2. Check compliance with [SMS 2](#), "Worker Right to Know".

C. Storage

1. Store flammable and combustible materials in appropriate tanks and containers. See [Attachment 15-1](#).
2. Limit building storage outside of a flammable storage cabinet or storage room per [Attachment 15-1](#).

URS SAFETY MANAGEMENT STANDARD
Flammable and Combustible Liquids and Gases

3. Store oxidizers separately from flammables.
4. Segregate gas cylinders for storage based on their hazard (keep oxygen and acetylene cylinders stored separately).

D. Labeling and Signage

1. Post a "NO SMOKING OR OPEN FLAME" sign in all areas where flammable and combustible materials are stored, handled, and processed.
2. Require all containers and cylinders to be labeled with the contents and hazard-warning label.

E. Use of Materials on Site

1. Use flammable, combustible, and compressed gases in a manner that is consistent with the label and material safety data sheet for the product.
2. Use only those amounts of materials needed for the job. Transfer of flammables, combustibles, oxidizers to ready use containers is encouraged.
3. Use personal protective equipment stated on the product label and material safety data sheet.

F. Spill Control

1. Have a written spill response plan in place before materials are stored on site.
2. Clean up or respond to spills promptly.

G. Disposal

1. Keep solvent waste and flammable liquids in fire resistant, covered containers until they are removed from the worksite.
2. Do not place flammable or combustible waste in municipal garbage.
3. Dispose of flammable hazardous materials with a licensed hazardous material disposal company.

H. Inspection

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Flammable and Combustible Liquids and Gases

1. Periodically inspect flammable and combustible storage and use areas; gas storage areas and oxidizer storage areas:
 - a. Office settings inspect quarterly.
 - b. Field related projects, inspect once a month.
 2. Use the inspection sheet provided as [Attachment 15-2](#) to inspect the storage areas.
- I. Training

Require that Hazard Communication training includes specific hazard information for the flammables, combustibles and oxidizers used.

5. Documentation Summary

- A. File these records in the Office Safety Filing System:
 1. Location of the MSDS inventory.
 2. Completed Flammable and Combustibles Inspection Checklist.
- B. File these records in the Project Safety Filing System:
 1. Attach program to Project Safety Action Plan.
 2. File these records in the Project Safety File.
 - a. Location of the MSDS inventory
 - b. Completed Flammable and Combustible Inspection Checklist.

6. Resources

- A. [National Fire Protection Association](#) - Standard 58
- B. [Regulations of the U.S. Coast Guard](#)
- C. U.S. OSHA Standard - [Flammable and Combustible Liquids](#) - 29 CFR 1910.106
- D. U.K. - "Highly Flammable Liquids" and "Liquid Petroleum Gases" Regulations

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Flammable and Combustible Liquids and Gases

- E. Australian Standards AS 1940-1993. The Storage and Handling of Flammable and Combustible Liquids
- F. [Attachment 15-1](#) - Flammable and Combustible Liquid Classifications
- G. [Attachment 15-2](#) - Flammable, Combustible, Oxidizer & Compressed Gas Inspection Sheet

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

1. Applicability

This procedure applies to URS operations involving the use of hand tools and/or power equipment, including chain saws, brush cutters, powder-actuated tools, and similar high-hazard implements.

2. Purpose and Scope

The purpose of this standard is to provide guidelines for the safe use and handling of hand tools and power equipment.

3. Implementation

Office/Facility Locations - Implementation of this program is the responsibility of the Office Manager.

Field Locations - Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. General

1. Keep hand and power tools in good repair and used only for the task for which they were designed.
2. Remove damaged or defective tools from service.
3. Keep surfaces and handles clean and free of excess oil to prevent slipping.
4. Do not carry sharp tools in pockets.
5. Clean tools and return to the toolbox or storage area upon completion of a job.
6. Wrenches must have a good bite before pressure is applied.
 - a. Brace yourself by placing your body in the proper position so that in case the tool slips you will not fall.
 - b. Make sure hands and fingers have sufficient clearance in the event the tool slips.

URS SAFETY MANAGEMENT STANDARD
Hand Tools and Portable Equipment

- c. Always pull on a wrench, never push.
- 7. When working with tools overhead, place tools in a holding receptacle or secure when not in use.
- 8. Do not throw tools from place to place, from person to person, or drop from heights.
- 9. Use non-sparking tools in atmospheres with fire or explosive characteristics.
- 10. Inspect all tools prior to start-up or use to identify any defects.
- 11. Powered hand tools should not be capable of being locked in the on position.
- 12. Require that all power fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.
- 13. Do not allow loose clothing, long hair, loose jewelry, rings and chains to be worn while working with power tools.
- 14. Do not use cheater pipes.
- 15. Make provisions to prevent machines from automatically restarting upon restoration of power.

B. Grinding Tools

- 1. Inspect work rests and tongue guards for grinders.
 - a. Work rest gaps should not exceed 1/8 inch (3 mm).
 - b. Tongue guards gap should not exceed ¼ inch (6 mm).
- 2. Do not adjust work or tool rests while the grinding wheel is moving.
- 3. Inspect the grinding wheel for cracks, chips or defects. Remove from service if any defects are found.
- 4. Wear goggles when grinding. A clear full face shield may be worn with the goggles.

URS SAFETY MANAGEMENT STANDARD
Hand Tools and Portable Equipment

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 U.K. operations:
 - a. No grinding wheels exceeding 55mm are to be used.
 - b. All wheels are to be marked with their safe maximum speed.
 - c. Abrasive wheels will only be operated by personnel who have been specifically trained and specified competent by URS.
 - d. Abrasive wheels will only be operated by persons specified as competent, under the 'Abrasive Wheels' Regulations.
 - e. Abrasive wheels must only be operated if the manufacturer's guard is fitted and they are in good working order.

C. Power Saws

1. Require that circular saws are fitted with blade guards.
2. 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.

URS SAFETY MANAGEMENT STANDARD
Hand Tools and Portable Equipment

D. Wood Working Machinery

1. Do not use compressed air to remove dust, chips and from wood working machinery.
2. Locate the on-off switch to prevent accidental start up. The operator must be able to shut off the machine without leaving the work station.
3. Guard planers and joiners to prevent contact with the blades.
4. Use a push stick when:
 - a. The cutting operation requires the hands of the operator to come close to the blade.
 - b. Small pieces are being machined.
5. Adjust saw blades so they only clear the top of the cut.
6. Automatic feed devices should be used whenever feasible.

E. 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 clip or tie wire to secure connections between tool/hose/compressor if they are of the quick connection (Chicago fittings) type.
2. Do not lay hose in walkways, on ladder or in any manner that presents a tripping hazard.
3. Never use compressed air to blow dirt from hands, face or clothing.
4. Compressed air exhausted through a chip guarded nozzle shall be reduced to less than 30 psi. Proper respiratory, hand, eye and ear protection must be worn.
5. Never raise or lower a tool by the air hose.

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

F. Powder Actuated Fastener Tools

1. Use powder actuated tools that comply with the requirements of the American National Standards Institute (ANSI) standard A 10.3 - 1970.
2. Use only individuals that have been trained by a manufacturer's representative and possess the proper license to operate, repair, service and handle powder actuated tools.
3. Never use a powder actuated tool in a flammable or explosive atmosphere.
4. Require the use of goggles or a full face shield as well as safety glasses during operation of powder actuated tools.
5. Powder actuated tool must not be able to be fired unless the tool is pressed against the work surface.
6. The tool must not be able to fire if the tool is dropped when loaded.
7. Firing the tool should require two separate operations, with the firing movement being separate from the motion of bringing the tool to the firing position.
8. Never fire into soft substrate where there is potential for the fastener to penetrate and pass through, creating a flying projectile hazard.
9. Do not use powder actuated tools in reinforced concrete if there is the possibility of striking the re-bar.
10. Do not use on cast iron, glazed tile, surface hardened steel, glass block, live rock or face brick.
11. Never load and leave a powder actuated tool unattended. It should only be loaded prior to intended firing.
12. Test tools each day prior to loading by testing safety devices according to manufacturer's recommended procedure.

G. Chain Saws

URS SAFETY MANAGEMENT STANDARD
Hand Tools and Portable Equipment

1. Inspect the saw prior to each use and periodically during daily use.
2. Operate the chain saw with both hands at all times.
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.
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 may include, but is not limited to:
 - a. Loggers safety hat.
 - b. Safety glasses.
 - c. Steel-toed boots.
 - d. Protective leggings.
 - e. Hearing protection.
8. Inspect saws to require 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, improperly adjusted, or is not completely and securely assembled. Always keep the teeth sharp and the chain tight. Worn chains should immediately be replaced.

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

13. Keep all parts of your body away from the saw chain when engine is running.

14. For U.K. operations, only personnel specifically trained and certified as competent by URS can operate chain saws.

H. Hand Operated Pressure Equipment

1. Pressure equipment such as grease guns, paint and garden sprayers shall be directed away from the body and other personnel in the area. The person operating any equipment 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.

I. Gasoline Powered Tools

1. Never pour gasoline on hot surfaces.

2. Never fuel around open flame or while smoking.

3. Shut down the engine before fueling.

4. Provide adequate ventilation when using in enclosed spaces.

5. Use only OSHA approved safety cans to transport flammable liquids.

J. Inspection

Inspect all hand tools on a regular basis. Defective tools shall be immediately removed from service, tagged or destroyed to prevent further use.

5. Documentation Summary

Place in the Project Safety File:

URS SAFETY MANAGEMENT STANDARD

Hand Tools and Portable Equipment

- A. Site briefings regarding tool use.
- B. Records of tools removed from service.
- C. Copies of powder actuated tool licenses (as applicable).
- D. Tool inspection documentation.

6. Resources

- A. U.S. OSHA Standard - [Hand and Portable Power Tools](#) - 29 CFR 1910, Subpart P
- B. U.S. OSHA Standard - [Construction Tools - Hand and Power](#) - 29 CFR 1926, Subpart I
- C. [ANSI](#) A10.3 – 1970
- D. National Association of Demolition Contractors
(<http://www.demolitionassociation.com/>)
- E. U.K. - 'Abrasive Wheel' Regulations
- F. U.K. - 'Wood-Working Machine' Regulations
- G. U.K. - 'Provision and Use of Work Equipment' Regulations
- H. Australian Standards Collection 26 - Occupational Health & Safety - Powered Machining and Tools

URS SAFETY MANAGEMENT STANDARD

Hazardous Waste Operations

1. Applicability

This standard applies to URS field operations involving the investigation or remediation of sites impacted with hazardous wastes or hazardous materials including those associated with underground storage tanks.

Investigation projects for real estate transactions conducted to confirm that a site is "clean" are not covered under this standard. Reference related [Safety Management Standards](#) for such operations.

2. Purpose and Scope

The purpose of this standard is to provide guidance designed to minimize hazardous chemical exposures to URS personnel while URS is conducting hazardous waste field operations.

Investigation techniques included under this standard include, but are not limited to, hand auger, soil gas evaluation, test pits, and all types of power drilling, including direct push. Remediation techniques included under this standard include, but are not limited to, excavation, groundwater treatment, soil gas treatment, containment, and landfarming and similar insitu methods.

3. Implementation

Field Activities - Implementation of this procedure is the responsibility of the Project Manager or Superintendent.

4. Requirements

A. Project Evaluation

Assess the technical and field aspects of every hazardous waste site project to evaluate:

1. Risk of exposure to hazardous chemicals, with particular attention to suspected or known human carcinogens.
2. Personal protective equipment requirements.
3. Air monitoring requirements.
4. Emergency services requirements.
5. Hazards addressed by other URS [Safety Management Standards](#).

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Hazardous Waste Operations

6. Logistical considerations, such as access, distance from population centers.
7. Other safety and health hazards associated with site operations.

B. Client/Contract Evaluation

1. Review contract documents to determine whether the client has any special internal or regulatory requirements for hazardous waste site operations.
2. Implement client requirements in addition to those of this standard. Those requirements that are the most protective (e.g., most stringent) will be used.

C. Site-specific Health and Safety Plan

1. Prepare a site-specific Health and Safety Plan (HSP) for every project under this standard.
2. HSPs must be written or reviewed by a URS Health and Safety Regional Health and Safety Manager (RHSM) or a safety professional specifically approved by the RHSM.
3. Evaluate client and agency requirements prior to preparing the HSP, particularly if the client or an agency will approve the HSP prior to implementation.

D. Training

Verify that each assigned URS employee has completed required training. In general, the following are required for operations within North America:

1. 40-hours of initial training from an approved training provider.
2. 3-days of on-the-job training.
3. 8-hours of refresher training completed within 12 months of the initial or subsequent refresher training.
4. 8-hours of Site Safety Officer (Supervisor) training for directing the activities of any other URS employee.
5. Additional training for the Site Safety Officer as described below.

URS SAFETY MANAGEMENT STANDARD
Hazardous Waste Operations

E. Site Safety Officer

1. Appoint a Site Safety Officer (SSO) with appropriate qualifications for the specific hazardous waste project.
2. Assure that the SSO for complex projects, such as those with complicated remediation activities, has no duties other than site safety and health.
3. Verify that the SSO has completed basic supervisor training, and has additional required training and experience as applicable:
 - a. Advanced respiratory protection training is required for projects where supplied air respirators may be used.
 - b. Heavy equipment/construction safety.
 - c. Personal air monitoring.

F. Exposure Monitoring

Require that exposure monitoring is conducted in accordance with the HSP on all hazardous waste projects.

G. Project Equipment

1. Provide all health and safety equipment as described by the project Health and Safety Plan.
2. Provide all personal protective equipment as described by the project Health and Safety Plan.

H. Medical Surveillance

Verify that each URS employee assigned to the project meets the minimum requirements of the URS Medical Surveillance Program. This typically includes:

1. Baseline examination.
2. Annual examination.
3. Appropriate clearance for respirator use.

5. Documentation Summary

URS SAFETY MANAGEMENT STANDARD
Hazardous Waste Operations

In the Project Safety File:

- A. Completed Health and Safety Plan.
- B. Completed and signed HSP approval form.
- C. Signed HSP acceptance form.
- D. Completed H&S field forms that are included in each HSP.
- E. Training and Medical Surveillance Clearance documentation for project personnel.

6. Resources

- A. U.S. OSHA Technical Links - [Hazardous Waste Operations](#)

The following documents are PDF files which must be read with Adobe Reader:

- B. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - [NIOSH 85-115](#)
- C. USACE EM 385-1-1 - [Hazardous, Toxic and Radioactive Waste](#)

URS SAFETY MANAGEMENT STANDARD

Medical Screening & Surveillance

1. Applicability

This program applies to 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 assessments, the expected use of personal protective equipment, and client contract requirements.

2. Purpose and Scope

The overall goal of this program 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 in order to determine if employees are capable of safely performing assigned tasks, to verify protective equipment and controls are effectively providing protection, and to comply with governmental regulations. Included are provisions for emergency medical consultation and treatment.

3. Implementation

Office/laboratory locations – Implementation is the responsibility of the Office Manager.

Field activities – Implementation is the responsibility of the Project Manager.

Program Administration – The Occupational Health Specialist (OHS) is responsible for development and administration of this program in coordination with the URS Medical Service Provider (MSP). The OHS will maintain current injury and illness data and participate with Corporate Health & Safety Managers in evaluation of this program. The MSP will provide board certified occupational medicine oversight for the program and will approve medical surveillance protocols.

The United States and Canada locations will follow all requirements of this program.

International locations will follow sections B.1,2,3,5,6,7,8; G.3; and H.1 of this program.

4. Requirements

A. Selection of program participants.

URS SAFETY MANAGEMENT STANDARD
Medical Screening & Surveillance

1. The Medical Surveillance Evaluation (MSE) form 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 their supervisor at time of hire for any employee who may work outside an office environment and is to be reviewed for accuracy at each annual performance review. Other reviews are required whenever there is a change in job tasks.
2. Additional site/project specific biological monitoring or toxicological screening may be required in addition to this program's core exam schedule. These medical tests will be specified by the project-specific health and safety plan and will be authorized by the MSP on the exam appointment protocol. Note: See section D.2 if 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, projects involving exposure to OSHA-regulated materials 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; chemistry laboratory, pilot plant projects, or bench scale operations for 30 or more days per year.
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. In the event an employee declines the exit exam, the employee will be requested to sign a Waiver of Exit Medical Surveillance Exam.

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Medical Screening & Surveillance

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 when driving 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 management of construction, enrollment in this program will be required if more than 50% of their time is spent in an active construction area.
6. Individual radiation dose monitoring will be conducted as required by the site-specific health and safety plan with approval by a Radiation Safety Officer. Personal dosimetry (film badges) are typically required, however, depending on the specific radiation hazard, additional excretory monitoring or thyroid scans may be required.
7. In order 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 environments with airborne concentrations of asbestos fibers at or above the established action level will receive asbestos-specific baseline and annual exams. Exit exams will be performed if an exam has not been performed within the past 6 month period or if an employee has medical complaints related to asbestos exposure.

C. Exam protocols

1. The Medical Screening & Surveillance Exam Protocol identifies the medical exam components of this program.

D. Scheduling of exams

1. The Office or Project Manager, usually with assistance of the local H&S 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

URS SAFETY MANAGEMENT STANDARD
Medical Screening & Surveillance

exams and will contact the employee for scheduling the month their exam is due. These steps are detailed in the Medical Surveillance Exam Process.

2. Construction Services Division employees hired with an initial assignment to work at a OSHA 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 & Respirator Preassignment Baseline Exam Process. In the event of an urgent business necessity a temporary clearance to begin work the day of the exam, issued by the local physician and good for 14 days until the MSP physician final clearance is received, may be requested at the time a baseline exam is scheduled through the MSP.
3. 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) to the site Health & Safety Representative which will include any medical restrictions and address the employee's ability to use personal protective equipment. See Exam Follow Up Procedures.
2. The MSP will mail the exam invoice to the site H&SR who will approve the charge and forward the invoice to the accounts payable department for payment.
3. The MSP will mail an exam results letter that is confidentially addressed to the employee at their home address within 30 days of the exam date.

F. Emergency Medical Care

1. Preplanning is essential to a prompt and proper response to a medical emergency. Site specific emergency procedures will be provided in the site Health & Safety Plan. See Field First Aid Kit Supply List for recommended supplies. The contents of the first aid kit shall be checked prior to being sent out to each site/project and periodically thereafter to ensure the expended items are replaced.

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Medical Screening & Surveillance

2. A MSP occupational physician can be reached 24 hours a day for phone consultation at 1-800-455-6155.
3. A workers' compensation claim should be filed by the Human Resource Representative with St. Paul Fire and Marine Insurance (1-800-787-2851) for an injured employee who receives professional medical care or who is disabled from working beyond the initial date of injury.
4. In order to comply with OSHA reporting regulations, immediately notify the OHS or a Division Health & Safety Manager if there is a work-related hospitalization or death.

G. Medical Records

1. 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. 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 specific written consent must be signed by the employee.
3. International records (excluding the United States and Canada) will be maintained in country at the local clinic.

H. Program evaluation

1. The OHS and Division Health & Safety 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

URS SAFETY MANAGEMENT STANDARD

Medical Screening & Surveillance

procedures are reviewed and corrective actions are identified and acted upon as needed.

5. Documentation Summary

The H&SR will file the Medical Surveillance Evaluation and the Health Status Medical Report in the site health & safety records.

6. Resources

- A. U.S. OSHA Technical Links - Medical Screening/Surveillance
- B. U.S. OSHA Publication 3162 (1999) Screening and Surveillance: A Guide to OSHA Standards
- C. [Attachment 24-1](#) WorkCare Medical History Questionnaire
- D. [Attachment 24-2](#) Medical Surveillance Evaluation
- E. [Attachment 24-3](#) Medical Screening & Surveillance Exam Protocol
- F. [Attachment 24-4](#) Medical Surveillance Exam Process
- G. [Attachment 24-5](#) HAZWOPER/Respirator Preassignment Baseline Exam Process
- H. [Attachment 24-6](#) Exit Exam Determination
- I. [Attachment 24-7](#) Waiver of Exit Medical Surveillance Exam
- J. [Attachment 24-8](#) Exam Follow Up Procedures
- K. [Attachment 24-9](#) Field First Aid Kit Supply List
- L. [SMS 8](#) Asbestos Survey and Oversight Operations
- M. [SMS 17](#) Hazardous Waste Operations
- N. [SMS 42](#) Respiratory Protection

URS SAFETY MANAGEMENT STANDARD

Noise and Hearing Conservation

1. Applicability

This procedure applies to URS Corporation facilities and field operations where URS Corporation personnel may encounter noise exposures that may exceed 85 dBA as an 8 hour Time Weighted Average.

2. Purpose and Scope

The purpose of this procedure is to protect employees from hazardous noise exposures and to prevent hearing loss.

3. Implementation

Office/Lab locations: High noise is unlikely to be encountered at URS offices, however, if applicable, the implementation of this program is the responsibility of the Office Manager.

Field Activities: Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. General

The use of hearing protectors in any location where powered or motorized equipment or any other noise source could reasonably be expected to exceed 85 dBA. Use of hearing protectors may only be discontinued when noise levels are verified to be less than 85 dBA through a properly conducted noise survey. Whenever information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the project manager or location manager will be responsible to enforce the proper use of hearing protectors.

B. Hearing Protectors

1. Require that at least two (2) types of hearing protectors are available to employees free of charge, preferably a plug and a muff type.
2. Minimum Noise Reduction Ratings (NRR)

Hearing protectors issued must have the following minimum NRR:

Ear Plug	Muffs
29 dBA	27 dBA

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Noise and Hearing Conservation

3. Require that hearing protectors are used and thus effectively protect hearing.

C. 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 Safety Program 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).

D. Noise Controls

Eliminate noise sources to the extent possible. Examples of controls that must be considered follow:

1. Addition or replacement of mufflers on motorized equipment.
2. Addition of mufflers to air exhausts on pneumatic equipment.
3. Following equipment maintenance procedures to lubricate dry bearings.
4. Isolation of loud equipment with newer and quieter models.

E. Audiometric Exams

1. Tests

Details on the medical surveillance program (including audiometric testing) are included in [SMS 24](#).

Audiometric tests shall be performed by a person meeting OSHA's 1910.95 (g)(3)'s definition. Within 6 months of an employee's first exposure at or above the action level, a valid baseline audiogram shall be established against which subsequent audiograms can be compared. Testing to establish a baseline audiogram shall be preceded by 14 hours without exposure to noise. Hearing protectors may be used as a substitute for the requirement that

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Noise and Hearing Conservation

baseline audiogram shall be preceded by 14 hours without exposure to workplace noise. The medical surveillance provider shall 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 shall be obtained for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if there is a standard threshold shift (STS). If the annual audiogram shows that an employee has suffered a standard threshold shift, 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 shall review problem audiograms and shall 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.

2. Standard Threshold Shifts

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 the required Hearing Conservation Training. 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.

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Noise and Hearing Conservation

7. An explanation of the audiometric testing procedure.

5. Documentation Summary

- A. File these records in the Office Safety Filing System:
 1. Noise surveys, when applicable.
 2. Training Records.
- B. File noise surveys, when applicable, in the Project Safety File:

6. Resources

- A. [U.S. OSHA Standard – Occupational noise exposure – 29 CFR 1910.95](#)
- B. [U.S. OSHA Construction Standard – Occupational noise exposure – 29 CFR 1926.52](#)
- C. [U.S. OSHA Technical Links - Noise and Hearing Conservation](#)
- D. American Industrial Hygiene Association: The Occupational Environment – Its Evaluation and Control, Chapter 20. Fairfax, VA: 1997
- E. [National Hearing Conservation Association web site](#)
- F. [URS SMS 24 Medical Screening and Surveillance](#)

URS SAFETY MANAGEMENT STANDARD

Work Over Water

1. Applicability

This procedure applies to URS projects where personnel will work above or immediately adjacent to water where a drowning hazard exists. Refer to [SMS 053](#), "Marine Safety and Boat Operations."

2. Purpose and Scope

This procedure is intended to protect employees from drowning while working above or adjacent to water.

3. Implementation

Field Activities - Implementation of this procedure is the responsibility of the Project Manager.

4. Requirements

A. Review the project in the planning phase to determine if any work will occur above or immediately adjacent to water where a drowning hazard exists. In general, a risk of drowning (ROD) is present when:

1. Employees perform work on or under bridges without constant protection from falling into the water, or
2. Working surfaces at riverbanks slope so steeply that an employee could slip or fall into the water when no portable protection (like roping off) is used.

NOTE: Employees working on or under bridges who are constantly protected by guardrail systems, nets, or body belt/harness systems are deemed to be adequately protected from the danger of drowning and are not required to wear life jackets or buoyant work vests.

