

**REVIEW COMMENT**

**PROJECT: Fort Wainwright IDW**  
**DOCUMENT: IDW Work Plan**

**LOCATION:** Building 3489

U.S. ARMY CORPS OF ENGINEERS CEPOA-EN-EE-		DATE: March 21, 2003 REVIEWER: Bob Gray PHONE: 353-9949	Action taken on comment by: <u>North Wind, Inc.</u>		
Item No.	Drawing Sht. No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	DESIGN OFFICE C - correction made (if not, explain)	Back check by: (Initials)
1.	Paragraph 1.1, Page 2, 2nd paragraph, 3rd sentence	Change this sentence to read: Contractors must arrange with the FTW Directorate of Public Works (DPW), Environmental Resources Division for access to the building and authorization for storage use.	A	C	
2.	Paragraph 2.1.1, Page 9, 2nd paragraph, 2nd sentence	Add the following to the end of the sentence: per the example found in USARAK PAM 200-1, Page 10-3.	A	C	
3.	Paragraph 2.1.1, Page 10, 2nd paragraph	Replace the first sentence with the entire section 8.1 Selecting a Suitable Container of USARAK PAM 200-1, paragraph 8.1(a - d).	A	C	
4.	Paragraph 2.3.3.1, page 14, first sentence	Delete the (currently CYS Management Services Inc.)	A	C	
5.	Paragraph 3.1, Page 18, 2nd paragraph, 2nd sentence	Immediately following (TCLP) add Test Methods for Evaluating Solid Waste, Physical /Chemical Methods, EPA Publication SW-846.	A	C	
6.	Paragraph 3.5.2.4, Page 29	Add a step that identifies what happens to the GAC vessel once removed from service, i.e. proper marking, disposal, sampling, etc.	A	C	
7.	Paragraph 4.1, Page 31, delete the first paragraph	Not really applicable to the section. If deemed required, move it to the end of the section from it's existing location.	A	C	
8.	Paragraph 4.1.1, Page 32	This first paragraph is incorrect, the new operator will have to apply to GHU for a new permit. This is per Mr. Jerry Williams, ENSR. Change to read that Northwind will be responsible for submitting for a new discharge permit.	A	North Wind currently holds the permit, and the section has been changed to reflect this.	
9.	Paragraph 4.1.2, page 33	Add Environmental Resources Division at the end of FTW DPW.	A	C	
10.	Paragraph 4.4, page 35	Delete the last sentence of the section - speculation and not applicable to the Plan.	A	C	

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11.	Paragraph 4.5, Page 36	Delete the last sentence of the section - superfluous and not applicable to the Plan.	A	C	
12.	Paragraph 5.3, Page 39, second sentence	Between Miscellaneous and waste insert non-regulated.	A	C	
13.	Paragraph 5.3, Page 40, first full sentence	Reword to read: If large amounts of debris are expected to be generated, the placement of an on-site dumpster(s) must to be requested from FTW DPW.	A	C	
14.	Paragraph 6.1, Page 41, last sentence of the second bullet	Change to read: Results should be submitted to the IDW facility operator and copied to FTW DPW Environmental Compliance Division.	A	C	
15.	Paragraph 6.2, Page 41, last sentence of the third bullet	Change to read: Notify FTW DPW Environmental Compliance Division for direction or call Northwind with questions.	A	C	
16.	Paragraph 6.2, Page 42, last sentence of the fifth bullet	Change to read: Results should be submitted to the IDW facility operator and copied to FTW DPW Environmental Compliance Division.	A	C	

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1.	1.0 - 2nd	Remove ; after "firm", this is not a compound sentence with internal punctuation, the ; is not necessary		A	C	
2.	1.1	Has Northwind purchased a new power washer? The old one was stolen. Remove if Northwind has not purchased a new pressure washer		A	North Wind purchased a new pressure washer. It was installed in early March.	
3.	2.0 - 2nd	No one sentence paragraphs please. Re-write second and third paragraphs		A	C	
4.	2.1.1.	Please see RCRA 262.34(a)(2) and (a)(3). The 90-day clock begins the day the waste is accumulated for storage, not the day the characterization is received. This paragraph seems to imply that the 90-day clock begins upon receipt of characterization, which is not true.		A	C	
5.	2.1.2	Metals are sampled by EPA 6010 in the field, but are characterized by a TCLP to determine if they are RCRA waste. Be very careful stating that environmental investigation field sampling will be used to determine if waste is RCRA. This is true in some cases, but not all.		A	C	
6.	2.1.2.1	The first sentence is poorly written. A waste is considered a RCRA waste when it contains a listed RCRA waste (contained in rule) or when it exhibits the RCRA characteristic wastes (ignitability, corrosivity, reactivity, or toxicity). This sentence does not explain this concept well.		A	Sentence adjusted to read: Soil IDW is characterized as clean if it does not contain any RCRA-listed contaminants, does not exhibit any of the RCRA hazardous waste characteristics listed for ignitability, corrosivity, reactivity, or toxicity (see Section 2.1.2.3 for a listing of specified RCRA limits for characteristic wastes, and Title 40 of the CFR,	

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				Part 261 for RCRA regulations pertaining to hazardous waste identification), and meets Alaska Department of Environmental Conservation (ADEC) Level A cleanup goals as shown in Table 1.	
7.	3.1	Change "will require treatment/disposal by another means to 'other means'" or "another mean" for singular/plural agreement.	A	C	
8.	3.1	Stating that RCRA metals may be sampled for TCLP seems to imply that this is optional. RCRA metals must be TCLP analyzed for disposal.	A	C	
9.	3.4 page 26	Operators needs to be possessive operator's	A	C	
10.	4.1	The first paragraph is poorly written with a run-on sentence and a final sentence that does not agree with the subject of the paragraph. Re-write	A	C	
11.	4.1-2nd	Re-write to read "IDW water known or expected to contain these compounds is." Water is the subject of the sentence, compounds is the object of the infinitive; therefore, the verb must be singular to agree with the singular subject.	A	C	
12.	4.1-3rd	It states that the system is designed to treat dioxins and PCBs, paragraph 2 states that it is not intended for this purpose. Why would it be designed to do something if it was not intended to be used for that purpose? Re-write this paragraph and clarify.	A	C	
13.	4.1.1	Why does ENSR have the permit? ENSR is no longer under contract to operate the IDW facility. Northwind should hold the permit.	A	North Wind currently holds the permit. The paragraph has been changed to reflect	

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14.	4.1.3	Separate bullet regarding VOC air bubble sample and DRO sample into two separate samples. These are two separate ideas and should not be combined.	A	C	
				this. ENSR's contract was quantity based, not based on a set period of performance, as is North Wind's contract. ENSR completed/fulfilled the water IDW portion of their contract at the end of May 2003. At that time the permit was changed from ENSR to North Wind.	

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**PROJECT: Fort Wainwright IDW  
DOCUMENT: IDW SSHP**

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1.	Paragraph 3.0, Page 7, second paragraph, fourth sentence	Change reference to CYS Management Services to -- DPW Environmental Resources Services Contractor.		A	C	
2.	Paragraph 3.0, Page 7, second paragraph, fifth sentence	Insert Bldg 3584 immediately before Chip Barn.		A	C	
3.	Paragraph 3.0, Page 7, second paragraph, sixth sentence	