B. If any activities pose a risk of drowning do the following during the activity:

1. Provide employees with an approved (USCG for U.S. operations) life jacket or buoyant work vest. Employees should inspect life jackets or work vests daily before use for defects. Do not use defective jackets or vests.
2. Post ring buoys with at least 90 feet (27 meters) of line next to the work area. If the work area is large, post extra buoys 200 feet (60 meters) or less from each other.

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Work Over Water

3. Provide at least one life saving skiff, immediately available at locations where employees are working over or adjacent to water. Require that the skiff is in the water and capable of being launched by one person and is equipped with both motor and oars.
4. Designate at least one employee on site to respond to water emergencies and operate the skiff at times when there are employees above water.
 - a. If the designated skiff operator is not within visual range of the water, provide him or her with a radio or provide some form of communication to inform them of an emergency.
 - b. Designated employee should be able to reach a victim in the water within three to four minutes.
5. Require that at least one employee trained in CPR and first aid is on site during work activities.

5. Documentation Summary

Records required in the Project Safety File:

Copy of the fall protection plan designed for work activities – (as necessary)

6. Resources

- A. U.S. OSHA Standard - [Working Over or Near Water](#) - 29 CFR 1926.106
- B. U.K. - (Health, Safety & Welfare) Regulations

URS Safety Management Standard

Personal Protective Equipment

1. Applicability

This program applies to URS Corporation laboratory and field operations where the use of Personal Protective equipment (PPE) is warranted. Refer to [SMS 42](#), “Respiratory Protection”, for respiratory hazards. Hearing Protection issues are additionally addressed in [SMS 26](#), “Noise and Hearing Conservation.”

2. Purpose and Scope

This procedure provides information on recognizing those conditions that require personal protective equipment as well as selecting personal protective equipment for hazardous activities.

3. Implementation

Shop/Lab Locations - Implementation of this program is the responsibility of the Office Manager.

Field Activities - Implementation of this program is the responsibility of the Project Manager.

4. Requirements

- A. Perform hazard assessments for those work activities that are likely to require the use of PPE.
 - 1. Use [Attachment 29-1](#) to perform the assessment.
 - 2. Reevaluate completed hazard assessments when the job changes.
- B. Eliminate the hazards identified in [Attachment 29-1](#), if possible, through engineering or administrative controls.
- C. Select PPE that will protect employees if hazards cannot be eliminated.
 - 1. See [Attachment 29-1](#) for recommended PPE.
 - 2. Review Material Safety Data Sheets for chemicals used for PPE recommendations.
 - 3. If needed, consult with the URS Health and Safety Representative for assistance in selecting PPE.

URS Safety Management Standard
Personal Protective Equipment

- D. Provide required PPE to employees free of charge (excluding in some instances components of standard work attire such as steel-toed boots), assuring that it fits properly giving them a choice if more than one type is available.
- E. Whenever a hazard is recognized, and PPE is required, the employees will be provided with the appropriate PPE. However, when a PPE is not required, and the employee selects to wear his or her own PPE, the project manager shall ensure that the employee is properly trained in the fitting, donning, doffing, cleaning, and maintenance of his or her employee owned equipment.
- F. Conduct and document employee training.
 - 1. Train all employees who are required to wear PPE.
 - 2. Require that training includes:
 - a. When PPE is necessary to be worn.
 - b. What PPE is necessary.
 - 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. Training must be conducted before PPE is assigned.
 - 4. Refresher training is needed when:
 - a. New types of PPE are assigned to the worker.
 - b. 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.
- G. Maintain Protective Equipment
 - 1. Check personal protective equipment for damage, cracks, and wear prior to each use. Replace or repair equipment not found in good condition.

URS Safety Management Standard Personal Protective Equipment

2. Wash off contaminated protective equipment with water and mild soap, if necessary, to prevent degradation of the equipment.
- H. Periodically inspect worksites where employees are using personal protective equipment, using [Attachment 29-2](#).
1. Field activities – inspect work sites at least monthly.
 2. Office locations – inspect work sites semi-annually.

5.0 Documentation Summary

- A. Records required in the Project Safety File:
1. Completed Hazard Assessment Certification Forms ([Attachment 29-1](#))
 2. Completed Personal Protective Equipment Inspection Sheet ([Attachment 29-2](#))
 3. Documentation of employee training.
- B. Records required in the Laboratory Safety Filing System:
1. Completed Hazard Assessment Certification Forms ([Attachment 29-1](#))
 2. Completed Personal Protective Equipment Inspection Sheet ([Attachment 29-2](#))
 3. Documentation of employee training.

6.0 Resources

- A. U.S. OSHA Standards - Personal Protective Equipment -29CFR 1910 Subpart I
(<http://www.osha-slc.gov/SLTC/lead/index.html>)
- B. U.S. OSHA Construction Standard - Personal Protective Equipment –29 CFR 1926 Subpart E
(http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1926_SUBPART_E.html)
- C. U.S. OSHA Technical Links - Personal Protective Equipment
(<http://www.osha-slc.gov/SLTC/personalprotectiveequipment/index.html>)

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Personal Protective Equipment

- D. Australian Standards SAA HB9-1994 - Occupational Personal Protection
- E. American National Standards Institute, ANSI Z89.1-1986, Protective Headwear
(http://www.ansi.org/cat_top.html)
- F. American National Standards Institute, ANSI Z87.1 - 1989, Eye and Face Protection
(http://www.ansi.org/cat_top.html)
- G. American National Standards Institute, ANSI Z41.1 - 1991, Foot Protection
(http://www.ansi.org/cat_top.html)
- H. [SMS 40 - Fall Protection](#)
- I. [Attachment 29-1 Hazard Assessment Form](#)
- J. [Attachment 29-2 PPE Inspection Form](#)

URS SAFETY MANAGEMENT STANDARD

Remote Travel Health And Safety

1. Applicability

This program applies to URS personnel traveling to conduct project related work in remote locations and developing countries.

2. Purpose and Scope

The purpose of this program is to protect employees from communicable and non-communicable diseases that may be encountered in the work environment and provide travel safety information when traveling to developing countries.

3. Implementation

Office and Field Locations - Implementation of this program is the responsibility of the employee and the Project Manager.

4. Requirements

A. Travel Health

The goal of the travel health program is to maintain employee health status while traveling and working in developing countries and remote environments. Components include project planning, trip preparation, and personal safety.

1. Project Planning

- a. Prior to travel to developing countries or remote environments determine the necessary disease prevention strategies for all locations to be visited.
- b. Schedule required immunizations as soon as the project is awarded. Some immunizations require several injections spread over several weeks and sometimes months to obtain adequate protection.
- c. Review Attachments [36-1](#), [36-2](#), and [36-3](#) regarding illness prevention with staff as appropriate.
- d. Prepare personal and project first aid kits before traveling.

2. After Return

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Remote Travel Health And Safety

- a. Continue taking anti-malarial medication, if applicable, for 4 weeks after return.
- b. Consult a physician if any of these symptoms occur after return: fever, abdominal pain, diarrhea, weight loss, fatigue, cough, skin rash.

B. Travel Safety

1. Accidents are the leading cause of death for travelers, therefore constant attention to safe behavior is in order. Following the recommendations below will decrease chances of having an accident while traveling.
 - a. Preventing Traffic Accidents
 1. Hire a qualified driver or guide.
 2. Drive only when you are in good physical condition (not tired, hungover, drunk, etc.).
 3. Try not to drive at night.
 4. Rent a larger rather than smaller vehicle.
 5. Wear your seat belt.
 6. Be sure you are covered by collision and liability insurance.
2. Verify country security status with the State Department and with local contacts before travel.
3. Personal Safety
 - a. Avoid small nonscheduled airlines in developing countries.
 - b. Don't travel at night.
 - c. Carefully select swimming areas and don't swim alone. In many developing countries, serious diseases are contracted by swimming in streams so swim only in chlorinated swimming pools.
 - d. Lock your hotel room at all times.

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Remote Travel Health And Safety

- e. Review hotel fire safety rules and locate the nearest exits.
- f. Keep valuables and travel documents in the hotel safe.
- g. Avoid politically unstable regions where there is civil violence or drug related violence.
- h. Keep a photocopy of your passport in a separate location from your original and leave a copy at home.
- i. If you wear prescription glasses/contacts, take an extra pair.
- j. Use a money belt or a concealed money pouch for passports, cash and other valuables.
- k. Use official taxis rather than street taxis, as illegal taxis can be decoys for robbers.
- l. Whenever possible, do not travel alone.

5. Resources

- A. "Health Information for International Travel". U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, Atlanta, GA 30333
- B. Centers for Disease Control and Prevention Traveler's Health Hotline (404) 332-4559, Fax Information line (404) 332-4565
- C. United States Department of State Citizens Emergency Center (202) 647-5225
- D. [CDC Travel Information](#)
- E. [World Health Organization](#) –
- F. U.S. State Department – [Travel Warnings and Consular Information Sheets](#)
- G. Lonely Planet [Traveller's Guides](#)
- H. [Attachment 36-1](#) - Food Borne Disease Prevention
- I. [Attachment 36-2](#) - Water Borne Disease Prevention

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Remote Travel Health And Safety

- J. [Attachment 36-3](#) - Prevention of Insect Related Disease

URS SAFETY MANAGEMENT STANDARD

Respiratory Protection

1. Applicability

This program defines responsibilities and procedures and is applicable to URS operations 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 procedure is to protect those employees performing operations for which exposures can not 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.

3. Implementation

Laboratory/Office/Shop Locations - Implementation of this program is the responsibility of the Office Manager.

Field Activities - Implementation of this program is the responsibility of the Project Manager.

Program Administration- URS Health and Safety Director is responsible for the development and annual review of this program.

URS Health and Safety Program Representatives are responsible to:

- Assist responsible employees in the implementation of the program.
- Assessing local compliance with the program.

4. Requirements

A. Determine if respirators are needed or going to be used for hazardous jobs before assigning that job to an employee.

1. If the determination is that a potential for respiratory hazards exists with any portion of that job activity then, complete [Attachment 42-1](#).
2. Contact a URS Health and Safety Program Representative if any of the questions in [Attachment 42-1](#) are checked "yes."

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Respiratory Protection

3. Follow instructions in [Attachment 42-2](#) for employees who wish to voluntarily use dust masks.
 4. Follow all the requirements of this procedure for employees who wish to voluntarily use tight-fitting (e.g., air purifying) respirators.
 5. Required respirators will be paid for by URS and will be provided without cost to the employee.
- B. Select the proper respirator for the job.
1. For those jobs identified in [Attachment 42-1](#), contact a URS Health and Safety Program Representative for assistance in respirator selection.
 2. Contact a URS Health and Safety Program Representative for follow up if there are any problems implementing the recommendations made.
- C. Require employees who will use respirators to be medically qualified before fit testing and assigning them a respirator.
1. For program details, refer to [SMS 24, Medical Screening and Surveillance](#).
 2. Require that employees have a current and accurate Medical Surveillance form ([Attachment 24-2](#))
 3. Obtain a copy of the employee's Health Status Medical Report from the Health and Safety Representative. The consulting occupational 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.

URS SAFETY MANAGEMENT STANDARD
Respiratory Protection

- d. Whenever employees fail to demonstrate proper use or knowledge.
2. 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 use respirators effectively in emergency situations.
 - d. How to inspect, put on and remove, and check the seals of the respirator.
 - e. What the respirator maintenance and storage procedures are.
 - f. How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.
- E. Require respirator users to be fit tested.
- 1. Any employee who has been assigned a reusable respirator must be fit tested on an annual basis (no more than one 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. 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 social security 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. Statement that fit test protocol met the requirements of 29 CFR 1910.134.

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Respiratory Protection

g. Manufacturer and serial number of fit testing apparatus.

A fit test results form is available at [Attachment 42-5](#).

F. 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.

G. 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 change cartridges.
 - c. If any of the following is detected:
 1. Vapor or gas breakthrough.
 2. Leakage around the facepiece.
 3. Changes in breathing resistance.
4. Use cartridges with End of Service Life Indicators or determine the respirator cartridge changeout schedule. See [Attachment 42-4](#) for Guidance.

H. Require respirators to be cleaned and stored properly.

1. Clean and disinfect respirators after each use.

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Respiratory Protection

2. Store respirators in a plastic bag or case and in a clean location.
3. Inspect respirators before use and after each cleaning.
- I. Address issues associated with special use respirators self-contained breathing apparatus; air supply respirators; emergency use respirators).
 1. Self Contained Breathing Apparatus

Inspect self-contained breathing apparatus and other emergency use respirators 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 ppm.
 - b. Couplings on air hose lines must be incompatible with other gas systems.
- J. Require follow up training and medical surveillance to be provided as directed.
 1. Provide follow-up physical examinations as directed by the [SMS 24-3, Medical Screening and Surveillance Exam Protocol table](#).
 2. Provide follow-up physicals as directed by the Regional Medical Surveillance Administrator.

URS SAFETY MANAGEMENT STANDARD
Respiratory Protection

3. Provide annual refresher training.
4. Provide annual fit testing.

5. Documentation Summary

A. Laboratory

1. File these records in the Laboratory Safety Filing System
 - a. Completed forms:
 1. "Identifying When A Respirator Is Needed" - Attachment 42-1; and,
 2. "Respirator Standard Operating Procedure" - Attachment 42-3.;
 - b. Employee Health Status Medical Report includes clearance for respirator use.
 - c. Employee Fit Test Records; and,
 - d. Employee Respirator Training Records.
2. Send a copy of the following records to the Regional Health and Safety Manager:
 - a. Completed "Voluntary Use of Respirators" form - [Attachment 42-2](#).
 - b. Employee Fit Test Records.
 - c. Employee Respirator Training Records.

B. Field

1. File these records in the Project Health and Safety File:
 - a. Completed forms:
 1. "Identifying When A Respirator Is Needed" - [Attachment 42-1](#); and,

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Respiratory Protection

2. "Respirator Standard Operating Procedure" - [Attachment 42-3](#).
 3. Employee Health Status Medical Report includes clearance for respirator use.;
 4. Employee Fit Test Records; and,
 5. Employee Respirator Training Records.
2. Send a copy of the following records to the Regional Health and Safety Manager:
- a. Completed "Voluntary Use of Respirators" form - Attachment 42-2;.
 - b. Employee Fit Test Records; and,
 - c. Employee Respirator Training Records.

6. Resources

- A. U.S. OSHA Standard - [Respiratory Protection](#) - 29 CFR 1910.134
 - B. U.S OSHA Technical Links - [Respiratory Protection](#)
 - C. [ANSI](#) Z88.6, Respirator Use – Physical Qualifications for Personnel, Current Revision
 - D. [ANSI](#) Z88.2, Respiratory Protection, Current Revision
 - E. 3M Cartridge Service Life [Interactive Program](#)
 - F. Australian Standards AS/N25 1715 - 1994. Selection, Use, and Maintenance of Respiratory Protection Devices
 - G. Australian Standards HB9-1994. Occupational Personal Protection
 - H. [AIHA](#), The Occupational Environment - Its Evaluation and Control
- The following documents are PDF files which must be read with Adobe Reader:
- I. [NIOSH Respirator Decision Logic](#)

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- J. [NIOSH Guide to Industrial Respiratory Protection](#)
- K. Attachment 42-1 - [Identifying When a Respirator is Needed](#)
- L. Attachment 42-2 - [Voluntary Use of Respirators](#)
- M. Attachment 42-3 - [Respirator Standard Operating Procedure](#)
- N. Attachment 42-4 - [Respiratory Cartridge Change Schedule](#)
- O. Attachment 42-5 - [Fit Test Results Form](#)
- P. Medical Screening and Surveillance Program - [SMS 24](#)

URS SAFETY MANAGEMENT STANDARD

Back Injury Prevention

1. Applicability

This procedure applies to URS operations where personnel perform manual lifting.

2. Purpose and Scope

The purpose of this procedure is to prevent back injuries to URS personnel.

3. Implementation

Office Locations - Implementation of this procedure is the responsibility of the Office Manager.

Field Activities - Implementation of this procedure is the responsibility of the Project Manager.

4. Requirements

A. Safe Lifting Practices in the Office

1. Require that personnel receive the training described in (C) below.
2. Evaluate all assignments that involve lifting, such as moving boxes of files and paper, computer equipment, and the like to see that the task can be completed without risk of back injury to assigned personnel.
3. Provide material handling devices, such as carts and dollies, to assist in the safe moving of materials.
4. Obtain outside assistance, such as contract movers, if the job cannot be safely accomplished by URS personnel.
5. Require that heavier items are stored on lower shelving units.

B. Safe Lifting Practices in the Field

1. Recognize that field assignments tend to be lifting-intensive, and that URS has a duty to provide the means by which personnel can perform lifting duties without risk of injury.
2. Require that personnel receive the training described in (C) below.

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Back Injury Prevention

3. Evaluate all field assignments that involve lifting to see that the tasks can be completed without risk of back injury to assigned personnel.
4. Provide material handling devices, such as carts, dollies, trucks with lift gates, to assist in the safe moving of materials. If required, assign additional personnel to the task.
5. Direct field personnel not to assist in lifting tasks that are normally undertaken by subcontractor personnel.
6. Contact a URS Health and Safety Program Representative when assistance is necessary to evaluate a lifting task that may pose a back injury risk to assigned personnel.

C. Training

1. Require that personnel who may have lifting as part of their duties receive training that includes the following topics:
 - a. Showing personnel how to avoid unnecessary physical stress and strain.
 - 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 lifting.

D. Office Moves and Relocations

1. Utilize professional movers (who are appropriately insured) to move office furniture such as desks, file cabinets, and bookcases, even if such a move is only between offices or cubicles at a particular location (on-site move).
2. Utilize professional movers for intensive moving of file boxes and other heavy materials.

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Back Injury Prevention

E. Material Packaging

1. Use only smaller size (<18") file ("Banker") boxes for file storage, as the larger (>18") boxes are awkward and readily overloaded.
2. Use only smaller coolers for field samples, as the larger coolers are awkward and readily overloaded.

5. Documentation Summary

File the following documents in the Office Health and Safety File

- Training rosters

File the following documents in the Project Health and Safety File

- Training rosters

6. Resources

- A. Work Practices Guide for Manual Lifting, NIOSH

URS SAFETY MANAGEMENT STANDARD

Subcontractor Health and Safety Requirements

1. Applicability

This procedure is applicable to subcontractors retained by URS to perform construction (including drilling and excavation), alteration, demolition, and/or repair activities utilizing their own workforce or equipment. 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 Corporation. Health and safety 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 guidelines on the pre-evaluation of subcontractor safety programs. It also provides guidance on contractual risk management, subcontractor safety performance on the job site, and the responsibilities of the Project Manager with respect to subcontractor jobsite safety performance.

It is recommended that each URS Corporation subcontractor be evaluated at least annually using Attachment 46-1, "Subcontractor Safety Evaluation Form," in order to perform work on any new URS Corporation projects.

3. Implementation

Field Activities - Implementation of this procedure is the responsibility of the Project Manager.

4. Guidelines

A. Pre qualification of Subcontractor - The Project Manager shall 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 Health and Safety Evaluation Form" (Attachment 46-1).
2. Conduct an assessment of each subcontractor's qualifications with respect to the subcontractor health and safety evaluation criteria contained in [Attachment 46-2](#).

URS SAFETY MANAGEMENT STANDARD
Subcontractor Health and Safety Requirements

3. Verify that subcontractors meet the insurance requirements as stated in [Attachment 46-2](#) or as approved by Counsel.
4. If the subcontractor has been successfully evaluated within the last 12 months, that evaluation may be substituted.
5. For long term projects, this evaluation should be updated within 12 months of the previous evaluation.

B. Contractual and Risk Management Requirements of Subcontractors

1. Ensure that subcontractor is contractually bound to comply with applicable client and URS Corporation Health and Safety 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.
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 Corporation has the right in its subcontract, without liability to the subcontractor, to stop the subcontractor's work in the event of any violations of the applicable Health & 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.

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- 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 Corporation Site Safety 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.
2. Provide SSR with name of URS Corporation project 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 Corporation site representatives.

E. Subcontractor Safety Performance

1. To the extent reasonable in light of URS Corporation's scope of work under the client contract, visit the site and periodically observe subcontractors operations (i.e., conduct spot checks) to assess whether subcontractor appears to be conducting its 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 deficiencies are observed immediately bring them to the attention of the SSR for resolution.

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3. In the event of observation of an “Imminent Danger” situation (i.e. involving a situation that could result serious injury or death), immediately contact the SSR and stop the work.
4. Investigate all injuries/illnesses related to subcontractor operations to identify causes and effect corrective actions.
5. 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. Documentation Summary

A. File in the Project Safety File

1. Subcontractor Health and Safety Evaluation Form.
2. Applicable and current Insurance Certificates.
3. Names and telephone numbers of SSR for each subcontractor.
4. Verification of Health and Safety documents transmitted to subcontractors and received from subcontractors.
5. Identified safety deficiencies as applicable for subcontractors and verification of correction of conditions.
6. All other safety related documentation between URS Corporation and subcontractor such as training certifications, etc.
7. Subcontractor safety plan, incident reports and resolution reports.

6. Resources

- A. Federal OSHA Workplace Injury and Illness statistics (<http://www.osha.gov/oshstats/work.html>)
- 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,

URS SAFETY MANAGEMENT STANDARD
Subcontractor Health and Safety Requirements

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>)
- 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. "Design Professional Liability Under OSHA," Presented by Thomas F. Holt, Jr., HWAC Lawyer's Roundtable, June 14, 1995 (to be Published)
(<http://www.hwac.org>)
- G. "Occupational Injury and Illness Rates by SIC", Bureau of Labor Statistics, U. S. Department of Labor (<http://stats.bls.gov/sahome.html>)
- H. [Attachment 46-1](#) - Subcontractor Safety Evaluation Form
- I. [Attachment 46-2](#) - Subcontractor Evaluation Criteria

URS SAFETY MANAGEMENT STANDARD
Biological Hazards

1. Applicability

This program applies to job activities performed primarily in outdoor environments.

2. Purpose and Scope

The primary goal of this program is to eliminate or reduce illnesses and injuries transmitted by plants, insects, and animals. Although there are many animals and insects that are potentially harmful to humans (i.e. bees, spiders, bears, and rodents), this safety management standard focuses on four common biological hazards: ticks, poison plants, mosquitoes, and snakes.

3. Implementation

The Project Manager, with support from the URS H&S Regional Managers and Occupational Health Specialist, will be responsible for implementation of this program.

4. Requirements

A. Ticks

1. Precautionary Measures

Background information: Ticks do not jump, crawl, or fall onto a person. They are picked up when clothing or hair brushes a leaf or other object the tick is on. Ticks are generally found within three feet of the ground. Once picked up, they will crawl until they find a likely site to feed. Often they will find a spot at the back of the knee, near the hairline, behind the ears, or at pressure points where clothing presses against the skin (underwear elastic, belts, neckline). The best way to prevent tick borne diseases is not to be bitten by a tick. Ticks can carry a number of diseases including:

- Lyme Disease is an infection caused by the corkscrew-shaped bacteria *Borrelia burgdorferi* that is transmitted by the bite of deer tick (ixodes) and western black-legged ticks. The disease occurs in the forested areas of North America, Europe, and Asia. Symptoms which occur 3-30 days following a tick bite include: a spreading 'bull's-eye' rash, fever, fatigue, headache, and joint and muscle aches. Prompt treatment with antibiotics is essential in order to prevent more serious complications that may occur if left untreated.

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- 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 2-6 days following a tick bite include: fever, nausea, vomiting, diarrhea, rash, muscle and joint pain. The disease is treated with antibiotics.
- 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.
- Ehrlichiosis is caused by several bacteria of the genus *Ehrlichiae*. The geographic distribution is global, primarily in temperate regions. Symptoms which occur 5-10 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.

a. 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 that 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.

b. Personal Protective Equipment

1. Wear light colored clothing or white Tyvek® to allow you to see ticks that are crawling on your clothing.
2. 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.
3. Wear a hat, tie back long hair.
4. 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-

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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.

c. Tick Check

1. Change clothes when you return from an area where ticks may be located.
2. Shower to wash off any loose ticks.
3. Check your entire body for ticks. Use a hand held or full-length mirror to view all parts of your body.
4. Place clothing worn in tick infested areas into the dryer for at least 30 minutes in order to kill any ticks.

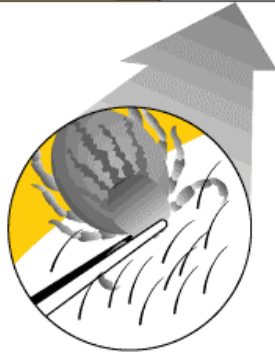
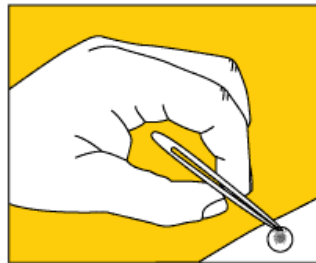
2. Tick Removal

Because 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.



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- 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.

3. 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

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should seek medical attention if any signs and symptoms of tick borne disease develop over the weeks following the tick bite.

B. Poisonous Plants

1. 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:

- 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 4 to 48 hours. Approximately 50-70 % 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.
- 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.
- 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.

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Poison Ivy grows as a small plant, vine, and as a shrub. Leaves always consist of three glossy leaflets.



Poison Ivy

Poison Oak grows as a shrub or vine. It has three leaflets that resemble oak leaves.



Eastern Poison Oak

Poison Sumac grows as a woody shrub or small tree from 5 to 25 feet tall. It has 7 to 13 leaves that grow opposite each other with a leaflet at the tip.



Poison Sumac

1. Precautionary Measures

- The best approach is to learn to identify the plants and avoid them.
- Wear long pants and long sleeves, boots and gloves.
- Barrier skin creams may offer some protection if applied before contact.

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- Avoid indirect contact from 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.
- If you can wash exposed skin areas within 3-5 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.

2. Medical Follow-Up

Home treatment: Calamine lotion and an oatmeal (one 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* (*P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*). 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 8 days to 1 year after infection

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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 3-6 days after the mosquito bite and include fever, nausea, vomiting, headache, slow pulse, muscle aches, and restlessness. Treatment is symptomatic.

2. Precautionary Measures

- Insect Repellent – Use insect repellants that contain DEET. The effect should last about 4 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.
- Protective Clothing – wear long sleeved shirts and long pants, especially from dusk to dawn. Or avoid going outdoors during these hours.
- 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 have been sprayed with permethrin.
- Malaria prophylaxis medications may be prescribed, however they do not provide complete protection. The type of medication given depends on the area of travel.

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D. Poisonous Snakes

1. 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 of Africa and Asia: viper, cobra, adder, green mamba.
- f. Poisonous snakes in Australia: copperhead, adder, taipan, tiger snake.

2. 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:

- Don't put your hands into dark places, such as rock crevices, heavy brush, or hollow logs, without first investigating.
- 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.
- Don't walk through heavy brush or tall grass without looking down. Look where you are walking.

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- 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.
- 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.

3. 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 antivenom if warranted. Initial first aid should include: Wash the bite with soap and water. Immobilize the bitten area and keep it lower than the heart. Try to remain calm. If you are unable to reach a hospital within 30 minutes, a bandage, wrapped two to four 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 band is loose enough that a finger can slip under it. A suction device from a commercial snakebite kit may be placed over the bite to help draw venom out of the wound.

Research has shown the following to be potentially harmful, DO NOT: apply ice, use a tourniquet, or make incisions into the wound.

5. Documentation Summary

Complete and distribute a URS Incident Report form 49-1 for all work-related biological exposure incidents.

6. Resources

Centers for Disease Control
<http://www.cdc.gov>

U. S. Occupational Safety and Health Administration
<http://www.osha.gov>

U.S. Food and Drug Administration
Treating and Preventing Venomous Snake Bites

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DOT Shipping

1. Applicability

Office and field operations that ship hazardous materials (HazMat) must follow this Hazardous Material Shipping Program.

Hazardous materials may include, but are not limited to, compressed gases, laboratory reagents, field samples, hazardous wastes, and materials used for bench scale and pilot plant operations.

2. Purpose and Scope

This program was designed to provide a framework for compliance with the requirements of the U.S. Department of Transportation (DOT) 49 CFR and the International Air Transportation Association (IATA) for shipping hazardous materials by land or air.

3. Implementation

Office Locations - The Office Manager is responsible for implementing this program at company locations/facilities.

Field Activities - The Project Manager is responsible for compliance and implementation of this program at project sites.

4. Requirements

A. Staffing

Each project or location must ensure that awareness and function specific trained individuals are involved in the process of preparing hazardous materials for shipment.

Each location where HazMat shipping occurs or where HazMat employees are assigned must identify a local or regional Shipping Specialist.

B. General Procedures

1. Select the best way to ship the HazMat item based on the quantity, hazard(s), and mode of transportation (e.g., air, land, water).
2. Ensure package contents are compatible.
3. Package, mark, and label according to applicable regulations.

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DOT Shipping

4. Complete the bill of lading or shipper's declaration for dangerous goods according to applicable regulations.
5. Follow hazard communication requirements:
 - a. Send a copy of the appropriate Emergency Response Guidebook page or material safety data sheet (MSDS) with each shipment.
 - b. Include the 24-hour emergency response phone number (CHEMTREC 800-424-9300 domestic, 703-527-3887 international) on the shipping paperwork.

C. Placarding Requirements

1. Placards must be offered to drivers if the amount of hazardous materials being shipped exceeds 1,000 pounds.
2. For extremely hazardous materials (e.g., severe explosives and toxics), any amount requires placarding.
3. "Limited quantities" are excepted from placarding.
4. URS employees transporting hazardous materials meeting DOT tracking and shipping requirements will obtain the proper Commercial Drivers License and endorsement.

D. Training

1. Require employees who package, prepare paperwork, load and/or unload, and transport hazardous materials be trained to the appropriate level of activity:
 - a. Training is required prior to performing HazMat shipping activities.
 - b. Training is required when regulatory changes impact current procedures and every 2 years.
 - c. General awareness training is required for everyone who is involved in HazMat shipping. This training includes:
 1. Recognizing hazardous materials
 2. Penalties for not complying

URS SAFETY MANAGEMENT STANDARD

DOT Shipping

3. Basic regulatory requirements

- d. Function specific training is required to ensure employees can perform the specific HazMat jobs safely and in compliance with applicable regulations.
- e. Driver's may be exempt from function specific training if the DOT's Materials of Trade (MOT) exception applies to the shipment. (See [Attachment 48-1](#) for information on this exception).

E. Special Requirements

- 1. Some countries and transporters have more stringent requirements than DOT or IATA. For example, the United Parcel Service (UPS) publishes its own Guide for Shipping Ground and Air Hazardous Materials. URS shipping training and this program may not meet these additional requirements.
- 2. Contact the applicable shipping company or a URS Health and Safety Program Representative if you are unsure or suspect there may be additional, special requirements on a shipment.
- 3. For international shipments an expeditor may be required to ensure needed materials are not held in customs. It may be advisable to purchase hazardous materials once you arrive in your destination country.

5. Documentation

All files must be kept in a central location.

A. Training records

- 1. Sign-up sheet with list of employee names, date, management certification.
- 2. Successfully completed tests.
- 3. Outline of course materials.

6. Resources

URS SAFETY MANAGEMENT STANDARD
DOT Shipping

- A. 49 Code of Federal Regulations, Parts 171-180, Subchapter C-- Hazardous Materials Regulations.
- B. Dangerous Goods Regulations. [International Air Transport Association](#). 40th Edition. Effective January 1, 1999.
- C. International Maritime Dangerous Goods Code. International Maritime Organization, Amendment 29-98.
- D. [DOT Office of Hazardous Materials Safety](#)
- E. URS HazMat Shipping Support Helpline 800.381.0664
- F. [Attachment 48-1](#) - Materials of Trade Summary
- G. [DOT Hazmat Certificate of Registration](#)

URS SAFETY MANAGEMENT STANDARD

Injury / Illness / Incident Reporting

1. Applicability

This procedure applies to URS Corporation offices and field operations.

2. Purpose and Scope

The purpose of this procedure is to provide guidance for the timely reporting of work related injuries, illness, and incidents.

3. Implementation

Office Locations - Implementation of this program is the responsibility of the employee's Supervisor.

Field Activities - Implementation of this program is the responsibility of the Project Manager.

4. Requirements

A. Reporting: All employees shall immediately notify their appropriate level of management (line, project, and/or office) of a reportable incident. A reportable incident includes the following:

1. An injury to any URS employee, subcontractor, client representative, or private citizen, even if the injury does not require medical attention;
2. An injury to a member of the public occurring on a URS work site or possibly resulting from a URS or subcontractor activity or involving URS or subcontractor property, equipment, or resource;
3. Illness resulting from suspected chemical exposure;
4. Chronic or re-occurring conditions such as back pain or cumulative trauma disorders (example: carpal tunnel syndrome);
5. Fire, explosion, or flash;
6. Any vehicle accidents occurring on site, while traveling to or from client locations, or with any company-owned or leased vehicle;
7. Property damage resulting from any URS or subcontractor activity;
8. Structural collapse or potential structural hazards;

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Injury / Illness / Incident Reporting

9. Unexpected release or imminent release of a hazardous material;
 10. Unexpected chemical exposures to workers or the public;
 11. A safety related complaint from the public regarding URS activities.
 12. Any other significant occurrence that could impact safety.
- B. Actions: The following actions will be taken following a reportable incident:
1. Employees:
 - a. If necessary, suspend operations and secure and/or evacuate the area;
 - b. Immediately notify your supervisor and/or project manager
 - c. Record information pertaining to the incident (e.g., time, date, location, name and company of person(s) involved, description of event, and actions taken);
 - d. Assist with incident investigation as directed by management;
 - e. Implement corrective actions as directed by management;
 - f. *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;
 - g. *Do not* make statements pertaining to guilt, fault, or liability.
 2. Line/Project Management:
 - a. Review circumstances of the incident with applicable employee(s);
 - b. Notify local Health and Safety representative. If incident involves and an injury/illness of a URS employee, also notify the local Human Resources Representative;
 - c. Complete and distribute injury/incident report within 24 hours. (Note: If the employee is unable to complete the

URS SAFETY MANAGEMENT STANDARD
Injury / Illness / Incident Reporting

report, another company employee, line manager, project manager, or local health and safety representative may complete the report.);

- d. Review and verify that necessary corrective actions are identified and implemented;
- e. Discuss with department or project staff the circumstances surrounding the incident and corrective actions taken.

3. Local Health And Safety 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 for completeness and accuracy;

4. Local Human Resources Representative

- a. Report work-related injuries and illness to worker compensation carrier

AIG Claim Services @ 1-877-366-8423

5. Corporate Health and Safety Management

The Occupational Health Specialist (OHS), Corporate Health and Safety Director, and Construction Services Division Safety and Health Director will review all reported incidents (U.S.-based employees only) to determine OSHA reporting and recording requirements. All decisions will be based strictly on current Federal OSHA guidelines.

- a. Official records (including required reports, logs, for all reported incidents will be maintained at one central location by the OHS.
- b. The OHS will send each establishment any required government report for their establishment following receipt of an incident report.

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Injury / Illness / Incident Reporting

- c. Each January the OHS will prepare and distribute, to each URS establishment, the appropriate government injury/illness reports. These reports will summarize all required government information for incidents that occurred during the preceding calendar year. Each establishment will post these reports in a prominent location for the time specified by current regulations.

5. Documentation Summary

A. File these records in the Office Safety File:

1. [Attachment 49-1](#) - Incident Report Form
2. Maintain OSHA 200 Log.

B. File these records in the Project Health and Safety File

1. [Attachment 49-1](#) - Incident Report Form
2. Maintain OSHA 200 Log if applicable for Project.

6. Resources

A. U. S. OSHA

<http://www.osha.gov/>

URS SAFETY MANAGEMENT STANDARD

Marine Safety and Boat Operations

1. Applicability

This program establishes guidelines for the safe conduct of personnel working in the marine environment and personnel operating watercraft during URS field activities such as biological sampling, sediment sampling, and bathymetry.

2. Purpose and Scope

Maritime work has the same risks associated with land-side activities with the additional risks of drowning, hypothermia, and the energy of wave action. It is an inherently dangerous environment that must be treated with respect. This SMS delineates personal protective equipment requirements to address these hazards. In addition, this specifies watercraft-operating restrictions for URS activities.

The operation of watercraft by company employees will be an infrequent event, but may be a necessary part of a project due to the remote location of the job site. Where possible, subcontractors who specialize in the operation of watercraft will be contracted to provide work platforms. In most countries, a contractor hired to carry passengers aboard a small craft is required to be licensed by the national maritime authority or coast guard. Similarly, any vessel carrying more than 12 passengers (6 passengers in the US) must carry a certificate certifying safe carriage of passengers.

When it is not possible to hire an appropriate contractor to provide a safe work platform or vessel, then URS personnel may operate work boats in accordance with the guidance of this standard.

3. Implementation

Field Locations - Implementation of this program is the responsibility of the employee and the Project Manager.

4. Definitions

There are five types of Personal Flotation Device (PFD):

A. Type I is an offshore lifejacket

- Type I PFD will right an unconscious wearer and will usually keep the wearer's face out of the water.
- Type I PFD's are bulky and uncomfortable to wear for long periods of time.

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B. Type II is a near shore buoyancy vest

- Type II PFD will right an unconscious wearer and will usually keep the wearer's face out of the water.
- Type II PFD's are bulky and uncomfortable to wear for long periods of time.

C. Type III is a floatation aid

- Generally the most comfortable PFD is the Type III which has at least 15.5 pounds of buoyancy in the adult size.
- The Type III PFD provides adequate buoyancy, but will not turn the wearer face-up in the water.
- The Type III device is more comfortable to wear, and is designed to be worn as work attire.
- Common Type III devices are work vests and harnesses with built in pneumatic floatation.

D. Type IV is a throwable device

- Type IV PFDs include the horseshoe collar, ring buoy, and seat cushion.
- They have at least 16.5 pounds of buoyancy and must offer immediate access.

E. Type V is a hybrid inflatable or special use device

- A Type V PFD is special purpose floatation.
- The full body insulating floatation suits that are suitable for work in cold weather are Type V devices.
- PFDs designed to survive high-speed impacts (like water skiing vests and jet-ski vests) are Type V devices.
- Some Type V PFDs are CO2 activated, and are very low profile until inflated.

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5. General Marine Safety

In general, the two additional hazards that maritime work involves are drowning and hypothermia. All other hazards are generally similar to our landside activities, and the personal protective equipment requirements are identical (hardhat, safety glasses, hearing protection, steel-toe shoes, etc).

Wearing a personal floatation device mitigates the risk of drowning. Company employees are required to wear a type III PFD anytime they are aboard a small craft and are outside of an enclosed cabin. The PFD must be readily accessible for each person inside a cabin. If employees are working aboard a larger vessel (>26 feet in length), a PFD must be readily accessible, but need not be worn unless engaged in activities on an open deck or at the rail.

The risk of hypothermia is mitigated by wearing appropriate insulated floating outerwear when cold weather or cold water is a threat. A Type V PFD, usually referred to as a "mustang suit", is a full body PFD that has excellent insulation qualities and will extend the wearer's survivability in the event of immersion or dowsing with spray when in cold weather. The wearing of these PFDs is required when the air temperature and the water temperature combined are less than 100 degrees F (38 degrees C), and when the small craft is less than 26 feet in length. When the working platform is larger than 26 feet, the wearing of a mustang suit is at the discretion of the boat Captain, the site supervisor, or the URS employee.

6. Operation Of Boats

A. Limitations

1. URS personnel may perform work from a small boat under following conditions:
 - a. The boat used for the work must be appropriate to the type of work and suitable for safe carriage of the workers necessary for the task.
 - b. The work site must be located in a protected area like a bay, sound, lake, or body of water that is protected from open-sea weather conditions.
 - c. The work site must be within sight of land, and in no case more than 5-miles from shore.
 - d. All operations will be completed in daylight hours under reasonable weather conditions with good visibility.

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- e. The operator of the boat must have sufficient experience and knowledge to be competent in the operation of the boat at the work site location.
 - f. There must be at least two people in the boat anytime the boat is underway.
 - g. The boat and personnel must be properly equipped as specified below.
 - h. The boat operator must be intimately familiar with all aspects of the boat, its intended use, the local area, and expected weather conditions.
 - i. The boat must be monitored from the shore, either directly with a supervisor, or by filing a “float plan” with the project manager or other responsible person before getting underway.
2. Prior to departing the dock, the boat should be checked for:
- a. Watertight integrity
 - b. Operation of machinery (ahead and astern, throttle, ignition cut-off)
 - c. Appropriate safety gear (see section 6.B below)
 - d. Proper loading of the boat (personnel and equipment) such that vessel stability is not jeopardized.
 - e. Sufficient fuel for the duration of the trip and site work.
 - f. All electrical and electronic equipment in good working order (lights, radios, horns, etc)
3. While operating, the boat operator shall:
- a. Maintain a communication schedule with shore support as specified in the float plan.
 - b. Periodically monitor the weather on the VHF radio.
4. When moored, the boat operator shall close-out the float plan (if one

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was required).

B. Boat Safety Equipment (for URS Operated Small Boats)

1. All persons on the boat will wear an U. S. Coast Guard approved Type III PFD device.
2. In addition, at least one throwable Type IV devices will be readily available for use.
3. At least one B-II U. S. Coast Guard approved hand-held portable fire extinguisher will be on the boat, readily available for use.
4. Visual Distress Signal Flares (check expiration date) and a battery operated light will be in good working order and readily available on the boat.
5. A sound-producing distress signal, either bell, whistle, or horn, will be in good working order and readily available on the boat.
6. A first aid kit will be available on the boat.
7. All boat fuel (gasoline or diesel) will be contained in fuel tanks or approved containers that supply fuel to the engine via approved fuel lines. No fuel transfers between containers are to be conducted aboard the boat.
8. A secondary means of propulsion will be available on the boat (multiple engines, oars or paddles for smaller vessels).
9. A boat hook, anchors, and proper mooring lines will be available on the boat.
10. A VHF radio is required for any boat working more than one mile offshore, or at any site where there is no shore-side support for the boat crew. (The radio may have to be licensed by the FCC depending upon transmission strength and installation.) When operating less than one mile from shore, a citizens band radio, cellular telephone, or a UHF radio may be used to provide positive communication with shoreside support.

C. Safe Boating Operations

1. All boats will be properly registered for use in waterways of local,

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state, and federal jurisdictions.

2. All boat trailers and towing vehicles will be properly licensed and in good working order.
3. The boat must be operated by experienced personnel. The U. S. Coast Guard Auxiliary and other volunteer organizations regularly sponsor boating safety courses. In addition to basic boating safety, the courses cover navigation regulations and emergency procedures. The training is recommended, even for experienced boat operators.
4. The boat will be operated in a safe manner and all waterway regulations will be obeyed.
5. No alcoholic beverages, firearms, or illegal drugs are permitted on the boat.
6. No recreational equipment for fishing, hunting, water skiing, or SCUBA diving will be allowed on the boat unless specifically authorized as part of the work-related equipment.

D. Boating Accidents

Coast Guard and State regulations require accident reports if significant injuries or property damage occurs. The definition of a reportable accident varies between State and National authorities. The boat operator must be familiar with accident reporting requirements, usually available through the State's Department of Motor Vehicles. Any incident or accident should also be reported in accordance with [SMS 49](#).

E. Float Plan

A float plan is required to be completed anytime the watercraft will be operating beyond the confines of a shore supported work site. The float plan ([Attachment 53-1](#)) should be completed and given to a shore supervisor who will know what actions to take in the event the boat is overdue.

7. Off-Shore Platforms

- A. URS personnel may be required to visit offshore platforms. The client safety procedures will be the requirements in force.

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- B. Staff required to visit of-shore platforms will be trained/oriented regarding emergency procedures (evacuations, fire, first aid, assembly point), safe work practices, transfer from helicopter/boat to the platform and proper PPE (head protection, eye protection, floatation devices, foot protection, work clothes).
- C. Training records shall be maintained by the Office Health and Safety Representative.
- D. Transportation to platforms typically involves helicopter transfer. The helicopter pilot is in complete command and will make all decisions regarding weather, loading, seating, luggage/equipment allowed aboard, any transport of hazardous materials (e.g., sample coolers) and in-flight communications. Staff will receive a briefing regarding emergency procedures, safe helicopter entry, and rules of conduct.
- E. Work platforms combine a work area with worker accommodation/food service facilities. Alcoholic beverages, illegal drugs, and firearms are prohibited at all times on the platforms, including off-duty periods.

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Office Ergonomics

1. Applicability

This program applies to job activities performed at computer workstations and covers factors designed to maximize compatibility between employees and office work.

2. Purpose and Scope

The primary goal of this program is to eliminate or reduce work-related cumulative trauma disorders, CTDs (also called musculo-skeletal disorders, repetitive strain injuries, repetitive motion injuries and occupational overuse syndrome). CTDs are not caused by a single event such as a slip, trip, or fall. CTDs are injuries to tendons, muscles, and nerves that occur as the result of repeated, prolonged, forceful or awkward body movements. CTDs can be prevented with proper interventions. Examples of CTDs are tendinitis, carpal tunnel syndrome, rotator cuff syndrome, epicondylitis, and De Quervain's disease.

Essential elements of this program include: management support, prompt employee reporting, workstation ergonomic analysis and control, employee training, health care management, and program evaluation.

3. Implementation

The Office Manager, with support from the URS H&S Divisional Managers and Occupational Health Specialist (OHS), will be responsible for implementation of this program.

4. Requirements

A. Management Leadership

URS management supports this program by encouraging employees to report signs and symptoms of CTDs whenever they occur and by authorizing the necessary resources to conduct training and ergonomic control measures at no cost to the employee.

B. Reporting Problems

Early recognition and reporting of signs and symptoms of CTDs are essential in preventing impairment and disability. Employees should notify their supervisor and submit a completed URS Incident Report ([SMS 49-1](#)) when experiencing the following warning signs: neck, upper back,

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shoulder, elbow, forearm, wrist, hand, thumb or fingers: intermittent and migratory pain, fatigue or weakness, tingling or burning, numbness, and lack of coordination or stiffness and cramping.

C. Workstation Ergonomic Analysis

The Regional H&S Manager or Local Health and Safety Representative will perform an ergonomic assessment ([Attachment 54-1](#)) in the following circumstances:

- An employee reports signs and symptoms of a possible CTD or an employee's doctor requests an ergonomic evaluation for the employee (complete as soon as possible, at least within 1 week of reporting).
- An employee requests an evaluation as a pro-active measure.
- As part of a general office audit when other employee's have reported CTDs or as part of an office move.

D. Control Measures

Ergonomics includes a three-tier hierarchy of controls which can be used to help prevent and manage CTDs.

1. Engineering Controls are the preferred method to prevent and control CTDs. (proper workstation layout, selection and use of ergonomic equipment - see [Attachment 54-2](#).)
2. Administrative Controls are management approved practices designed to reduce or prevent exposure to ergonomic risk factors. (job rotation, alternating tasks, ergonomic training)
3. Work Practice Controls are the employee's responsibility in working safely at the keyboard. (taking authorized mini-breaks, using proper work postures, pacing) - see [Attachment 54-3](#).

E. Training

Ergonomic training is needed for employees assigned to jobs that require four or more hours per day of working at the keyboard. The training course content will include the following:

1. The signs, symptoms, and consequences of CTDs.

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2. The importance of early reporting of CTD symptoms.
3. Site specific exposures associated with CTDs.(i.e., word processing, data entry, 10-key calculators, CAD designers)
4. Methods used to minimize CTDs.

F. Health Care Management

Effective case management for CTDs is an essential element of a successful ergonomics program. If CTDs are recognized and treated appropriately early in their development, more serious conditions can be prevented.

Based on the severity of symptoms reported by an employee, a decision will be made by the OHS or H&S Representative and employee whether conservative treatment can be initiated, or prompt referral to a physician is indicated.

If the symptoms are mild and intermittent, applying cold or warm compresses for 15 minutes 2-3 times per day, taking over-the-counter anti-inflammatory medication with food, and modifying the workstation and work practices may relieve the symptoms.

If the symptoms are moderate to severe and persistent (have been occurring eight consecutive days or longer), the employee should be referred to a knowledgeable occupational physician. The physician will be informed by the company of the job tasks performed by the employee. The physician selected should be trained in prevention, early recognition, evaluation, treatment, and rehabilitation of CTDs, and in the principles of ergonomics and OSHA recordkeeping requirements.

Whenever possible, the company will accommodate physician ordered work restrictions by providing modified job assignments during rehabilitation of the CTD.

G. Program Evaluation

A follow-up evaluation must be conducted within 1-2 weeks following a workstation analysis in order to ensure that control measures were effective in reducing or eliminating the ergonomic risk factors and to assess if the implemented solutions reduced symptoms.

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In addition, long term indicators for the effectiveness of this ergonomic program will include annual review by Corporate Health and Safety Director, comparing the CTD incident rate and severity rate to previous years' rates.

5. Documentation Summary

Completed Incident Report forms and Workstation Ergonomic Checklists will be forwarded to the OHS and Division H&S Manager and will be maintained for a minimum of five years.

6. Resources

- A. Workstation Ergonomic Checklist – [Attachment 54-1](#)
- B. Ergonomic Posture – [Attachment 54-2](#)
- C. Stretching Exercises – [Attachment 54-3](#)
- D. Back Injury Prevention - [SMS 045](#)
- E. Office furniture – Contact URS Purchasing Department (425-385-2016) for assistance with company-authorized desks and chairs.
- F. NIOSH Elements of Ergonomics Programs
<http://www.cdc.gov/niosh/ephome2.html>
- G. U.S. OSHA: Ergonomics, Frequently Asked Questions
<http://www.osha-slc.gov/ergonomics-standard/faq-overview.html>
- H. WorkSafe Australia: Guidance Note for the Prevention of Occupational Overuse Syndrome in Keyboard Employment [NOHSC:3005 (1996)]
http://www.worksafe.gov.au/publications/fulltext/toc/00997_01.htm
- I. California Title 8 General Industry Safety Orders Section 5110, Ergonomics
<http://www.ergoweb.com/Pub/Info/Std/calstd.html>
- J. Canadian Centre for Occupational Health and Safety
<http://www.ccohs.ca/oshanswers/ergonomics/office/office.htm>

URS SAFETY MANAGEMENT STANDARD

Health and Safety Training

1. Applicability

This SMS applies to all URS personnel. These are the minimum Environmental, Health and Safety (EHS) 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. Each location or project manager is responsible for ensuring documentation and informing employees of these additional requirements.

2. Purpose and Scope

This SMS 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 program 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 clients, and to protect company property and the environment.

3. Implementation

Location Location Manager is responsible for ensuring compliance with this program 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).

Projects Project Manager is responsible for ensuring project-related compliance (e.g., compliance of project staff members) with this program and any additional training necessary because of specific project activities.

Corporate HS Training Coordinator (CTC) The CTC is responsible for maintaining the corporate training calendar, filing original records/tests, issuing certificates, maintaining and issuing corporate training materials, helping to develop materials that meet requirements, adding approved courses and course information to the corporate training database, updating the intranet site with course information.

4. Requirements

Employee training requirements are dictated by the work each employee performs (or are expected to perform) and the geographic area(s) where they perform these activities. In most cases there is a regulatory driver for specific training. Attachment 55-1 shows a decision tree designed to help employees and managers determine training requirements.

- A. Health & Safety Orientation: All URS employees must be informed as to existence of and basic content of the URS Health and Safety Program. Locations will have the option of selecting the appropriate method of delivery but the content of this orientation must include at a minimum:

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1. Review of the URS EHS policy statement
2. The Management System
3. The URS H&S Organization
4. Overview of the Safety Management Standards and Hazard Assessment Process
5. Incident Reporting ([SMS 049](#))

Based on job assignment, additional training covered during this orientation:

6. Office Ergonomics ([SMS 054](#))
7. Hazard Communication (US) or WHMIS (Canada)
8. Emergency Procedures (emergency action plans, evacuation plans, fire alarms, gathering points, emergency communications)

B. Table 1 contains 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.

TABLE 1

Course Title	Regulatory Requirement	Frequency	Audience	Comments
Hazardous Waste Operations (40-Hrs - U.S.) (24-Hrs- non U.S.)	Y	Once	Anyone performing work or expected to perform at hazardous waste sites or treatment, storage, and disposal facilities	
Hazardous Waste Operations – Refresher (8 Hrs - U.S.) (4 Hrs - non-U.S.))	Y	Annually	(See above)	
Hazardous Waste Operations – Supervisor (8 Hrs)	Y	Once	Required for anyone serving as the site supervisor at a hazardous waste site.	
Field Safety (4 Hrs)	N	Biennially	Required for all URS non-craft employees performing field work that are not in hazardous waste training program.	Specific content will depend on the office and the employees' expected work.
Health & Safety Orientation	Y	Once	Required for all URS employees.	Specific content will depend on the office and the employees' expected work.
Respiratory Protection ¹	Y	Annually	Required for any employee who may be required to wear a respirator.	Initial training is approximately 1 hr. Annually refresher training and fit testing is approximately .5 hrs.

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Course Title	Regulatory Requirement	Frequency	Audience	Comments
Hazardous Materials Shipping ¹	Y	Biennially	Required for anyone who packages, labels, transports, completes paperwork for, or offers for shipment, hazardous materials/dangerous goods	
Bloodborne Pathogens ¹	Y	Annually	Required for anyone designated as a first aid responder or others who have a potential bloodborne pathogen exposure.	
First Aid	N	Biennially	Required for Hazardous Waste Site Safety Officers and personnel at remote sites (e.g., no local emergency medical response).	
Hazard Communication ¹	Y	Initially and if hazards change	Required for anyone who is potentially exposed to/works with hazardous chemicals	Training must occur before any work with hazardous chemicals. Included (as needed) in H&S Orientation. After the initial training, required updates will typically be handled as part of project specific H&S training.

¹This material is covered in the Hazardous Waste Operations initial and annually refresher courses, however individuals who are not Hazardous Waste Operations staff may be required to take one or more of these courses based on their work activities and as required by federal regulations.

- C. Attachment 55-1 is a tool used to identify *additional* training requirements. These requirements may be necessary due to the individual's project or office activities, or the location of the facility. The responses to this simple questionnaire dictate what training an individual needs above and beyond the basic URS courses. Each employee, once these requirements have been identified, 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, corporate training materials should be used as the base materials whenever they are available. Trainers may always elect to supplement the base corporate training materials for these courses with project/office/geographic unit specifics.
- F. For training requiring certifications (regulatory or corporate) trainers must be regional or divisional H&S Managers or be approved by the Corporate Health and Safety Director. This training includes but is not limited to, Hazardous Waste Health and Safety courses and Field Safety Training.
- G. Training is offered in a variety of formats including classroom instruction, computer-based training (CBT), and on-the-job (OTJ) training. To ensure consistency 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 Corporate Health and Safety Director or a designee (e.g., Divisional or Regional H&S

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- Manager). Local, regional or divisional H&S staff will be able to assist in identifying qualified external vendors when the need arises.
- H. Internal training course schedules will be posted on the Health and Safety intranet site at <http://healthandsafety.com/> .
- I. URS staff is expected to be familiar with applicable training requirements. In addition to the corporate training tracking. Staff members are expected to track their own progress toward meeting those requirements.

5. Documentation Summary

- A. Those courses shown in Table 1 will be tracked in a corporate training database. These courses were selected for a variety of reasons including:
1. Audits/compliance checking
 2. Written certification requirements
 3. Easy access to qualified individuals for project/office staffing purposes
- B. All training must be documented using Training Attendance form (Attachment 55-2) and Course Agenda. Minimum course agenda requirements include:
- Type of course
 - Course date
 - Course location
 - Topics covered
 - Length of time covered for each topic
 - Course duration (start / end times)
 - Instructor(s) name
- C. For client/vendor provided training, training documentation must include:
- Copy of the attendee's course certificate
 - Course agenda
- D. Divisional H&S Managers will ensure the course agenda meet regulatory/company requirements. The Corporate H&S Training Coordinator will then enter attendance records in the corporate training database.

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- E. Original attendance sheets, agendas, and any completed tests will be sent to the Corporate H&S Training Coordinator. These should be filed by course then by date for easy access/auditing.
- F. Locations/projects will maintain records on any project or location specific training requirements such as fire extinguisher training, project H&S plan training, and chemical hygiene program (laboratory safety) training. They may optionally elect to maintain copies of attendance records for courses also being tracked corporately.
- G. For courses requiring certification, certificates will be issued by the Corporate Health and Safety Director, unless the certificate is issued by a vendor or client. Under those conditions a copy of the certificate must be provided to the Corporate H&S Training Coordinator (along with course content information and sign in sheets).
- H. Managers (local, regional, project) can access the information for staffing and compliance purposes through the Divisional H&S Managers or Corporate H&S Training Coordinator. Divisional H&S Managers will have “read only” access to the corporate training database.

6. References

The following are sites that provide additional information to assist you in identifying training requirements.

- A. OSHA website training section (U.S. Regulatory Requirements)
<http://www.osha-slc.gov/Training/>
- B. National Occupational Health and Safety Commission (Australia)
<http://www.nohsc.gov.au/work/education/index.htm>
- C. European Agency for Safety and Health at Work
<http://europe.osha.eu.int/training/>
- D. Additional Training Requirements Evaluation - Attachment 55-1
- E. Training Attendance Form - Attachment 55-2



Health and Safety Program
ADDITIONAL H&S TRAINING EVALUATION

Attachment 55-1

Name _____ Location _____ Date _____

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required ✓	Comments
Asbestos Inspector	Y	Annual	You perform asbestos sampling tasks.		Not offered in-house
Asbestos Planner	Y	Annual	You serve as the project asbestos planner.		Not offered in-house
Confined Space Entry	Y	Once	You perform confined space entry/authorizer/attendant duties (including anyone performing non-entry rescue activities).		Tracked in corporate database.
Confined Space Refresher	N	As needed	Recommended if you perform entry activities.		
Confined Space Rescuer	Y	Once	You may have to enter a confined space to perform a rescue		Not offered in-house. Tracked in corporate database.
Construction Safety OSHA 500		Once	Recommended if you are a Supervisor and/or Safety Officers at Construction Sites		Tracked in corporate database.
Emergency Action Plan	Y	Once	You are assigned to and at least occasionally work at a fixed facility in the US. This should be covered in EHS Orientation.		For field/site personnel this will be covered in project/site safety training.
Excavations/Trenching Awareness	Y	Once	You work at sites where excavation/trenching tasks are performed.		Covered in HAZWOPER and Field Safety
Excavations/Trenching Competent Person	Y	Once	You are or may be designated as a competent person (educational background and experience may allow for grand-fathering)		Tracked in corporate database.
Fall Prevention/Protection	Y	Once	You supervise tasks or perform tasks at heights (on roofs, scaffolding, ladders, unfinished flooring).		Tracked in corporate database.
Fire Extinguisher	Y	Annual	You may be expected to use fire extinguishers (fixed facilities and project sites)		
Powered Industrial Trucks (Forklifts)	Y	Once	Your job assignments includes operating a powered industrial truck (forklift)		Required more frequently if required assessments indicate the need.
General Industry Safety	N	Once			See Field Safety



Health and Safety Program

Attachment 55-1

ADDITIONAL H&S TRAINING EVALUATION

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required ✓	Comments
H&S Issue for Project Managers	N	Once	Required if you manage projects with field work.		Will be offered as part of PM Training
Hazard Communication	Y	Once	You work with or around hazardous materials in a US facility (includes URS facilities and client facilities)		Tracked in corporate database. Typically included in H&S Orientation.
HAZWOPER HazMat Team	Y	Once	Emergency Response Team Members (First Responders Operations Level, HazMat Technicians and Incident Commanders)		Tracked in the corporate training database.
Hearing Conservation	Y	Annual	Employees exposed to noise at or above 85 decibels averaged over an 8 hour day.		Covered in HAZWOPER Refresher and Field Safety
Injury/Illness Prevention	Y	Once	You are assigned to CA offices		Covered in CA office H&S Orientation.
Laboratory Safety	Y	Once	You work in a fixed or mobile wet chemistry lab.		
Lead Inspector	Y		You are a project lead inspector.		Not offered in house.
Lead Planner	Y		You are a project lead planner.		Not offered in house.
Lockout/Tagout	Y	Once	You work with and around equipment that may need to be locked out/tagged out. (You are not responsible for applying tags/locks)		General awareness covered in HAZWOPER and Field Safety
Nuclear Density Gauge Operator	Y	Once	You operate nuclear density gauges		
Radiation Safety Officer	Y	Once	You are designated as a Radiation Safety Officer		
SCBA/Cascade Systems	Y	Once	Required for any employee required to wear SCBAs or to operate a supplied air system.		Part of Project H&S training as needed.
Shipping Specialist	Y	Once	You are designated as a Shipping Specialist and/or are a Regional H&S Manager.		Updates are required as regulations change. Tracked in the corporate training database.
Substance Specific	Y	Once	Any employee potentially exposed to a substance covered by the 29 CFR substance specific regulations. SMS 050 .		Includes lead, asbestos, benzene, etc.
Waste Awareness	Y	Annual	You generate, handle or manage hazardous waste at a fixed facility or		Updates/refreshers can be part of Project H&S



ADDITIONAL H&S TRAINING EVALUATION

Course Title	Regulatory	Frequency	Should You Attend?	Check if Required ✓	Comments
			field project.		training.
Waste Specialist	Y	Once with Annual Refresher	You are responsible for waste management at a small or large quantity generator facility.		
Welding/Brazing/Cutting	Y		You job duties include these activities		
WHMIS	Y		You are assigned to a Canadian facility and work with or around hazardous materials.		Canadian "HazCom"

URS SAFETY MANAGEMENT STANDARD

Vehicle Safety Program

1. Applicability

This procedure applies to URS Corporation's U.S. operations. A violation of this policy is subject to disciplinary action up to and including termination.

2. Purpose and Scope

The purpose of this procedure is to help insure that people driving for the URS Corporation do so in a safe manner.

This Safety Management Standard (SMS) applies to employees operating motor vehicles that are owned, rented or leased by the Company, and the use of personal vehicles while on Company business.

This SMS does not apply to heavy equipment operations (see SMS 019).

3. Implementation

The overall responsibility for program implementation is with the URS Health and Safety Director. Other responsibilities include:

Administration - Fleet management, Vehicle Safety Program, vehicle acquisition, insurance claims reporting, controlling access to vehicles, maintenance of vehicles, participating on accident review.

Human Resources - Documentation of driver's license, discipline.

Health and Safety - Employee safety training, maintenance of the vehicle safety program, participation on the accident review committee.

Employee - Familiarization with URS Vehicle Safety Program, compliance with its requirements.

4. Requirements

A. Authorized Drivers

1. Authorized Drivers are those individuals permitted to drive URS owned, leased, or rented vehicles. Employees that only operate rental cars obtained on a daily basis through URS National Service Agreements are not required to be designated as Authorized Drivers.
2. Must be at least 18 (non-commercial license) or 21 (commercial license) years of age and have a current driver's license for the appropriate class of vehicle (unless more stringent requirements are established by the leasing/renting agency).
3. Human Resources and Office Administrators requires new employees and current employees (on an annual basis), designated as Authorized Drivers, to provide a copy of their driver's license. Authorized drivers who

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Vehicle Safety Program

lose their license through legal action must notify their Human Resources Representative immediately. The Human Resources Representative will notify the Fleet Manager.

4. The Company may suspend the privilege to operate vehicles on Company business due to non-compliance with the URS Vehicle Safety Program, involvement in a motor vehicle accident, or motor vehicle violations.
5. Authorized drivers must review the Vehicle Safety Program (SMS 057) and sign the Drivers Information form (Attachment 57-2).
6. Non-URS employees (e.g., subcontractors, alliance partners) may operate URS vehicles only when this activity is specifically agreed to in the applicable contract.

B. Training

1. Authorized Drivers shall be provided basic driver safety training, including a review of the URS Vehicle Safety Program (SMS 057) and video or on-line training, within 6 months of the effective date of this SMS or within 3 months of their hire date.
2. Additional training may be required for select employees based on accident involvement.

C. General Operating Policy and Procedure (Applies to Authorized and Non-Authorized Drivers Operating Motor Vehicles on Official Company Business)

1. Company owned/rented/leased motor vehicles may be operated only by properly licensed employees who are specifically authorized to drive Company vehicles.
2. Authorized drivers required to operate vehicles with special hazards (i.e. trucks carrying fuel cells, vehicles used to tow trailers, vehicles with limited visibility, etc.) shall be thoroughly briefed on the hazards and control measures necessary for safe operation of the vehicle. The local office shall maintain documentation of the briefing.
3. Drivers/operators shall know and obey all federal, state and local motor vehicle laws applicable to the operation of their vehicle.
4. A driver shall not permit unauthorized persons to operate a Company-owned/rented/leased vehicle.
5. URS policy regarding reimbursement and insurance coverage requirements for use of personal automobiles may be found in the Policy and Procedures Manual (Section 074.020).
6. All cargo extending 4 feet or more beyond the end of a truck, trailer or similar vehicle shall be clearly marked with a red warning flag or cloth measuring no less than 16 inches square. Red lights must be used at night.

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7. Company owned/rented/leased vehicles are for official business use only and are not to be used for personal activities without the specific approval of a Division Manager, Senior Vice President, or above.
8. Seat belts and shoulder harnesses (occupant restraint systems) shall be worn or used whenever the vehicle is in operation. The vehicle may not move until all passengers have fastened their restraints.
9. When parking or leaving a vehicle, the following procedures must be followed: Shut off the engine, engage the transmission in park (automatic transmission) or first gear (standard transmission), set the parking brake, remove the ignition keys, and lock the vehicle.
10. The vehicle's engine is to be turned off during refueling. Smoking or cell phone use is not allowed while refueling.
11. Drivers/operators will not drive or operate vehicles while under the influence of alcohol or illegal drugs. Further details on the URS Substance Abuse Policy may be found in the Policy and Procedure Manual (section 034.030).
12. Drivers/operators will not drive or operate vehicles while under the influence of medications when told by a physician, another healthcare provider, or the manufacturer (i.e. instructions on the label) that the activity is unsafe.
13. Vehicle operators are responsible for any fines levied by law enforcement agencies for the operation of their vehicles.
14. Articles, tools, equipment, etc. placed in vehicles shall be stored as not to interfere with vision or the proper operation of the vehicle in any way. This also includes preventing items from flying about or out of the vehicle during sudden stops, turning, etc.
15. Trucks or vehicles with obstructed rear-view mirrors must observe the following procedures when backing up: Position an employee to act as a spotter at the rear of the vehicles, in the driver's line of sight, to ensure that the area behind the truck is clear. If no other employee is present, then the driver must step out of the vehicle and check the area behind the vehicle before backing up. As an added precaution, avoid backing up whenever possible.
16. Driver/operators may not deactivate or muffle any backup warning device.

D. Field Site Vehicle Safety

1. Define specific vehicle travel routes and parking areas at field sites. Use fencing, cones or other markings to define roads and parking.
2. If parking on the shoulder of an active road, park as far off the road as possible.
3. If work is required alongside an active road (e.g., surveying) park the vehicle behind the area of work to provide a barrier against out-of-control vehicles.

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4. URS will not transport DOT-placard quantities of hazardous materials. However, small quantities of hazardous materials (e.g., sample coolers) may be transported if properly packaged. Be careful to prevent chemical contamination of the vehicle. Further details on DOT shipping may be found in the DOT Shipping SMS 048.
5. Nuclear density meters (e.g., Troxler units) may be transported only by employees who have been trained in the use of nuclear density meters (see SMS 044). Nuclear density meters must be secured from movement and locked during transport. NRC and state-specific regulations regarding transport documentation also apply.
6. When performing fieldwork requiring the blocking of traffic lanes (e.g., bridge inspection), follow URS SMS 032, the Manual on Uniform Traffic Control Devices for Streets and Highways (ANSI D6.1) and local police requirements for barriers, cones, and flaggers.
7. No employee may ride in the bed of a pickup truck unless seating and restraints are provided for this specific use.

E. Accident Response and Reporting

1. In case of injury, call or have someone else call, 911 immediately for emergency assistance. If you are involved in an accident and are not injured, do the following:
 - a. Protect the accident scene.
 - b. Do not admit liability or place any blame for the accident.
 - c. Provide only your name, address, driver's license number, and vehicle insurance information.
 - d. Obtain the following:
 - i. name(s), addresses, and telephone number(s) of the owner
 - ii. driver and occupants of other vehicle(s)
 - iii. the owner's insurance company
 - iv. driver's license number
 - v. year, make, model and license number of the vehicle(s)
 - vi. name(s) and addresses of any witnesses
 - e. **DO NOT:**
 - Call the insurance company; the Fleet Manager's office will do this (unless the incident involves your personal vehicle).
 - Give a statement to the press.
 - Give a signed statement to the claims adjuster representing the other driver's insurance company.

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NOTE: The Auto Claim Report (Attachment 57-1) for Company-leased or owned vehicles is located in the vehicle glove compartment. The driver must complete this form at the scene of the accident and submit it to management.

2. Notification

All accidents with a Company-leased, rented, or owned vehicle must be reported to your Office/Branch Manager/Supervisor and Fleet Manager within 24-hours of the time it occurs. Use the Auto Claim Report (Attachment 57-1) for this purpose. The Fleet Administrator will report the accident to the insurance carrier (leased and owned vehicles only) promptly .

F. Accident Review

1. The Fleet Manager will review all accidents involving URS-owned, rented or leased vehicles. Accidents involving any of the following will result in immediate disciplinary action in coordination with Human Resources:
 - a. Driving under the influence of alcohol or illegal drugs
 - b. Reckless driving
 - c. Driving without a license
 - d. Hit-and-run driving
 - e. Repeat accidents involving the same employee,
 - f. Unauthorized use of Company vehicles.
2. Disciplinary action includes possible:
 - a. Loss of URS driving privileges
 - b. Additional driver safety training
 - c. Suspension without pay
 - d. Termination

G. Inspection

1. The driver is responsible for inspecting the vehicle prior to use and not driving a vehicle with obvious safety defects.
2. Basic safety checks must include:
 - a. Tire condition/pressure
 - b. Lights/turn signals
 - c. A clean windshield and adequate window washer fluid
 - d. Gauges/warning lights indicating a normal condition
 - e. Mirrors properly adjusted
 - f. Brakes with adequate pedal pressure for proper braking

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3. Any defects must be reported to the local office Fleet Representative/Office Administrator.

H. Vehicle Maintenance

1. The Office Administrator (or designee) is to ensure that all URS-leased/owned vehicles are properly maintained.
2. Routine maintenance must be performed in accordance the schedule provided in the owner's manual stored in the vehicle.
3. Reported defects/problems with vehicles must be repaired promptly.

5. Documentation Summary

- A. Auto Claim Report - ([Attachment SMS 57-1](#))
- B. Driver's Information - ([Attachment SMS-57-2](#))

6. References

The following sites provide additional information to assist you:

- A. National Safety Council; Information on Defensive Driving Courses
<http://www.nsc.org/psg/ddc.htm>
- B. AAA Foundation for Traffic Safety
<http://www.aaafoundation.org/>

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Cold Stress

1. Applicability

This procedure applies to URS projects where field crews are working outdoors in damp and cool (below 50° F or 10°C) conditions or anytime temperatures are below 32°F or 0°C.

2. Purpose and Scope

The purpose of this procedure is to protect project personnel from the following conditions:

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 may be seen in Attachment 59-1.

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.

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Cold Stress

3. Implementation

Field Activities - Implementation of this procedure is the responsibility of the Project Manager and the field supervisor.

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.
- C. Observe and monitor weather conditions such as ambient temperature, wind speed, and precipitation while in the field. Use Attachment 59-2 to determine wind chill.
- D. Wear at least 3 layers of clothing.

- An outer layer to break the wind and allow some ventilation (e.g., Gortex® or nylon)
- A middle layer of down, wool, or similar materials to provide insulation
- An inner layer of cotton or synthetic weave to allow ventilation

In addition:

- Wear a hat. Up to 40% of body heat can be lost when the head is left exposed.
- Wear insulated boots or other insulated footwear.
- Keep a change of dry clothing available in case work clothes become wet.
- Do not wear tight clothing. Loose clothing allows better ventilation.

- E. Use the following work practices:

- Use Attachment 59-3 to establish work/rest cycles in cold weather.
- Drink plenty of warm liquids. It is easy to become dehydrated in cold

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Cold Stress

weather.

- Avoiding caffeine and alcohol. Alcohol will accelerate loss of body heat.
 - Eat high calorie snacks to help maintain body metabolism.
 - If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold.
 - Work in pairs to keep an eye on each other and watch for signs of cold stress.
 - NEVER IGNORE SHIVERING. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
 - Avoid exhaustion.
- F. When possible, use the following engineering controls:
- Provide shelter to escape cold, wind and precipitation
 - Provide a source of heat (such as warm packs or portable heaters)
 - Use insulating materials on equipment handles when temperatures drop below 30°F or -1°C.
- G. Watch for symptoms and signs of hypothermia (see Attachment 59-1).
- H. Treat cold stress illness as follows:
- Hypothermia: Prompt treatment of hypothermia is essential. Once the body temperature drops below 95°F or 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, removal of wet clothing, applying external heat (such as a pre-warmed sleeping bag, electric blanket, or body-heat from other workers) and follow-up medical attention.
 - Frost Bite: The initial treatment for frostbite includes bringing the individual to a warm location, removal of 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

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Cold Stress

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 Attachment 59-1

I. Hypothermia in Water:

Loss of body heat to the water is a major cause of deaths in boating accidents. 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 two to three degrees by dilating the blood vessels. Do not drink alcohol around cold water. The following table shows the effects of hypothermia in water:

WATER TEMPERATURE	EXHAUSTION	SURVIVAL TIME
32.5° F (0°C)	Under 15 min.	Under 15 to 45 min.
32.5 to 40°F (0 – 4°C)	15 to 30 min.	30 to 90 min.
40 to 50°F (4 – 10°C)	30 to 60 min.	1 to 3 hrs.
50 to 60°F (10 – 16°C)	1 to 2 hrs.	1 to 6 hrs.
60 to 70°F (16 – 21°C)	2 to 7 hrs.	2 to 40 hrs.
60 to 70°F (16 – 21°C)	3 to 12 hrs.	3 hrs. to indefinite
Over 80°F (27°C)	Indefinite	Indefinite

SOME POINTS TO REMEMBER:

- Wear your PFD. Review [SMS 053](#) - Marine Safety and Boat Operations.
- If water is less than 50°F (10°C), wear a wet suit or dry suit for work in water (e.g., wading) or if significant potential to fall in water.
- 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.

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- Keep a positive attitude about your rescue. This will increase your chances of survival.
- 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:

- recognition of the signs and symptoms of cold injury or impending hypothermia,
- proper re-warming procedures and appropriate first aid treatment,
- proper use of clothing,
- proper eating and drinking practices
- safe work practices appropriate to the work that is to be performed.

5. Documentation Summary

File these records in the Project Safety File.

- A. Completed Project Hazard Analysis form (see Health and Safety Website – “Hazard Analysis”)
- B. Cold stress training records

6. Resources

- A. OSHA Fact Sheets – “Protecting Workers in Cold Environments”
http://www.osha-slc.gov/OshDoc/Fact_data/FSNO98-55.html
- B. Attachment 59-1 “Signs of, and Treatment for, Cold Stress related Illnesses”
- C. Attachment 59-2(a) “Wind Chill Index” (units in °F and miles/hour)
- D. Attachment 59-2(b) “Wind Chill Index” (units in °C and Kilometers/hour)
- E. Attachment 59-3 “TLVs Work/Warm-up Schedule for Outside Workers based on a Four-hour Shift”

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Cold Stress

Attachment 59-1
Signs of and Treatment for Cold Stress Related Illnesses

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

Source: Princeton University, Department of Environmental Health and Safety, posted 2/2/99.

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Attachment 59-2(a)
Wind-Chill Index¹
 (miles per hour and °F.)

	ACTUAL THERMOMETER READING (°F)									
	50	40	30	20	10	0	-10	-20	-30	-40
Wind speed in mph	EQUIVALENT TEMPERATURE (°F)									
calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	Little Danger (for properly clothed person)				Increasing Danger (Danger from freezing of exposed flesh)			Great Danger		

¹ Source: Fundamentals of Industrial Hygiene, Third Edition. Plog, B.A., Benjamin, G.S., Kerwin, M.A., National Safety Council, 1988

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Attachment 59-2(b)
Wind-chill Index¹
 (Kilometers per hour and °C.)

Estimated wind speed	Actual temperature reading (°C)												
	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
(in km/h)	Equivalent chill temperature (°C)												
0 (Calm)	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
8	9	3	-2	-7	-12	-18	-23	-28	-33	-38	-44	-49	-54
16	4	-2	-7	-14	-20	-27	-33	-38	-45	-50	-57	-63	-69
24	2	-5	-11	-18	-25	-32	-38	-45	-52	-58	-65	-72	-78
32	0	-7	-14	-21	-28	-35	-42	-50	-56	-64	-71	-78	-84
40	-1	-8	-16	-24	-31	-38	-46	-53	-60	-67	-76	-82	-90
48	-2	-10	-17	-25	-33	-40	-48	-55	-63	-70	-78	-86	-94
56	-3	-11	-18	-26	-34	-42	-50	-58	-65	-73	-81	-89	-96
64	-3	-11	-19	-27	-35	-43	-51	-59	-66	-74	-82	-90	-98
(Wind speeds greater than 64 km/h have little additional effect.)	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.					

The table was originally developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA, and is adapted from the 1995-1996 *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 chill temperature requiring dry clothing to maintain core body temperature above 36°C (96.8°F).

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Attachment-59-3

TLVs Work/Warm-up Schedule for Outside Workers based on a Four-hour Shift*

The ACGIH has adopted the guidelines developed by the Saskatchewan Labour for working outdoors in cold weather conditions. These guidelines recommend protective clothing and limits on exposure time. The recommended exposure times are based on the wind chill factor, a scale based on air temperature and wind speed. The work-break schedule applies to any four-hour period with moderate or heavy activity. The warm-up break periods are of 10-minute duration in a warm location. The schedule assumes that "normal breaks" are taken once every two hours. At the end of a 4-hour period, an extended break (e.g. lunch break) in a warm location is recommended. More information is available in the ACGIH publications "2000 TLVs and BEIs" and "Documentation of TLVs and BEIs" and on the Saskatchewan Labour web page "[Cold Conditions Guidelines for Outside Workers](#)".

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	Max. Work Period	No. of Breaks	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					

*2000 TLVs and BEIs - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati : American Conference of Governmental Industrial Hygienists (ACGIH), 2000 - page 176. Adopted from Saskatchewan Labour "[Cold Conditions Guidelines for Outside Workers](#)"

ATTACHMENT 2

CONTACT LIST

BADAMI CONTACT LIST

Medical Services	Onsite	Badami	Notes
Medical services	Onsite emergency care limited to first aid.	Badami Medical Clinic (907) 659-1327	Clinic located in Main Camp Emergency numbers are: · Badami Emergency (907) 659-1200
Environmental Services	Onsite	Badami	Notes
Routine environmental services including waste management advice, manifesting, fluid transfers, minor spill management.		Technical help available through Badami environmental contact Del Sandvik or Alex Reyes at (907) 659-1243	Contractor expected to provide cleanup of minor spills. Environmental contact will provide guidance on disposal of spill cleanup waste and field spill information to ACS/SRT Techs and to Environmental Advisor for agency reporting.
Emergency environmental services including large controlled or uncontrolled spills.		Badami emergency number (907) 659-1200.	
Emergency Response Team Services	Onsite	Badami	Notes
Fire/exposure protection	Incipient response	Badami IMT activated with BPXA resources deployed as needed	Emergency number is · Badami Emergency (907) 659-1200 · Badami Control Room (907) 659-1300
Rescue/extraction	Initial response as possible	Additional support as needed	Emergency number is · Badami Emergency (907) 659-1200 · Badami Control Room (907) 659-1300
HazMat response team	Initial response as possible	Additional support as needed	Emergency numbers are · Badami Control Room (907) 659-1200

Attachment B
Field Notes

**POINT THOMSON GAS CYCLING
PROJECT**

**NPDES SURFACE WATER
SAMPLING EVENT**

2002 FIELD NOTEBOOK



URS Corporation
2700 Gambell Street, Suite 200
Anchorage, AK 99503
26218846.06000

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 0950 Sample Type: Marine Water
 Name of Samplers: STS/KHN
 Location ID: SW1 Sample ID: PTU3-SW1 Photo#: 1

Coordinates: 70° 11.567 N 146° 43.228 W

Sample Location description (Sketch) Location is on E side of pad approximately half way down the length of pad in marine water ~ 400' S of spit at water/pad interface



WATER PARAMETERS

pH 7.94 Conductivity 45.8 μm/cm Turbidity — DO 10.37 mg/L Temp 0.3 °C Salinity 2.71‰

Water color and clarity Water is moderately turbid, with light orange/brown color

Pond size (dimensions/approximate depth) _____

Appearance of bottom sediment and surrounding sediment bottom sed is gravel with fine silt and clays and is in area adjacent to gravel pad

Vegetation present no vegetation visible in area sampled

Odor or sheen present on water surface None

Observations of aquatic life none but organic material abundant in water (root and other plant pieces)

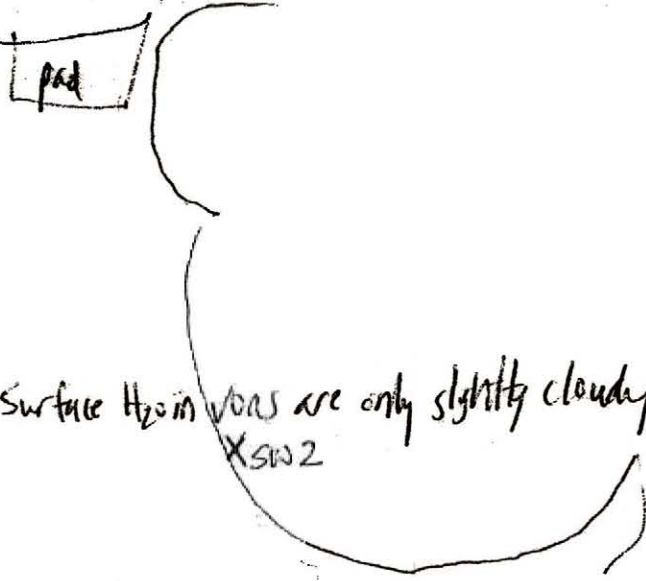
Connection/communication with other water bodies Area inside the spit connects with Peabody Sea and Estuarine bodies to the South

Other: _____

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1035 Sample Type: Marine Water
 Name of Samplers: Sharon Sullivan & Kelley Nguyen
 Location ID: SW2 Sample ID: PTU3-SW2 Photo#: 2
 Coordinates: 70° 10.189N 146° 14.996W

Sample Location description (Sketch)



sediment load increases w/ depth organic pieces. Surface H₂O in vials are only slightly cloudy w/ some XSW2

WATER PARAMETERS

pH 7.94 Conductivity 46.1 mS/cm Turbidity — DO 10.67 Temp 6.1 °C Salinity 2.73

Water color and clarity murky water, moderately turbid, a little froth evident at sample location
 Pond size (dimensions/approximate depth) _____

Appearance of bottom sediment and surrounding sediment gravel bottom and beach w/ fines evident

Vegetation present no vegetation present

Odor or sheen present on water surface no odor or sheen evident

Observations of aquatic life no aquatic life, but organic pieces abundant

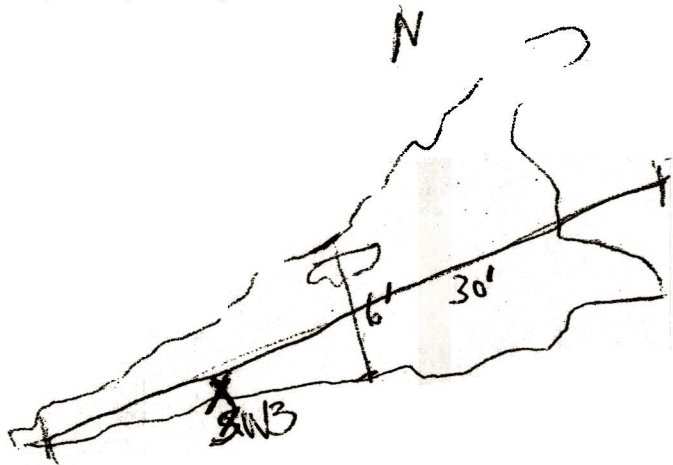
Connection/communication with other water bodies area inside the spit connects with the Beaufort Sea and estuarine bodies to the south

Other: _____

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/29/02 Sample Time: 10:55 Sample Type: Tundra Pond
 Name of Samplers: Sharon Sullivan / Kelley Noan
 Location ID: SW3 Sample ID: PTU3-SW3 Photo#: 3
 Coordinates: 70° 10.170 146° 15.120

Sample Location description (Sketch)



WATER PARAMETERS

pH 6.88 Conductivity 1.01 us/cm Turbidity - DO 13.27 Temp 0.3°C Salinity 0.03

Water color and clarity

Pond size (dimensions/approximate depth) long and narrow with splay at northern end.
About 30' x 6' at middle of length

Appearance of bottom sediment and surrounding sediment tundra mat at bottom

Vegetation present lots of organic mat at bottom (thick). Dead tundra
vegetation abundant in pond.

Odor or sheen present on water surface neither present

Observations of aquatic life some black bugs (tiny) in sample water.

Connection/communication with other water bodies interconnected with a few
nearby polygonal troughs

Other: water is frozen at about 1cm and above. KHN top 1/2 inch
H₂O is frozen KHN

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02

Sample Time: 1130

Sample Type: Fresh Tundra Water

Name of Samplers: STS/KHN

Location ID: SW4

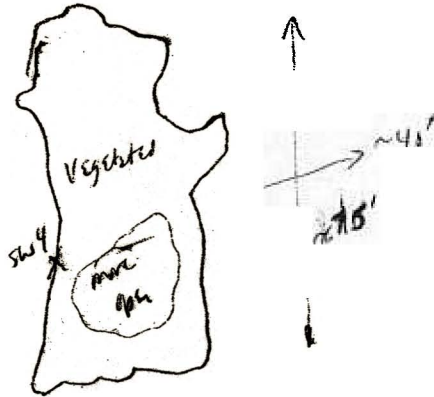
Sample ID: PTU3-SW4

Photo#: 9

Coordinates: 70° 10.155 146° 15.334

Sample Location description (Sketch)

Location is tundra area between gravel pad and large water body to the south - about half way between



Post sampling of location

WATER PARAMETERS (at 1150)
 pH 6.81 Conductivity 6.543 ms/cm Turbidity — DO -2.14 Temp 0.5 °C Salinity 0.02%
 7.116 0.547 6.45 0.6 °C 0.02%

Water color and clarity water is yellowish orange and fairly clear

Pond size (dimensions/approximate depth) 75 ft x 40 ft x 1.5 ft deep

Appearance of bottom sediment and surrounding sediment Reddish-brown sediment with abundant grasses. Southern portion of pond more open, other portions heavily vegetated

Vegetation present Abundant grasses inside and surrounding pond

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life small organisms present in water and sample

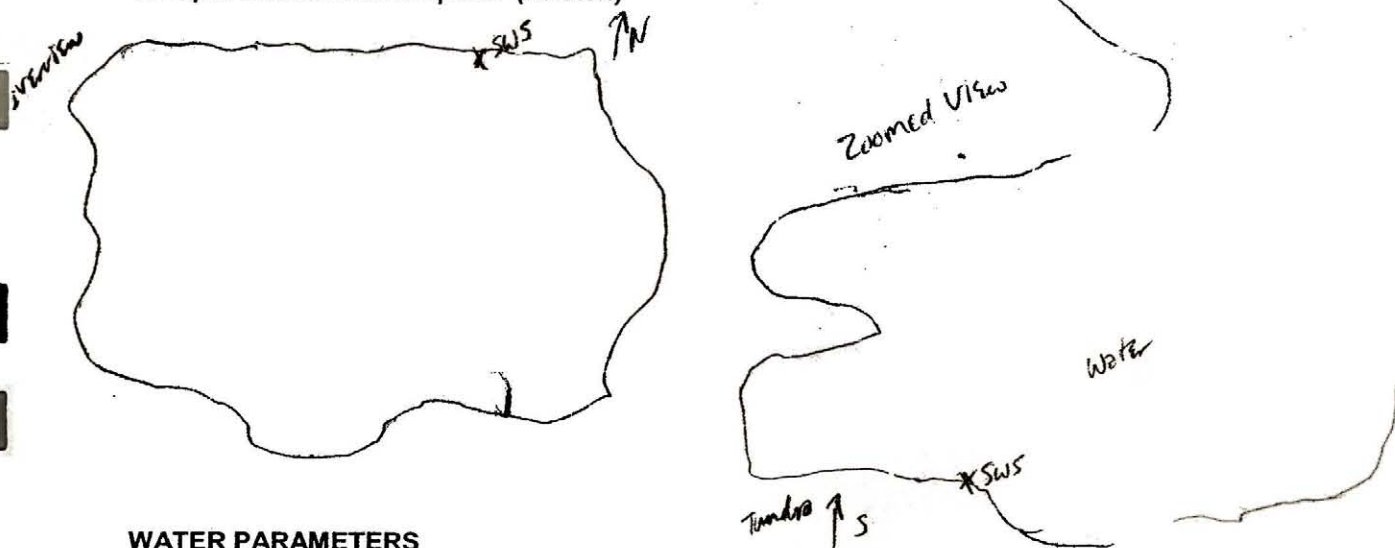
Connection/communication with other water bodies not connected to other water bodies

Other: ice covers pond and is ~ 1cm thick

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1200 Sample Type: Fresh water large tundra lake
 Name of Samplers: STS/KHN
 Location ID: SW5/SW14 (dup) Sample ID: PTU3-SW5 Photo#: 6
PTU3-SW14
 Coordinates: 70°10.084N 146°15.268W

Sample Location description (Sketch)



WATER PARAMETERS

pH 8.17 Conductivity 0.86 S/mS Turbidity — DO 12.11 mg/L Temp 0.4 °C Salinity 0.03‰

Water color and clarity Faint yellow colored water, clear

Pond size (dimensions/approximate depth) 1000' x 800' x >5' deep (1.5' deep at sample location)

Appearance of bottom sediment and surrounding sediment gravel and mostly fines on bottom

Vegetation present Vegetation as moss or algae scattered infrequently across bottom of lake near sampling area. Grasses line the northern shoreline

Odor or sheen present on water surface No odor or sheen present lower in water but very

Small black ^{red} bugs present near surface.

Observations of aquatic life no observable aquatic life in lower portions of water, but very

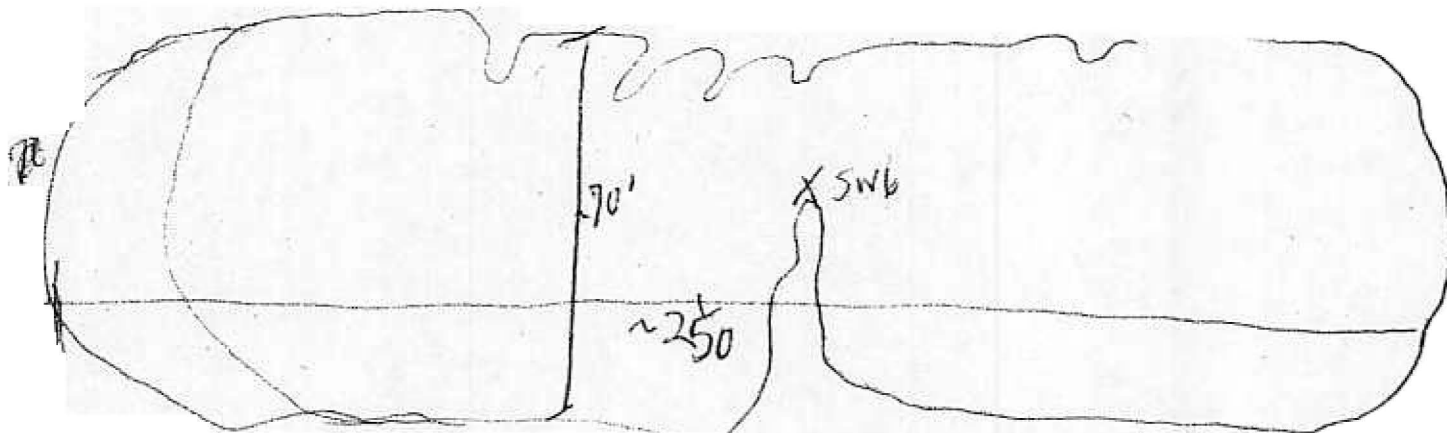
Connection/communication with other water bodies Potential connection to brackish water body located East of tundra lake at the southeast edge of lake based on recent aerial photography

Other: ICE is present on surface and is ~ 3/4 inch thick, one aluminum soda can near sample location in lake bottom

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1340 Sample Type: Turbid Pond
 Name of Samplers: Sharon Sullivan / Kelly Numa
 Location ID: SW6 Sample ID: PT43-SW6 Photo#: 7
 Coordinates: 70° 09.945 146° 16.059

Sample Location description (Sketch)



WATER PARAMETERS

pH 7.60 Conductivity 580 Turbidity - DO 10.42 Temp 11.1 °C Salinity 0.02%

Water color and clarity clear water = no color

Pond size (dimensions/approximate depth) 250' x 70'. 4 inches deep at sample location (depth to kill what depth to center is, but it looks very shallow)

Appearance of bottom sediment and surrounding sediment silty clay bottom

Vegetation present Some moss (algae) at edges and lightly scattered throughout, but mostly just clay. Grasses & moss (algae) at nearby fountain

Odor or sheen present on water surface Neither present

Observations of aquatic life water beetle, but and small reddish bugs.

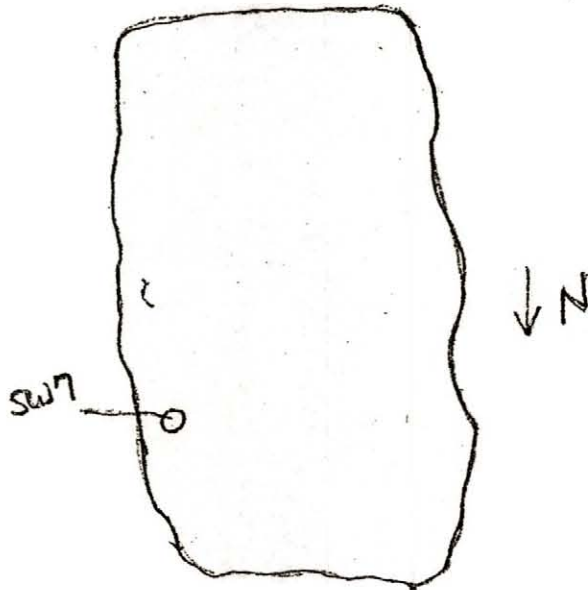
Connection/communication with other water bodies Not in communication w/ other ponds

Other: ice 1-1/4" thick in places, but water frozen everywhere.

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1410 Sample Type: Fresh water - 70m pond
 Name of Samplers: STS/KHN
 Location ID: SW7/SW15 (Amp) Sample ID: PTU3-SW7/SW15 Photo#: Photo 8
 Coordinates: 70° 09.942N 146° 16.059W

Sample Location description (Sketch)



WATER PARAMETERS

pH 8.13 Conductivity 0.488 Turbidity -- DO 12.16 Temp 0.9 °C Salinity 0.0%

Water color and clarity clear, colorless

Pond size (dimensions/approximate depth) 6-8 inches deep at sample point
pond is 800 x 100 x < 1 foot deep

Appearance of bottom sediment and surrounding sediment crayish brown silt and clay with
very fine muds surrounding shore

Vegetation present scarce vegetation beyond shoreline but some moss and grass

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life some water beetles and small orange bugs in the water

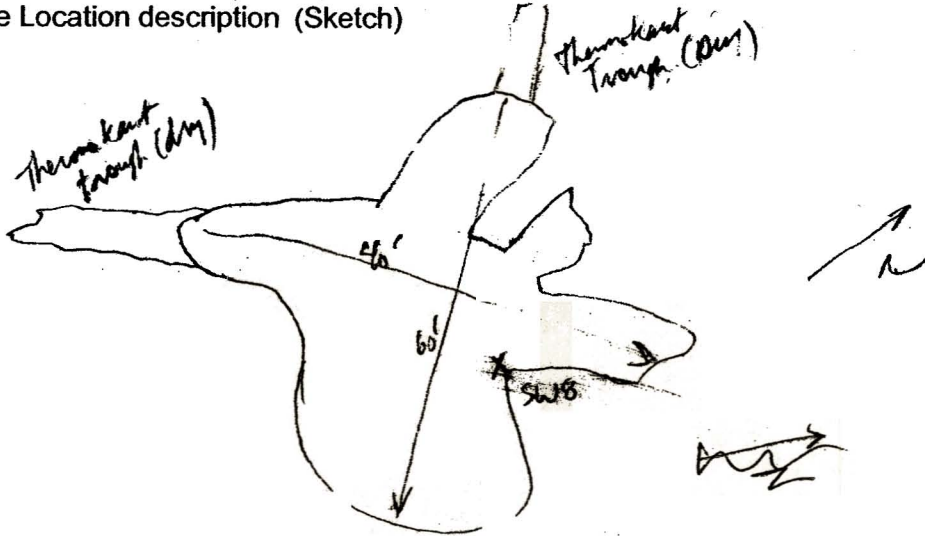
Connection/communication with other water bodies no communication with other water bodies

Other: Ice is present on surface and is ~1/4 inch thick. Ice covers entire pond length and west edge has thicker, wavier 1.5" ice

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1505 Sample Type: Fresh Water - small tundra pond
 Name of Samplers: STG/KHN
 Location ID: SWB Sample ID: FTU3-SWB Photo#: 9
 Coordinates: 70° 10.134 N 146° 15.846 W

Sample Location description (Sketch)



WATER PARAMETERS @ 1500

pH 7.11 Conductivity 0.8624 ^{ms/cm} Turbidity — DO 5.02 Temp 1.2 °C Salinity 0.02%
 Water color and clarity Light yellow tint, clear water
 Pond size (dimensions/approximate depth) 60 x 40 x 8 inches deep

Appearance of bottom sediment and surrounding sediment Bottom sediment consists of black organic rich material with some red rust-color sediments in a few spots - thermokast mat material
 Vegetation present abundant grasses and tundra mat heavily vegetate pond

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life No aquatic life observed

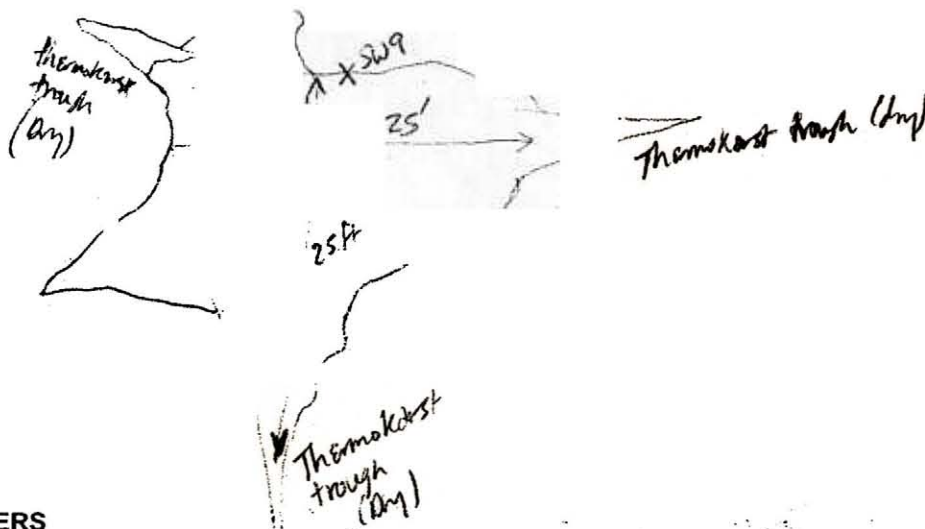
Connection/communication with other water bodies No communication with other water bodies at this time, however thermokast troughs to the NW and SW may allow communication in high water times

Other: Ice covers pond and is 1/2 inch thick

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1530 Sample Type: Fresh water small tundra pond
 Name of Samplers: STS/KHN
 Location ID: SW9 Sample ID: PTU3-SW9 Photo#: 10
 Coordinates: 70° 10.093N 146° 15.920W

Sample Location description (Sketch)



WATER PARAMETERS

pH 6.95 Conductivity 0.370 ^{mc/cm} Turbidity — DO 7.80 ^{mg/L} Temp 1.5 °C Salinity 0.01 ‰
 Water color and clarity clear, yellow tinted water
 Pond size (dimensions/approximate depth) 25 ft x 25 ft x < 8 inches

Appearance of bottom sediment and surrounding sediment organic mat and some red colored sediment present in portions of pond floor. Organic mat is dark brown to black color.

Vegetation present tundra mat and grasses are abundant on the bottom. Grasses surround pond edge.

Odor or sheen present on water surface no odor or sheen observed

Observations of aquatic life no aquatic life observed

Connection/communication with other water bodies no connection with water bodies at this time; however at higher water times communication is possible with other ponds via troughs

Other: ice covers entire pond and is 1/2 inch thick

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02

Sample Time: 1555

Sample Type: Fresh Water - Small tundra pond

Name of Samplers: STS/KHN

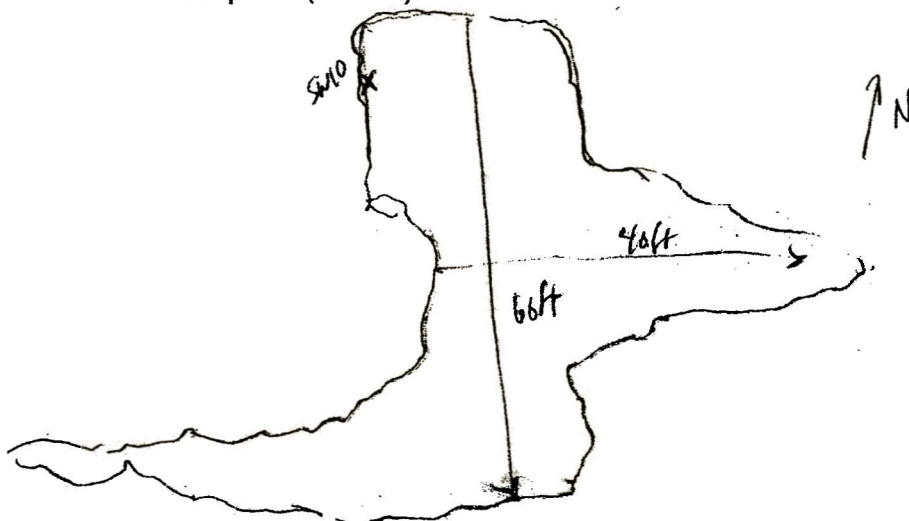
Location ID: SW10

Sample ID: PTU3-SW10

Photo#: 11

Coordinates: 70° 10.095 N 146° 15.919 W

Sample Location description (Sketch)



WATER PARAMETERS

pH 7.04 Conductivity 0.765 Turbidity — DO 0.14 Temp 1.5 °C Salinity 0.03%

Water color and clarity Very light yellow tinted water, some suspended sediment

Pond size (dimensions/approximate depth) 6' x 4' x 6 inches

Appearance of bottom sediment and surrounding sediment Organic mat and grasses/vegetation bottom with a few scattered unvegetated areas in the center portions of pond - some red colored

Vegetation present Organic mat present throughout bottom and some darker colored mat material. Stone mats also.

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life Some small organisms observed in the water

Connection/communication with other water bodies Connection to other ponds via thermohaline trough to SW.

Other: Ice present over surface of pond and range in thickness from 1-1.25 inches

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02

Sample Time: 1635

Sample Type: Brackish water - Estuarine

Name of Samplers: STB/KHN

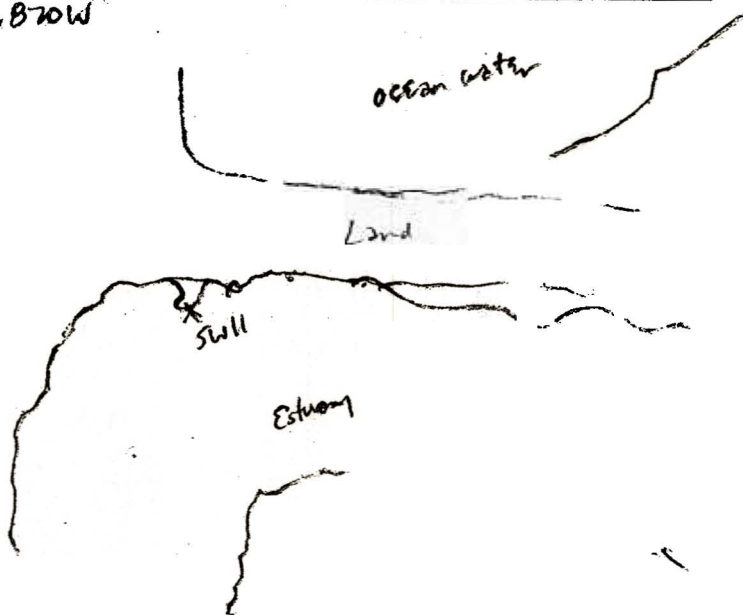
Location ID: SW11

Sample ID: PTU3-SW11

Photo#: 12

Coordinates: 70° 10.033N 146° 15.922W

Sample Location description (Sketch)
70° 10.067N 146° 14.870W



WATER PARAMETERS

pH 7.93 Conductivity 5.61 Turbidity - DO 10.55 Temp 0.6 °C Salinity 0.60 ‰

Water color and clarity Faint yellow tinted water with very minor amounts of organic material suspended.

Pond size (dimensions/approximate depth) > 1600' long x 500' x deep

Appearance of bottom sediment and surrounding sediment Bottom is too murky to assess but edges of water consist of brown to black peat-rich humus mats, some grasses and moss.

Vegetation present Organic humus mat along edges but can't determine vegetation presence in bottom area.

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life aquatic life is abundant at sample location as small tad-pole like organisms (yellow)

Connection/communication with other water bodies Water connects to fresh water bodies to the south & south west and connects to Beaufort Sea to northeast.

Other: Portions of estuary surface water is covered with ice - ice sheets on ground next to sample location but not in water.

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02

Sample Time: 1700

Sample Type: Estuarine water

Name of Samplers: SJS/KHN

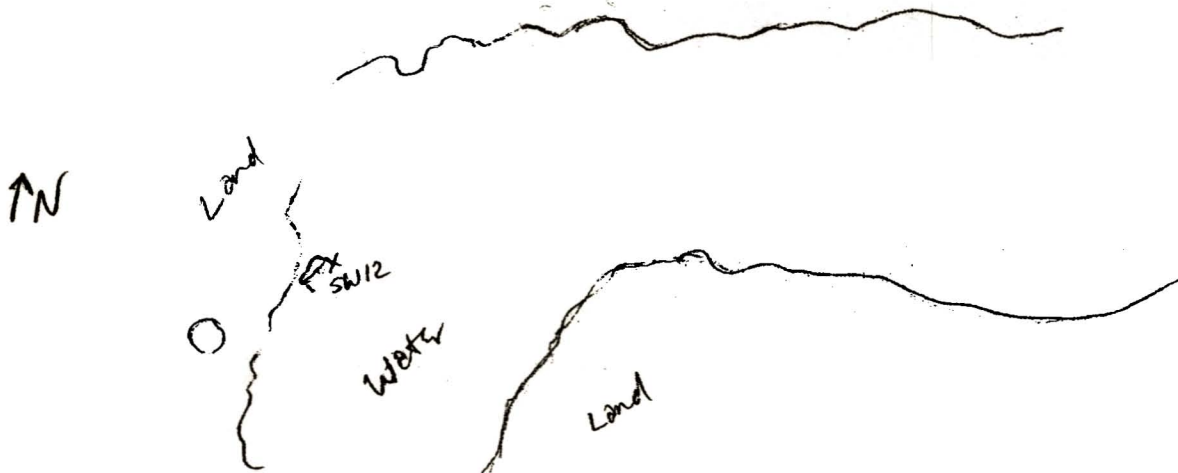
Location ID: SW12

Sample ID: PTU3 SW12

Photo#: 13

Coordinates: 70° 10.023N 146° 15.013W

Sample Location description (Sketch)



WATER PARAMETERS

pH 7.95 Conductivity 3.83 Turbidity — DO 10.27 Temp 0.7 °C Salinity 0.1676

Water color and clarity Clear, colorless

Pond size (dimensions/approximate depth) > 1600' Long x 500' x ? deep

Appearance of bottom sediment and surrounding sediment bottom too muddy to assess but is fine gray mud and silt in and around peat tundra mat shoreline

Vegetation present tundra mat with graminia abundant along shore. can't determine

Odor or sheen present on water surface No odor or sheen present.

Observations of aquatic life Some small organisms present

Connection/communication with other water bodies Water is connected to Beaufort Sea to NIS and fresh water bodies to south & SW

Other: Ice is present along center area of estuary but not along edges

2002 XOM NPDES SURFACE WATER SAMPLING EVENT

Sample Date: 9/27/02 Sample Time: 1725 Sample Type: Freshwater
 Name of Samplers: STS/KHN
 Location ID: SW13 Sample ID: PTU3-13 Photo#: 14
 Coordinates: 70° 10.072N 146° 15.532W
 Sample Location description (Sketch)



WATER PARAMETERS

pH 8.24 Conductivity 0.97 Turbidity — DO 11.83 Temp 0.9 °C Salinity 0.03‰

Water color and clarity faint yellow colored water, clear

Pond size (dimensions/approximate depth) 1000' x 800' x > 5 feet deep - lake is ~ 1 foot deep at sample location (1/8 inch to 1 inch in diameter underlain by silt)

Appearance of bottom sediment and surrounding sediment sediment at sample location is predominantly coarse gravel with 1/8 inch

Vegetation present No vegetation visible at sample location in lake but tundra mat and moss and grasses are abundant on shoreline.

Odor or sheen present on water surface No odor or sheen present

Observations of aquatic life Some small black and red organisms visible in the water

Connection/communication with other water bodies Lake may drain out to Estuary at its SE corner based on aerial photos

Other: ICE covers almost the entire pond except portions of the very edge. The sampling location is free of ice but is surrounded by 1/4 to 1/2 inch of ice on the surface.

**Attachment C
Data Tables**

Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Volatile, Semivolatile, and Physical Parameter Results

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW1	Marine	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW1	Marine	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW1	Marine	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW1	Marine	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW1	Marine	EPA 160.2	Total Suspended Solids	8	1,050	mg/L		NAWQC
PTU3-SW1	Marine	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW1	Marine	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW1	Marine	EPA 410.4	Chemical Oxygen Demand	400	1,290	mg/L		NAWQC
PTU3-SW1	Marine	EPA 415.1	Total Organic Carbon	0.5	2.42	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW1	Marine	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW1	Marine	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW1	Marine	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW1	Marine	SW8270 SIM	Acenaphthene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Acenaphthylene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Anthracene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Benzo(a)Anthracene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Benzo[a]pyrene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Benzo[b]Fluoranthene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Benzo[g,h,i]perylene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Chrysene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Dibenzo[a,h]anthracene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Fluoranthene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Fluorene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Naphthalene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Phenanthrene	0.105	ND	µg/L		NAWQC
PTU3-SW1	Marine	SW8270 SIM	Pyrene	0.105	ND	µg/L		NAWQC
PTU3-SW2	Marine	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW2	Marine	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW2	Marine	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW2	Marine	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW2	Marine	EPA 160.2	Total Suspended Solids	4	88	mg/L		NAWQC
PTU3-SW2	Marine	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW2	Marine	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW2	Marine	EPA 410.4	Chemical Oxygen Demand	400	1,250	mg/L		NAWQC
PTU3-SW2	Marine	EPA 415.1	Total Organic Carbon	0.5	1.41	mg/L		NAWQC

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PTU3-SW2	Marine	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW2	Marine	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW2	Marine	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW2	Marine	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW2	Marine	SW8270 SIM	Acenaphthene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Acenaphthylene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Anthracene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Benzo(a)Anthracene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Benzo[a]pyrene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Benzo[b]Fluoranthene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Benzo[g,h,i]perylene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Chrysene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Dibenzo[a,h]anthracene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Fluoranthene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Fluorene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Naphthalene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Phenanthrene	0.11	ND	µg/L		NAWQC
PTU3-SW2	Marine	SW8270 SIM	Pyrene	0.11	ND	µg/L		NAWQC
PTU3-SW3	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW3	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW3	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW3	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW3	Fresh	EPA 160.2	Total Suspended Solids	4	14	mg/L		NAWQC
PTU3-SW3	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW3	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	6.2	mg/L		NAWQC
PTU3-SW3	Fresh	EPA 410.4	Chemical Oxygen Demand	20	99.7	mg/L		NAWQC
PTU3-SW3	Fresh	EPA 415.1	Total Organic Carbon	0.5	30.6	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW3	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW3	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW3	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC

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Volatile, Semivolatile, and Physical Parameter Results

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PTU3-SW3	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW3	Fresh	SW8270 SIM	Acenaphthene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Acenaphthylene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Anthracene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Benzo[a]pyrene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Chrysene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Fluoranthene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Fluorene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Naphthalene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Phenanthrene	0.1	ND	µg/L		NAWQC
PTU3-SW3	Fresh	SW8270 SIM	Pyrene	0.1	ND	µg/L		NAWQC
PTU3-SW4	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW4	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW4	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW4	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW4	Fresh	EPA 160.2	Total Suspended Solids	4	14	mg/L		NAWQC
PTU3-SW4	Fresh	EPA 350.2	Ammonia-N	0.2	0.23	mg/L		NAWQC
PTU3-SW4	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	2.3	mg/L		NAWQC
PTU3-SW4	Fresh	EPA 410.4	Chemical Oxygen Demand	20	82.2	mg/L		NAWQC
PTU3-SW4	Fresh	EPA 415.1	Total Organic Carbon	0.5	22.4	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW4	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW4	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW4	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW4	Fresh	SW8270 SIM	Acenaphthene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Acenaphthylene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Chrysene	0.0935	ND	µg/L		NAWQC

Point Thomson Gas Cycling Project
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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW4	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Fluorene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Naphthalene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Phenanthrene	0.0935	ND	µg/L		NAWQC
PTU3-SW4	Fresh	SW8270 SIM	Pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW5	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW5	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW5	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW5	Fresh	EPA 160.2	Total Suspended Solids	2	3	mg/L		NAWQC
PTU3-SW5	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW5	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW5	Fresh	EPA 410.4	Chemical Oxygen Demand	20	27.4	mg/L		NAWQC
PTU3-SW5	Fresh	EPA 415.1	Total Organic Carbon	0.5	8.8	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW5	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW5	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW5	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW5	Fresh	SW8270 SIM	Acenaphthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Acenaphthylene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Chrysene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Fluorene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Naphthalene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Phenanthrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5	Fresh	SW8270 SIM	Pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW5 dup	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²

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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW5 dup	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW5 dup	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW5 dup	Fresh	EPA 160.2	Total Suspended Solids	2	2	mg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 410.4	Chemical Oxygen Demand	20	40.5	mg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 415.1	Total Organic Carbon	0.5	9.37	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW5 dup	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW5 dup	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW5 dup	Fresh	SW8270 SIM	Acenaphthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Acenaphthylene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Chrysene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Fluorene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Naphthalene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Phenanthrene	0.0935	ND	µg/L		NAWQC
PTU3-SW5 dup	Fresh	SW8270 SIM	Pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW6	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW6	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW6	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW6	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW6	Fresh	EPA 160.2	Total Suspended Solids	2	18	mg/L		NAWQC
PTU3-SW6	Fresh	EPA 350.2	Ammonia-N	0.2	0.48	mg/L		NAWQC
PTU3-SW6	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW6	Fresh	EPA 410.4	Chemical Oxygen Demand	20	77.8	mg/L		NAWQC
PTU3-SW6	Fresh	EPA 415.1	Total Organic Carbon	0.5	20.3	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC

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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW6	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW6	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW6	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW6	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW6	Fresh	SW8270 SIM	Acenaphthene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Acenaphthylene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Anthracene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Chrysene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Fluoranthene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Fluorene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Naphthalene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Phenanthrene	0.0962	ND	µg/L		NAWQC
PTU3-SW6	Fresh	SW8270 SIM	Pyrene	0.0962	ND	µg/L		NAWQC
PTU3-SW7	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW7	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW7	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW7	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW7	Fresh	EPA 160.2	Total Suspended Solids	2	2	mg/L		NAWQC
PTU3-SW7	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW7	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	2.1	mg/L		NAWQC
PTU3-SW7	Fresh	EPA 410.4	Chemical Oxygen Demand	20	53.7	mg/L		NAWQC
PTU3-SW7	Fresh	EPA 415.1	Total Organic Carbon	0.5	17.0	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW7	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW7	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW7	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW7	Fresh	SW8270 SIM	Acenaphthene	0.0943	ND	µg/L		NAWQC

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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW7	Fresh	SW8270 SIM	Acenaphthylene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Chrysene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Fluoranthene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Fluorene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Naphthalene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Phenanthrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7	Fresh	SW8270 SIM	Pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW7 dup	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW7 dup	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW7 dup	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW7 dup	Fresh	EPA 160.2	Total Suspended Solids	2	4	mg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 410.4	Chemical Oxygen Demand	20	51.5	mg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 415.1	Total Organic Carbon	0.5	17.5	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW7 dup	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW7 dup	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW7 dup	Fresh	SW8270 SIM	Acenaphthene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Acenaphthylene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Chrysene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Fluoranthene	0.0943	ND	µg/L		NAWQC

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NPDES Surface Water Sampling Event, 9-27-02
Volatile, Semivolatile, and Physical Parameter Results

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW7 dup	Fresh	SW8270 SIM	Fluorene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Naphthalene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Phenanthrene	0.0943	ND	µg/L		NAWQC
PTU3-SW7 dup	Fresh	SW8270 SIM	Pyrene	0.0943	ND	µg/L		NAWQC
PTU3-SW8	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW8	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW8	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW8	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW8	Fresh	EPA 160.2	Total Suspended Solids	4	10	mg/L		NAWQC
PTU3-SW8	Fresh	EPA 350.2	Ammonia-N	0.2	0.29	mg/L		NAWQC
PTU3-SW8	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	2.4	mg/L		NAWQC
PTU3-SW8	Fresh	EPA 410.4	Chemical Oxygen Demand	20	111	mg/L		NAWQC
PTU3-SW8	Fresh	EPA 415.1	Total Organic Carbon	0.5	34.6	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW8	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW8	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW8	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW8	Fresh	SW8270 SIM	Acenaphthene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Acenaphthylene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Anthracene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Chrysene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Fluoranthene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Fluorene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Naphthalene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Phenanthrene	0.0971	ND	µg/L		NAWQC
PTU3-SW8	Fresh	SW8270 SIM	Pyrene	0.0971	ND	µg/L		NAWQC
PTU3-SW9	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW9	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW9	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW9	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹

Point Thomson Gas Cycling Project
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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW9	Fresh	EPA 160.2	Total Suspended Solids	2	4	mg/L		NAWQC
PTU3-SW9	Fresh	EPA 350.2	Ammonia-N	0.2	0.31	mg/L		NAWQC
PTU3-SW9	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW9	Fresh	EPA 410.4	Chemical Oxygen Demand	20	124	mg/L		NAWQC
PTU3-SW9	Fresh	EPA 415.1	Total Organic Carbon	0.5	33.4	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW9	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW9	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW9	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW9	Fresh	SW8270 SIM	Acenaphthene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Acenaphthylene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Chrysene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Fluoranthene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Fluorene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Naphthalene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Phenanthrene	0.0935	ND	µg/L		NAWQC
PTU3-SW9	Fresh	SW8270 SIM	Pyrene	0.0935	ND	µg/L		NAWQC
PTU3-SW10	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW10	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW10	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW10	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW10	Fresh	EPA 160.2	Total Suspended Solids	2	5	mg/L		NAWQC
PTU3-SW10	Fresh	EPA 350.2	Ammonia-N	0.2	0.22	mg/L		NAWQC
PTU3-SW10	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	2.4	mg/L		NAWQC
PTU3-SW10	Fresh	EPA 410.4	Chemical Oxygen Demand	20	73.4	mg/L		NAWQC
PTU3-SW10	Fresh	EPA 415.1	Total Organic Carbon	0.5	24.6	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³

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PTU3-SW10	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW10	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW10	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW10	Fresh	SW8270 SIM	Acenaphthene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Acenaphthylene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Anthracene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Chrysene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Fluoranthene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Fluorene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Naphthalene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Phenanthrene	0.0952	ND	µg/L		NAWQC
PTU3-SW10	Fresh	SW8270 SIM	Pyrene	0.0952	ND	µg/L		NAWQC
PTU3-SW11	Brackish	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW11	Brackish	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW11	Brackish	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW11	Brackish	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW11	Brackish	EPA 160.2	Total Suspended Solids	2	4	mg/L		NAWQC
PTU3-SW11	Brackish	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW11	Brackish	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW11	Brackish	EPA 410.4	Chemical Oxygen Demand	20	93.2	mg/L		NAWQC
PTU3-SW11	Brackish	EPA 415.1	Total Organic Carbon	0.5	9.24	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW11	Brackish	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW11	Brackish	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW11	Brackish	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW11	Brackish	SW8270 SIM	Acenaphthene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Acenaphthylene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Anthracene	0.099	ND	µg/L		NAWQC

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Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW11	Brackish	SW8270 SIM	Benzo(a)Anthracene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Benzo[a]pyrene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Benzo[b]Fluoranthene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Benzo[g,h,i]perylene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Chrysene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Dibenzo[a,h]anthracene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Fluoranthene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Fluorene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Naphthalene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Phenanthrene	0.099	ND	µg/L		NAWQC
PTU3-SW11	Brackish	SW8270 SIM	Pyrene	0.099	ND	µg/L		NAWQC
PTU3-SW12	Brackish	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW12	Brackish	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW12	Brackish	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW12	Brackish	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW12	Brackish	EPA 160.2	Total Suspended Solids	4	18	mg/L		NAWQC
PTU3-SW12	Brackish	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW12	Brackish	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW12	Brackish	EPA 410.4	Chemical Oxygen Demand	20	176	mg/L		NAWQC
PTU3-SW12	Brackish	EPA 415.1	Total Organic Carbon	0.5	8.24	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW12	Brackish	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW12	Brackish	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW12	Brackish	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW12	Brackish	SW8270 SIM	Acenaphthene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Acenaphthylene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Benzo(a)Anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Benzo[a]pyrene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Benzo[b]Fluoranthene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Benzo[g,h,i]perylene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Chrysene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Dibenzo[a,h]anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Fluoranthene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Fluorene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0926	ND	µg/L		NAWQC

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PTU3-SW12	Brackish	SW8270 SIM	Naphthalene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Phenanthrene	0.0926	ND	µg/L		NAWQC
PTU3-SW12	Brackish	SW8270 SIM	Pyrene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	Calculation	TAH	n/a	ND	µg/L		10 ¹
PTU3-SW13	Fresh	Calculation	TAqH	n/a	ND	µg/L		15 ²
PTU3-SW13	Fresh	Calculation	Total BTEX	n/a	ND	mg/L		0.01 ¹
PTU3-SW13	Fresh	Calculation	Total Xylene	n/a	ND	mg/L		0.01 ¹
PTU3-SW13	Fresh	EPA 160.2	Total Suspended Solids	2	2	mg/L		NAWQC
PTU3-SW13	Fresh	EPA 350.2	Ammonia-N	0.2	ND	mg/L		NAWQC
PTU3-SW13	Fresh	EPA 405.1	Biochemical Oxygen Demand	2	ND	mg/L		NAWQC
PTU3-SW13	Fresh	EPA 410.4	Chemical Oxygen Demand	20	44.9	mg/L		NAWQC
PTU3-SW13	Fresh	EPA 415.1	Total Organic Carbon	0.5	9.54	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	Benzene	0.0005	ND	mg/L		0.005 ³
PTU3-SW13	Fresh	SW8260B	Chlorobenzene	0.001	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	Ethylbenzene	0.001	ND	mg/L		0.01 ¹
PTU3-SW13	Fresh	SW8260B	Naphthalene	0.002	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	o-Xylene	0.001	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	P & M -Xylene	0.002	ND	mg/L		NAWQC
PTU3-SW13	Fresh	SW8260B	Toluene	0.001	ND	mg/L		0.01 ¹
PTU3-SW13	Fresh	SW8270 SIM	Acenaphthene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Acenaphthylene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Benzo(a)Anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Benzo[a]pyrene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Benzo[b]Fluoranthene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Benzo[g,h,i]perylene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Chrysene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Dibenzo[a,h]anthracene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Fluoranthene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Fluorene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Naphthalene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Phenanthrene	0.0926	ND	µg/L		NAWQC
PTU3-SW13	Fresh	SW8270 SIM	Pyrene	0.0926	ND	µg/L		NAWQC
Trip Blank	n/a	SW8260B	1,2-Dichlorobenzene	0.001	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	1,3-Dichlorobenzene	0.001	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	1,4-Dichlorobenzene	0.001	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	Benzene	0.0005	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	Chlorobenzene	0.001	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	Ethylbenzene	0.001	ND	mg/L		n/a

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Volatile, Semivolatile, and Physical Parameter Results**

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
Trip Blank	n/a	SW8260B	Naphthalene	0.002	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	o-Xylene	0.001	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	P & M -Xylene	0.002	ND	mg/L		n/a
Trip Blank	n/a	SW8260B	Toluene	0.001	ND	mg/L		n/a

¹ Standard was obtained from ADEC Surface Water Quality Standards (18 AAC 70.020)

² Standard was obtained from ADEC Surface Water Quality Standards (18 AAC 70)

³ Standard was obtained from ADEC Drinking Water Standards (18 AAC 80)

AAC - Alaska Administrative Code

ADEC - Alaska Department of Environmental Conservation

mg/L - milligrams per liter

µg/L - micrograms per liter

n/a - Not applicable

NAWQC - No applicable water quality criteria

ND - Not detected

TAH - Total Aromatic Hydrocarbons

TAQH - Total Aqueous Hydrocarbons

Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Inorganic Analytical Results

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW1	Marine	EPA 206.2	Arsenic, Total	10	ND	µg/L		36 ¹
PTU3-SW1	Marine	EPA 200.7	Barium, Total	5	744	µg/L	N	2,000 ²
PTU3-SW1	Marine	EPA 200.7	Calcium, Total	5,000	352,000	µg/L		NAWQC
PTU3-SW1	Marine	EPA 200.7	Chromium, Total	5	9.4	µg/L		100 ³
PTU3-SW1	Marine	EPA 200.8	Lead, Total	0.4	9.58	µg/L		5.6 ⁴
PTU3-SW1	Marine	EPA 200.7	Magnesium, Total	2,000	1,020,000	µg/L		NAWQC
PTU3-SW1	Marine	EPA 200.7	Nickel, Total	20	ND	µg/L	N	8.3 ³
PTU3-SW1	Marine	EPA 200.7	Sodium, Total	10,000	8,200,000	µg/L		NAWQC
PTU3-SW1	Marine	EPA 200.7	Zinc, Total	10	27.7	µg/L		86 ⁴
PTU3-SW2	Marine	EPA 206.2	Arsenic, Total	10	ND	µg/L		36 ¹
PTU3-SW2	Marine	EPA 200.7	Barium, Total	5	70.3	µg/L	N	2,000 ²
PTU3-SW2	Marine	EPA 200.7	Calcium, Total	5,000	342,000	µg/L		NAWQC
PTU3-SW2	Marine	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW2	Marine	EPA 200.8	Lead, Total	0.4	6.9	µg/L		5.6 ⁴
PTU3-SW2	Marine	EPA 200.7	Magnesium, Total	2,000	1,010,000	µg/L		NAWQC
PTU3-SW2	Marine	EPA 200.7	Nickel, Total	20	ND	µg/L	N	8.3 ³
PTU3-SW2	Marine	EPA 200.7	Sodium, Total	10,000	8,200,000	µg/L		NAWQC
PTU3-SW2	Marine	EPA 200.7	Zinc, Total	10	18.7	µg/L		86 ⁴
PTU3-SW3	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW3	Fresh	EPA 200.7	Barium, Total	5	47.1	µg/L	N	2,000 ²
PTU3-SW3	Fresh	EPA 200.7	Calcium, Total	50	56,200	µg/L		NAWQC
PTU3-SW3	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW3	Fresh	EPA 200.8	Lead, Total	0.02	0.147	µg/L		8.3 ⁴
PTU3-SW3	Fresh	EPA 200.7	Magnesium, Total	20	17,300	µg/L		NAWQC
PTU3-SW3	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW3	Fresh	EPA 200.7	Sodium, Total	100	70,600	µg/L		250,000 ⁴
PTU3-SW3	Fresh	EPA 200.7	Zinc, Total	10	17.9	µg/L		200 ⁴
PTU3-SW4	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW4	Fresh	EPA 200.7	Barium, Total	5	48.0	µg/L	N	2,000 ²
PTU3-SW4	Fresh	EPA 200.7	Calcium, Total	50	63,900	µg/L		NAWQC
PTU3-SW4	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW4	Fresh	EPA 200.8	Lead, Total	0.02	0.161	µg/L		8.5 ⁴
PTU3-SW4	Fresh	EPA 200.7	Magnesium, Total	20	13,700	µg/L		NAWQC
PTU3-SW4	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW4	Fresh	EPA 200.7	Sodium, Total	100	41,800	µg/L		250,000 ⁴
PTU3-SW4	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		203 ⁴
PTU3-SW5	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW5	Fresh	EPA 200.7	Barium, Total	5	30.0	µg/L	N	2,000 ²
PTU3-SW5	Fresh	EPA 200.7	Calcium, Total	50	42,200	µg/L		NAWQC
PTU3-SW5	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW5	Fresh	EPA 200.8	Lead, Total	0.02	0.290	µg/L		5.9 ⁴

Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Inorganic Analytical Results

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW5	Fresh	EPA 200.7	Magnesium, Total	20	13,700	µg/L		NAWQC
PTU3-SW5	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW5	Fresh	EPA 200.7	Sodium, Total	100	89,600	µg/L		250,000 ⁴
PTU3-SW5	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		159 ⁴
PTU3-SW5 dup	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW5 dup	Fresh	EPA 200.7	Barium, Total	5	37.9	µg/L	N	2,000 ²
PTU3-SW5 dup	Fresh	EPA 200.7	Calcium, Total	50	49,400	µg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW5 dup	Fresh	EPA 200.8	Lead, Total	0.02	0.181	µg/L		7.2 ⁴
PTU3-SW5 dup	Fresh	EPA 200.7	Magnesium, Total	20	15,800	µg/L		NAWQC
PTU3-SW5 dup	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW5 dup	Fresh	EPA 200.7	Sodium, Total	100	100,000	µg/L		250,000 ⁴
PTU3-SW5 dup	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		181 ⁴
PTU3-SW6	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW6	Fresh	EPA 200.7	Barium, Total	5	28.4	µg/L	N	2,000 ²
PTU3-SW6	Fresh	EPA 200.7	Calcium, Total	50	33,500	µg/L		NAWQC
PTU3-SW6	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW6	Fresh	EPA 200.8	Lead, Total	0.02	0.237	µg/L		4.7 ⁴
PTU3-SW6	Fresh	EPA 200.7	Magnesium, Total	20	12,200	µg/L		NAWQC
PTU3-SW6	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW6	Fresh	EPA 200.7	Sodium, Total	100	69,100	µg/L		250,000 ⁴
PTU3-SW6	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		136 ⁴
PTU3-SW7	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW7	Fresh	EPA 200.7	Barium, Total	5	31.4	µg/L	N	2,000 ²
PTU3-SW7	Fresh	EPA 200.7	Calcium, Total	50	42,500	µg/L		NAWQC
PTU3-SW7	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW7	Fresh	EPA 200.8	Lead, Total	0.02	0.169	µg/L		5.3 ⁴
PTU3-SW7	Fresh	EPA 200.7	Magnesium, Total	20	10,300	µg/L		NAWQC
PTU3-SW7	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW7	Fresh	EPA 200.7	Sodium, Total	100	47,600	µg/L		250,000 ⁴
PTU3-SW7	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		148 ⁴
PTU3-SW7 dup	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW7 dup	Fresh	EPA 200.7	Barium, Total	5	33.3	µg/L	N	2,000 ²
PTU3-SW7 dup	Fresh	EPA 200.7	Calcium, Total	50	43,800	µg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW7 dup	Fresh	EPA 200.8	Lead, Total	0.02	0.161	µg/L		5.5 ⁴
PTU3-SW7 dup	Fresh	EPA 200.7	Magnesium, Total	20	10,600	µg/L		NAWQC
PTU3-SW7 dup	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW7 dup	Fresh	EPA 200.7	Sodium, Total	100	49,500	µg/L		250,000 ⁴
PTU3-SW7 dup	Fresh	EPA 200.7	Zinc, Total	10	12.6	µg/L		152 ⁴
PTU3-SW8	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³

Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Inorganic Analytical Results

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW8	Fresh	EPA 200.7	Barium, Total	5	47.6	µg/L	N	2,000 ²
PTU3-SW8	Fresh	EPA 200.7	Calcium, Total	50	66,200	µg/L		NAWQC
PTU3-SW8	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW8	Fresh	EPA 200.8	Lead, Total	0.02	0.117	µg/L		9.4 ⁴
PTU3-SW8	Fresh	EPA 200.7	Magnesium, Total	20	16,700	µg/L		NAWQC
PTU3-SW8	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW8	Fresh	EPA 200.7	Sodium, Total	100	55,900	µg/L		250,000 ⁴
PTU3-SW8	Fresh	EPA 200.7	Zinc, Total	10	37.2	µg/L		218 ⁴
PTU3-SW9	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW9	Fresh	EPA 200.7	Barium, Total	5	20.0	µg/L	N	2,000 ²
PTU3-SW9	Fresh	EPA 200.7	Calcium, Total	50	33,800	µg/L		NAWQC
PTU3-SW9	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW9	Fresh	EPA 200.8	Lead, Total	0.02	0.139	µg/L		4.2 ⁴
PTU3-SW9	Fresh	EPA 200.7	Magnesium, Total	20	9,570	µg/L		NAWQC
PTU3-SW9	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW9	Fresh	EPA 200.7	Sodium, Total	100	32,700	µg/L		250,000 ⁴
PTU3-SW9	Fresh	EPA 200.7	Zinc, Total	10	14.9	µg/L		127 ⁴
PTU3-SW10	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW10	Fresh	EPA 200.7	Barium, Total	5	56.0	µg/L	N	2,000 ²
PTU3-SW10	Fresh	EPA 200.7	Calcium, Total	50	80,400	µg/L		NAWQC
PTU3-SW10	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW10	Fresh	EPA 200.8	Lead, Total	0.02	0.162	µg/L		11.6 ⁴
PTU3-SW10	Fresh	EPA 200.7	Magnesium, Total	20	18,200	µg/L		NAWQC
PTU3-SW10	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW10	Fresh	EPA 200.7	Sodium, Total	100	64,200	µg/L		250,000 ⁴
PTU3-SW10	Fresh	EPA 200.7	Zinc, Total	10	ND	µg/L		250 ⁴
PTU3-SW11	Brackish	EPA 206.2	Arsenic, Total	10	ND	µg/L		36 ¹
PTU3-SW11	Brackish	EPA 200.7	Barium, Total	5	22.4	µg/L	N	2,000 ²
PTU3-SW11	Brackish	EPA 200.7	Calcium, Total	50	46,600	µg/L		NAWQC
PTU3-SW11	Brackish	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW11	Brackish	EPA 200.8	Lead, Total	0.02	0.124	µg/L		5.6 ⁴
PTU3-SW11	Brackish	EPA 200.7	Magnesium, Total	20	24,500	µg/L		NAWQC
PTU3-SW11	Brackish	EPA 200.7	Nickel, Total	20	ND	µg/L	N	8.3 ³
PTU3-SW11	Brackish	EPA 200.7	Sodium, Total	5,000	185,000	µg/L		NAWQC
PTU3-SW11	Brackish	EPA 200.7	Zinc, Total	10	ND	µg/L		86 ⁴
PTU3-SW12	Brackish	EPA 206.2	Arsenic, Total	10	ND	µg/L		36 ¹
PTU3-SW12	Brackish	EPA 200.7	Barium, Total	5	20.4	µg/L	N	2,000 ²
PTU3-SW12	Brackish	EPA 200.7	Calcium, Total	50	84,000	µg/L		NAWQC
PTU3-SW12	Brackish	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW12	Brackish	EPA 200.8	Lead, Total	0.1	0.795	µg/L		5.6 ⁴
PTU3-SW12	Brackish	EPA 200.7	Magnesium, Total	20	172,000	µg/L		NAWQC

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Inorganic Analytical Results**

Field Sample ID	Water Sample Type	Method	Analyte	MRL	Result	Units	Result Notes	Applicable Water Quality Criteria
PTU3-SW12	Brackish	EPA 200.7	Nickel, Total	20	ND	µg/L	N	8.3 ³
PTU3-SW12	Brackish	EPA 200.7	Sodium, Total	5,000	1,390,000	µg/L		NAWQC
PTU3-SW12	Brackish	EPA 200.7	Zinc, Total	10	ND	µg/L		86 ⁴
PTU3-SW13	Fresh	EPA 206.2	Arsenic, Total	10	ND	µg/L		50 ³
PTU3-SW13	Fresh	EPA 200.7	Barium, Total	5	34.3	µg/L	N	2,000 ²
PTU3-SW13	Fresh	EPA 200.7	Calcium, Total	50	50,200	µg/L		NAWQC
PTU3-SW13	Fresh	EPA 200.7	Chromium, Total	5	ND	µg/L		100 ³
PTU3-SW13	Fresh	EPA 200.8	Lead, Total	0.02	0.162	µg/L		7.3 ⁴
PTU3-SW13	Fresh	EPA 200.7	Magnesium, Total	20	16,000	µg/L		NAWQC
PTU3-SW13	Fresh	EPA 200.7	Nickel, Total	20	ND	µg/L	N	100 ³
PTU3-SW13	Fresh	EPA 200.7	Sodium, Total	100	101,000	µg/L		250,000 ⁴
PTU3-SW13	Fresh	EPA 200.7	Zinc, Total	10	22.8	µg/L		183 ⁴

¹ Standard was obtained from USEPA Ambient Water Quality Criteria for Arsenic

² Standard was obtained from ADEC Surface Water Quality and Drinking Water Standards (18 AAC 70 and 18 AAC 80)

³ Standard was obtained from ADEC Drinking Water Standards (18 AAC 80)

⁴ Standard was obtained from ADEC Surface Water Quality Standards (18 AAC 70)

AAC - Alaska Administrative Code

ADEC - Alaska Department of Environmental Conservation

mg/L - milligrams per liter

µg/L - micrograms per liter

N - possible low bias

NAWQC - No applicable water quality criteria

ND - Not detected

USEPA - United States Environmental Protection Agency

Point Thomson Gas Cycling Project
NPDES Surface Water Sampling, 9-27-02
Field Parameters

Field Sample ID	Water Sample Type	Method	Analyte	Result	Units	Applicable Water Quality Criteria
PTU3-SW1	Marine	Field Test	Conductivity	45.8	mS/cm	NAWQC
PTU3-SW1	Marine	Field Test	DO	10.37	mg/L	NAWQC
PTU3-SW1	Marine	Field Test	pH	7.94	pH Units	6.5-8.5 ¹
PTU3-SW1	Marine	Field Test	Salinity	2.71	percent	NAWQC
PTU3-SW1	Marine	Field Test	Salinity	27.1	ppt	NAWQC
PTU3-SW1	Marine	Field Test	Temperature	0.3	degrees C	NAWQC
PTU3-SW2	Marine	Field Test	Conductivity	46.1	mS/cm	NAWQC
PTU3-SW2	Marine	Field Test	DO	10.67	mg/L	NAWQC
PTU3-SW2	Marine	Field Test	pH	7.94	pH Units	6.5-8.5 ¹
PTU3-SW2	Marine	Field Test	Salinity	2.73	percent	NAWQC
PTU3-SW2	Marine	Field Test	Salinity	27.3	ppt	NAWQC
PTU3-SW2	Marine	Field Test	Temperature	0.1	degrees C	NAWQC
PTU3-SW3	Fresh	Field Test	Conductivity	1.01	mS/cm	NAWQC
PTU3-SW3	Fresh	Field Test	DO	13.27	mg/L	NAWQC
PTU3-SW3	Fresh	Field Test	pH	6.88	pH Units	6.5-8.5 ¹
PTU3-SW3	Fresh	Field Test	Salinity	0.03	percent	NAWQC
PTU3-SW3	Fresh	Field Test	Salinity	0.3	ppt	NAWQC
PTU3-SW3	Fresh	Field Test	Temperature	0.3	degrees C	NAWQC
PTU3-SW4	Fresh	Field Test	Conductivity	0.543	mS/cm	NAWQC
PTU3-SW4	Fresh	Field Test	DO	2.14	mg/L	NAWQC
PTU3-SW4	Fresh	Field Test	pH	6.81	pH Units	6.5-8.5 ¹
PTU3-SW4	Fresh	Field Test	Salinity	0.02	percent	NAWQC
PTU3-SW4	Fresh	Field Test	Salinity	0.2	ppt	NAWQC
PTU3-SW4	Fresh	Field Test	Temperature	0.5	degrees C	NAWQC
PTU3-SW5	Fresh	Field Test	Conductivity	0.865	mS/cm	NAWQC
PTU3-SW5	Fresh	Field Test	DO	12.11	mg/L	NAWQC
PTU3-SW5	Fresh	Field Test	pH	8.17	pH Units	6.5-8.5 ¹
PTU3-SW5	Fresh	Field Test	Salinity	0.03	percent	NAWQC
PTU3-SW5	Fresh	Field Test	Salinity	0.3	ppt	NAWQC
PTU3-SW5	Fresh	Field Test	Temperature	0.4	degrees C	NAWQC
PTU3-SW6	Fresh	Field Test	Conductivity	0.58	mS/cm	NAWQC
PTU3-SW6	Fresh	Field Test	DO	10.42	mg/L	NAWQC
PTU3-SW6	Fresh	Field Test	pH	7.6	pH Units	6.5-8.5 ¹
PTU3-SW6	Fresh	Field Test	Salinity	0.02	percent	NAWQC
PTU3-SW6	Fresh	Field Test	Salinity	0.2	ppt	NAWQC
PTU3-SW6	Fresh	Field Test	Temperature	1.1	degrees C	NAWQC
PTU3-SW7	Fresh	Field Test	Conductivity	0.488	mS/cm	NAWQC
PTU3-SW7	Fresh	Field Test	DO	12.16	mg/L	NAWQC
PTU3-SW7	Fresh	Field Test	pH	8.13	pH Units	6.5-8.5 ¹
PTU3-SW7	Fresh	Field Test	Salinity	0	percent	NAWQC
PTU3-SW7	Fresh	Field Test	Salinity	0	ppt	NAWQC
PTU3-SW7	Fresh	Field Test	Temperature	0.9	degrees C	NAWQC
PTU3-SW8	Fresh	Field Test	Conductivity	0.624	mS/cm	NAWQC
PTU3-SW8	Fresh	Field Test	DO	5.02	mg/L	NAWQC
PTU3-SW8	Fresh	Field Test	pH	7.11	pH Units	6.5-8.5 ¹
PTU3-SW8	Fresh	Field Test	Salinity	0.02	percent	NAWQC

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling, 9-27-02
Field Parameters**

Field Sample ID	Water Sample Type	Method	Analyte	Result	Units	Applicable Water Quality Criteria
PTU3-SW8	Fresh	Field Test	Salinity	0.2	ppt	NAWQC
PTU3-SW8	Fresh	Field Test	Temperature	1.2	degrees C	NAWQC
PTU3-SW9	Fresh	Field Test	Conductivity	0.37	mS/cm	NAWQC
PTU3-SW9	Fresh	Field Test	DO	7.8	mg/L	NAWQC
PTU3-SW9	Fresh	Field Test	pH	6.95	pH Units	6.5-8.5 ¹
PTU3-SW9	Fresh	Field Test	Salinity	0.01	percent	NAWQC
PTU3-SW9	Fresh	Field Test	Salinity	0.1	ppt	NAWQC
PTU3-SW9	Fresh	Field Test	Temperature	1.5	degrees C	NAWQC
PTU3-SW10	Fresh	Field Test	Conductivity	0.765	mS/cm	NAWQC
PTU3-SW10	Fresh	Field Test	DO	0.14	mg/L	NAWQC
PTU3-SW10	Fresh	Field Test	pH	7.04	pH Units	6.5-8.5 ¹
PTU3-SW10	Fresh	Field Test	Salinity	0.03	percent	NAWQC
PTU3-SW10	Fresh	Field Test	Salinity	0.3	ppt	NAWQC
PTU3-SW10	Fresh	Field Test	Temperature	1.5	degrees C	NAWQC
PTU3-SW11	Brackish	Field Test	Conductivity	5.61	mS/cm	NAWQC
PTU3-SW11	Brackish	Field Test	DO	10.55	mg/L	NAWQC
PTU3-SW11	Brackish	Field Test	pH	7.93	pH Units	6.5-8.5 ¹
PTU3-SW11	Brackish	Field Test	Salinity	0.6	percent	NAWQC
PTU3-SW11	Brackish	Field Test	Salinity	6	ppt	NAWQC
PTU3-SW11	Brackish	Field Test	Temperature	0.6	degrees C	NAWQC
PTU3-SW12	Brackish	Field Test	Conductivity	3.83	mS/cm	NAWQC
PTU3-SW12	Brackish	Field Test	DO	10.27	mg/L	NAWQC
PTU3-SW12	Brackish	Field Test	pH	7.95	pH Units	6.5-8.5 ¹
PTU3-SW12	Brackish	Field Test	Salinity	0.16	percent	NAWQC
PTU3-SW12	Brackish	Field Test	Salinity	1.6	ppt	NAWQC
PTU3-SW12	Brackish	Field Test	Temperature	0.7	degrees C	NAWQC
PTU3-SW13	Fresh	Field Test	Conductivity	0.97	mS/cm	NAWQC
PTU3-SW13	Fresh	Field Test	DO	11.83	mg/L	NAWQC
PTU3-SW13	Fresh	Field Test	pH	8.24	pH Units	6.5-8.5 ¹
PTU3-SW13	Fresh	Field Test	Salinity	0.03	percent	NAWQC
PTU3-SW13	Fresh	Field Test	Salinity	0.3	ppt	NAWQC
PTU3-SW13	Fresh	Field Test	Temperature	0.9	degrees C	NAWQC

¹ Standard was obtained from ADEC Surface Water Quality Standards (18 AAC 70)

AAC - Alaska Administrative Code

ADEC - Alaska Department of Environmental Conservation

DO - dissolved oxygen

mg/L - milligrams per liter

mS/cm - microsiemens per centimeter

NAWQC - no applicable water quality criteria

ppt - parts per thousand

Water Quality Criterion Calculator (Cr, Pb, Ni, Zn)

SW10

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
475	11.6	372	250	5.62	275.71	80.4	18.2	64.2

SW13

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
352	7.3	273	183	5.25	191.24	50.2	16	101

SW3

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
382	8.3	297	200	5.35	211.57	56.2	17.3	70.6

SW4

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
389	8.5	302	203	5.38	215.97	63.9	13.7	41.8

**Water Quality Criterion Calculator
(Cr, Pb, Ni, Zn)**

SW5

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
307	5.9	237	159	5.09	161.79	42.2	13.7	89.6

SW5 Dup

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
348	7.2	269	181	5.24	188.42	49.4	15.8	100

SW6

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
263	4.7	202	136	4.90	133.89	33.5	12.2	69.1

SW7

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
286	5.3	220	148	5.00	148.54	42.5	10.3	47.6

**Water Quality Criterion Calculator
(Cr, Pb, Ni, Zn)**

SW7 Dup

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
293	5.5	226	152	5.03	153.02	43.8	10.6	49.5

SW8

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
415	9.4	324	218	5.46	234.07	66.2	16.7	55.9

SW9

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
247	4.2	189	127	4.82	123.93	33.8	9.6	32.7

SW11 (brackish)

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
391	8.6	304	204	5.38	217.25	46.6	24.5	185

SW12 (brackish)

chromium criterion ug/L (67-100)	lead criterion ug/L (0.56-19)	nickel criterion ug/L (49-100)	zinc criterion ug/L (33-340)	In hardness	hardness mg/L	measured calcium mg/L	measured magnesium mg/L	measured sodium mg/L
1271	53.3	1028	693	6.82	918.04	84	172	1390

Attachment D
QA/QC Summary Report

2002 NPDES SURFACE WATER CHEMISTRY QA/QC SUMMARY

1.0 INTRODUCTION

This Quality Assurance/Quality Control (QA/QC) Summary Report presents the evaluation of analytical data for surface water samples collected September 27, 2002, at Point Thomson Unit #3. The samples were collected on behalf of ExxonMobil Production Company (XOM) to support National Pollutant Discharge Elimination System (NPDES) permit applications associated with the proposed Point Thomson Gas Cycling Development Project.

Fifteen surface water samples, including two duplicate samples, were collected from the perimeters of marine, estuarine, and fresh water bodies in the vicinity of the Point Thomson Unit #3 gravel pad and proposed pad expansion area. These samples were collected to provide representative baseline data for potential receiving waters as part of the NPDES permitting process.

Non-conformance of data is identified, discussed, and qualified in this report. Applicable data qualifier definitions are presented in Table 1.

Table 1
Data Qualifier Definition

Qualifier Type	Symbol	Definition
Laboratory	N	Matrix spike recovery is not within control limits. See Section 5.7.

The results of the QA/QC data associated with the analysis of the following parameters are summarized in this report:

- Total Suspended Solids (TSS) by Environmental Protection Agency (EPA) Method 160.2;
- Ammonia by EPA Method 350.2;
- Biological Oxygen Demand (BOD) by EPA Method 405.1;
- Chemical Oxygen Demand (COD) by EPA Method 410.4;
- Total Organic Carbon (TOC) by EPA Method 415.1;
- Arsenic by graphite furnace atomic absorption spectroscopy, EPA 206.2;
- Total Metals (arsenic, barium, calcium, chromium, lead, magnesium, nickel, sodium, zinc) by inductively coupled plasma (ICP) optical emission spectroscopy, EPA Method 200.7 and ICP mass spectroscopy (ICPMS), EPA Method 200.8;
- Volatile Organic Compounds (VOCs) by gas chromatography (GC)/mass spectrography (MS), EPA Method SW8260B; and
- Polynuclear Aromatic Hydrocarbons (PAHs) by GC/MS using selective ion monitoring (SIM) mode, EPA Method SW8270C SIM.

Sample analysis for TSS, ammonia, BOD, COD, TOC, VOCs, and PAHs was performed by CT&E Environmental Services, Inc. (CT&E) at their Anchorage, Alaska, laboratory. Analysis for metals was performed by Columbia Analytical Services, Inc. (CAS) at their Kelso, Washington, laboratory.

A summary of samples submitted for analysis is provided in Table 2.

Table 2
Summary of Samples

Analyses	Total Suspended Solids	Ammonia	Biochemical Oxygen Demand	Chemical Oxygen Demand	Total Organic Carbon	Total Metals	Volatile Organic Compounds	Polynuclear Aromatic Hydrocarbons
Surface Water Samples	13	13	13	13	13	13	13	13
Field Duplicates	2	2	2	2	2	2	2	2
Trip Blanks	-	-	-	-	-	-	1	-

Samples were analyzed in accordance with *Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846*, Third Edition (USEPA, 1999) and *EPA Methods for Chemical Analysis for Water and Wastes* (USEPA, 1983).

The laboratories provided a hard-copy deliverable, including method- and project-specific QC, and a digital deliverable in a Microsoft EXCEL flat file format. Sample results were reported to the method reporting limit (MRL). Standard laboratory data qualifiers were included in the deliverables.

The data review focuses on criteria for the following QA/QC parameters and their overall effect on the data:

- Sample handling (chain-of-custody);
- Holding time compliance;
- Field QA/QC (field duplicates and trip blanks);
- Calibration verification and laboratory control samples;
- Method reporting limits;
- Method blanks;
- Surrogates;
- Laboratory duplicates;
- Matrix spikes/ matrix spike duplicates;
- Analytical methods;
- Precision and accuracy; and
- Completeness.

2.0 SAMPLE HANDLING (CHAIN-OF-CUSTODY)

URS Corporation (URS) field personnel shipped all samples via Alaska Airlines Goldstreak Service to Anchorage, Alaska. URS Anchorage office personnel received and hand delivered sample coolers to CT&E. Sample containers for metals analysis were shipped together in a separate cooler, preserved with nitric acid immediately upon receipt, and then shipped via Alaska Airlines Goldstreak Service to Portland, Oregon. A courier service delivered the samples to the CAS laboratory in Kelso, Washington.

Hard copy chain-of-custody (COC) forms were utilized for the entirety of the project. Cooler receipt forms, documenting sample condition and temperature, were completed upon receipt at the laboratory. COCs, cooler receipt forms, and laboratory case narratives were provided in the final reports and were reviewed to determine if any sample handling procedures may have affected the integrity of the samples and the quality of the resulting data.

All sample containers were received at CT&E intact and within the required $4^{\circ} \pm 2^{\circ}\text{C}$ temperature range. Cooler temperatures were documented on the individual cooler receipt forms. The cooler containing the metals samples was received at CAS with a temperature of 8.2°C , which is acceptable with preserved samples for metals analysis.

All of the COCs were signed and dated as relinquished by the field personnel, and as received by the laboratory.

3.0 HOLDING TIME AND PRESERVATION COMPLIANCE

Holding time for samples is defined as the required time frame from the date of collection within which the laboratory must perform analysis. Recommended holding times and sample preservation are based on EPA guidance.

All samples were extracted and analyzed within the recommended hold time for the analytical procedures utilized for this project. All samples were preserved properly with the exception of the samples for metals analysis. The samples for metals were not preserved immediately upon collection; they were kept cool and shipped to Anchorage for preservation on September 28, 2002. Metals results could be biased slightly low due to possible loss by adsorption to the container walls.

4.0 FIELD QA/QC

Collection and analysis of field QA/QC samples allows for a measurement of precision that takes into account variables such as field sampling and laboratory analysis techniques. Field QA/QC protocol is also designed to monitor possible contamination during collection and transport. For this project, trip blanks and field duplicates (split samples) were submitted in conjunction with the collected samples for analysis. Each field QA/QC sample type is described in the following sections.

4.1 Trip Blank

Trip blanks are prepared in the laboratory using VOC-free water, and are used to monitor volatile contamination of glassware and samples as they travel to and from the field. One trip blank was

carried into the field in the cooler with the VOC sample containers, and the blank was then shipped to the laboratory with the VOC samples for analysis. VOCs were not detected above the MRL in the trip blank.

4.2 Field Duplicates (Split Samples)

Field duplicate samples are collected to provide a measure of precision that takes into account field sampling variables and laboratory analysis techniques. Two field duplicate samples were collected in association with select surface water samples and submitted blind to the laboratory for analysis. The field duplicates were collected as separate samples from the same surface water location. Refer to Table 2 for the specific number of field duplicates and analyses requested.

Table 3 lists criteria used for comparing field duplicates. Field duplicate data are summarized in Table 4 presented at the end of this document. The criteria in Table 3 are recommended for water samples by the Army Corps of Engineers in *Cold Regions Research and Engineering Laboratory (CRREL) Special Report No. 96-9*. Table 4 includes a relative percent difference (RPD) precision calculation for the original sample and field duplicate results. Differences correlate to the RPD as follows:

- An RPD greater than 67 equals a difference greater than two times the result.
- An RPD greater than 100 equals a difference greater than three times the result.

All of the field duplicates had results that compared within a factor of two. No disagreements or major disagreements are reported for field duplicates.

Table 3
Criteria for Comparing Field Duplicate Data

Parameter	Disagreement	Major Disagreement
All	>3x difference when one result is < MRL	>5x difference when one result is < MRL
All, results above MRL	>2x difference	>3x difference

MRL – method reporting limit

5.0 LABORATORY QA/QC

5.1 Calibration Verification

Initial and continuing calibration verification standards were analyzed to monitor laboratory instrument performance prior to, during, and concluding sample analysis. The laboratory standard operation procedures (SOPs) specify these ranges of standards in accordance with the associated EPA method used for the analysis. The laboratory is required to report any discrepancies if they occur and the resulting effect on project samples. No calibration verification discrepancies were identified.

5.2 Laboratory Control Samples

Laboratory control samples and laboratory control sample duplicates (LCS/LCSD) are prepared in the laboratory by spiking a clean matrix (e.g., de-ionized water, Ottawa sand) with a known concentration of target analyte. These samples are processed with a batch of 20 or fewer field samples. LCS/LCSD sample results are calculated for accuracy, by percent recovery (%R), and precision, by RPD. LCS/LCSD %R and RPD are evaluated against laboratory-determined acceptance ranges to monitor if the analytical method was in control.

All LCS and LCSD %R and RPD results were within the specified acceptance ranges.

5.3 Method Reporting Limits

For this project, methods were selected that could provide project-specific detection limits, and results are reported to the laboratory MRL. MRLs were adjusted by the laboratory for sample volume, dilutions, and matrix interference.

5.4 Method Blanks

Method blanks are samples that are prepared in the laboratory using a clean sample matrix. Method blanks are extracted and analyzed concurrent with a batch of 20 or fewer samples for each of the analytical procedures performed for this project. These samples undergo all of the extraction and analysis steps in conjunction with the project samples to monitor for potential contamination during the analytical procedure. A result that is detected above the MRL in a method blank would indicate a laboratory method control problem that could affect data quality. For this project, method blanks were tested at the required frequency. Method blanks reported for the project did not contain target analyte results above the laboratory MRL.

5.5 Surrogates

Surrogate solutions are added to a sample prior to the extraction step of the analytical procedure. The solutions contain known amounts of specific compounds that are similar to the target analytes and are specified for organic chromatographic analytical procedures. Percent recoveries of surrogate compounds indicate overall method performance for each sample by providing a measure of accuracy for the analytical procedures. Organic methods SW8260B and SW8270C SIM utilize this technique. Samples diluted (usually by a factor of five or more prior to analysis) due to high analyte concentration or matrix interference can result in reduced surrogate concentration; however, for this project all surrogate recoveries were within specified acceptance ranges.

5.6 Laboratory Duplicate Samples

Laboratory duplicate samples are repeated, independent determinations of the same sample, by the same analyst, at essentially the same time, and under the same conditions. The sample is split in the laboratory and each fraction is carried through all stages of sample preparation and analysis. Duplicate analyses measure the precision of each analytical method. Laboratory duplicate analyses are performed for 10% of samples analyzed, or at least one per day, for analytical methods not requiring MS/MSDs.

Laboratory duplicates were reported for the following inorganic analyses: ammonia, total metals, TSS, BOD, and COD. All laboratory duplicate samples had RPD's that were within acceptance limits.

5.7 Matrix Spikes

Matrix spike (MS) samples are prepared in the laboratory by spiking an aliquot of the submitted field sample with a known concentration of target analyte. These samples are processed with a batch of 20 or fewer field samples. Inorganic methods require only an MS to fulfill batch quality control requirements. Organic methods include an MS and a matrix spike duplicate (MSD). MS/MSD samples are calculated for accuracy by %R, and precision by RPD. MS/MSD %R and RPD are evaluated against laboratory-specified acceptance ranges to monitor the accuracy and precision of the analytical method for the submitted matrix.

MS sample results were reported for the following general chemistry parameters: ammonia, COD, and total metals (E200.7/E200.8/E206.2). MS/MSD samples were reported for the following organic parameters: TOC and VOCs. Cases where the MS and/or MSD were outside of the specified acceptance ranges are documented below:

- The matrix spike recoveries for barium and nickel were below the method acceptance criteria in the selected spike sample, PTU3-SW1. Matrix interference in this sample resulted from high concentrations of sulfate and TDS. Since all of the samples may have had similar matrix interference, all of the barium and nickel results were qualified with an "N" flag to indicate a possible low bias in sample results.

6.0 ANALYTICAL METHODS

URS used the appropriate EPA-approved methods for analysis of surface water samples and achieved the required detection limits as specified in the project work plan. QA/QC criteria were met for the requested methods, except as noted in the previous sections.

7.0 ACCURACY AND PRECISION

Accuracy criteria monitor agreement of measured results with "true values" as determined by the surrogate and spike recoveries. Accuracy was measured for this project by the analysis of LCS/LCSD (Section 5.2) and surrogates (Section 5.5). Accuracy measurements were within the laboratory-specified ranges.

Precision criteria monitor analytical reproducibility. Precision was measured by the analysis of sample duplicates (field and laboratory), MS duplicates (MSD), and LCS duplicates (LCSD). Precision measurements were within the laboratory-specified limit.

8.0 COMPLETENESS

Completeness is based on two factors: whether or not all of the planned samples were collected (field completeness), and whether or not all of the planned analyses were acceptable (laboratory completeness). The percentage of valid results is reported as completeness. Laboratory completeness is calculated after the QC data have been evaluated and applied to the measurement data. In addition to results identified as being outside of the QC limits established

for a method, broken or spilled samples, or samples that could not be analyzed for any other reason, are included in the assessment of completeness. Only sample results that have been completely rejected are considered invalid for the calculation of completeness. Since URS collected all of the planned samples, field completeness is considered to be 100%. There were no rejected sample results for the project, so the laboratory completeness is calculated at 100%. Since both factors of completeness were achieved, the completeness goals for the project were met.

9.0 REFERENCES

- Grant, C.G., Jenkins, T.F., and Mudambi, A.R. 1996. "Comparison Criteria for Environmental Chemical Analyses of Split Samples Sent to Different Laboratories – Corps of Engineers Archived Data." In *CRREL Special Report No. 96-9*, USACE Cold Regions and Environmental Research Laboratory, Hanover, N.H. May.
- USEPA. 1999. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846*, Third Edition.
- USEPA. 1983. *EPA Methods for Chemical Analysis for Water and Wastes*.

Table 4

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Sample Duplicate Results**

Field Sample ID	Method	Analyte	MRL	Sample Result	Duplicate Result	Units	RPD
PTU3-SW5	EPA 160.2	Total Suspended Solids	2	3	2	mg/L	40
PTU3-SW5	EPA 200.7	Barium, Total	5	30.0	37.9	mg/L	23
PTU3-SW5	EPA 200.7	Calcium, Total	50	42,200	49,400	mg/L	16
PTU3-SW5	EPA 200.7	Chromium, Total	5	ND	ND	mg/L	NC
PTU3-SW5	EPA 200.7	Magnesium, Total	20	13,700	15,800	mg/L	14
PTU3-SW5	EPA 200.7	Nickel, Total	20	ND	ND	mg/L	NC
PTU3-SW5	EPA 200.7	Sodium, Total	100	89,600	100,000	mg/L	11
PTU3-SW5	EPA 200.7	Zinc, Total	10	ND	ND	mg/L	NC
PTU3-SW5	EPA 200.8	Lead, Total	0.02	0.290	0.181	mg/L	46
PTU3-SW5	EPA 206.2	Arsenic, Total	10	ND	ND	mg/L	NC
PTU3-SW5	EPA 350.2	Ammonia-N	0.2	ND	ND	mg/L	NC
PTU3-SW5	EPA 405.1	Biochemical Oxygen Demand	2	ND	ND	mg/L	NC
PTU3-SW5	EPA 410.4	Chemical Oxygen Demand	20	27.4	40.5	mg/L	39
PTU3-SW5	EPA 415.1	Total Organic Carbon	0.5	8.80	9.37	mg/L	6
PTU3-SW5	SW8260B	1,1,1,2-Tetrachloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1,1-Trichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1,2,2-Tetrachloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1,2-Trichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1-Dichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,1-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2,3-Trichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2,3-Trichloropropane	0.002	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2,4-Trichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2,4-Trimethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2-Dibromo-3-chloropropane	0.002	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2-Dibromoethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2-Dichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,2-Dichloropropane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,3,5-Trimethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,3-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,3-Dichloropropane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	1,4-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	2,2-Dichloropropane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	2-Butanone (MEK)	0.01	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	2-Chloroethyl Vinyl Ether	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	2-Chlorotoluene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	2-Hexanone	0.01	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	4-Chlorotoluene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	4-Isopropyltoluene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	4-Methyl-2-pentanone (MIBK)	0.01	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Benzene	0.0005	ND	ND	mg/L	NC

Table 4

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Sample Duplicate Results**

Field Sample ID	Method	Analyte	MRL	Sample Result	Duplicate Result	Units	RPD
PTU3-SW5	SW8260B	Bromobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Bromochloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Bromodichloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Bromoform	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Bromomethane	0.003	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Carbon disulfide	0.002	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Carbon tetrachloride	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Chlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Chloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Chloroform	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Chloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	cis-1,2-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	cis-1,3-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Dibromochloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Dibromomethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Dichlorodifluoromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Ethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Hexachlorobutadiene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Isopropylbenzene (Cumene)	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Methylene chloride	0.005	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Naphthalene	0.002	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	n-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	n-Propylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	o-Xylene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	P & M -Xylene	0.002	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	sec-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Styrene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	tert-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Tetrachloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Toluene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	trans-1,2-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	trans-1,3-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Trichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Trichlorofluoromethane	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8260B	Vinyl chloride	0.001	ND	ND	mg/L	NC
PTU3-SW5	SW8270 SIM	Acenaphthene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Acenaphthylene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Anthracene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Benzo(a)Anthracene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Benzo[a]pyrene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Benzo[b]Fluoranthene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Benzo[g,h,i]perylene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Benzo[k]fluoranthene	0.0935	ND	ND	µg/L	NC

Table 4

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Sample Duplicate Results**

Field Sample ID	Method	Analyte	MRL	Sample Result	Duplicate Result	Units	RPD
PTU3-SW5	SW8270 SIM	Chrysene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Dibenzo[a,h]anthracene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Fluoranthene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Fluorene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Naphthalene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Phenanthrene	0.0935	ND	ND	µg/L	NC
PTU3-SW5	SW8270 SIM	Pyrene	0.0935	ND	ND	µg/L	NC
PTU3-SW7	EPA 160.2	Total Suspended Solids	2	2	4	mg/L	67
PTU3-SW7	EPA 200.7	Barium, Total	5	31.4	33.3	mg/L	6
PTU3-SW7	EPA 200.7	Calcium, Total	50	42,500	43,800	mg/L	3
PTU3-SW7	EPA 200.7	Chromium, Total	5	ND	ND	mg/L	NC
PTU3-SW7	EPA 200.7	Magnesium, Total	20	10,300	10,600	mg/L	3
PTU3-SW7	EPA 200.7	Nickel, Total	20	ND	ND	mg/L	NC
PTU3-SW7	EPA 200.7	Sodium, Total	100	47,600	49,500	mg/L	4
PTU3-SW7	EPA 200.7	Zinc, Total	10	ND	12.6	mg/L	NC
PTU3-SW7	EPA 200.8	Lead, Total	0.02	0.169	0.161	mg/L	5
PTU3-SW7	EPA 206.2	Arsenic, Total	10	ND	ND	mg/L	NC
PTU3-SW7	EPA 350.2	Ammonia-N	0.2	ND	ND	mg/L	NC
PTU3-SW7	EPA 405.1	Biochemical Oxygen Demand	2	2.1	ND	mg/L	NC
PTU3-SW7	EPA 410.4	Chemical Oxygen Demand	20	53.7	51.5	mg/L	4
PTU3-SW7	EPA 415.1	Total Organic Carbon	0.5	17.0	17.5	mg/L	3
PTU3-SW7	SW8260B	1,1,1,2-Tetrachloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1,1-Trichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1,2,2-Tetrachloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1,2-Trichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1-Dichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,1-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2,3-Trichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2,3-Trichloropropane	0.002	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2,4-Trichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2,4-Trimethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2-Dibromo-3-chloropropane	0.002	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2-Dibromoethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2-Dichloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,2-Dichloropropane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,3,5-Trimethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,3-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,3-Dichloropropane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	1,4-Dichlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	2,2-Dichloropropane	0.001	ND	ND	mg/L	NC

Table 4

**Point Thomson Gas Cycling Project
NPDES Surface Water Sampling Event, 9-27-02
Sample Duplicate Results**

Field Sample ID	Method	Analyte	MRL	Sample Result	Duplicate Result	Units	RPD
PTU3-SW7	SW8260B	2-Butanone (MEK)	0.01	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	2-Chloroethyl Vinyl Ether	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	2-Chlorotoluene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	2-Hexanone	0.01	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	4-Chlorotoluene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	4-Isopropyltoluene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	4-Methyl-2-pentanone (MIBK)	0.01	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Benzene	0.0005	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Bromobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Bromochloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Bromodichloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Bromoform	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Bromomethane	0.003	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Carbon disulfide	0.002	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Carbon tetrachloride	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Chlorobenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Chloroethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Chloroform	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Chloromethane	0.001	ND	0.00455	mg/L	NC
PTU3-SW7	SW8260B	cis-1,2-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	cis-1,3-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Dibromochloromethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Dibromomethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Dichlorodifluoromethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Ethylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Hexachlorobutadiene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Isopropylbenzene (Cumene)	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Methylene chloride	0.005	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Naphthalene	0.002	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	n-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	n-Propylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	o-Xylene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	P & M -Xylene	0.002	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	sec-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Styrene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	tert-Butylbenzene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Tetrachloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Toluene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	trans-1,2-Dichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	trans-1,3-Dichloropropene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Trichloroethene	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Trichlorofluoromethane	0.001	ND	ND	mg/L	NC
PTU3-SW7	SW8260B	Vinyl chloride	0.001	ND	ND	mg/L	NC

Table 4

Point Thomson Gas Cycling Project
 NPDES Surface Water Sampling Event, 9-27-02
 Sample Duplicate Results

Field Sample ID	Method	Analyte	MRL	Sample Result	Duplicate Result	Units	RPD
PTU3-SW7	SW8270 SIM	Acenaphthene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Acenaphthylene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Anthracene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Benzo(a)Anthracene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Benzo[a]pyrene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Benzo[b]Fluoranthene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Benzo[g,h,i]perylene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Benzo[k]fluoranthene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Chrysene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Dibenzo[a,h]anthracene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Fluoranthene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Fluorene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Indeno[1,2,3-c,d] pyrene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Naphthalene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Phenanthrene	0.0943	ND	ND	µg/L	NC
PTU3-SW7	SW8270 SIM	Pyrene	0.0943	ND	ND	µg/L	NC

NC - Not calculated

ND - Not detected

mg/L - milligrams per liter

µg/L - micrograms per liter

MRL - Method reporting limit

RPD - Relative percent difference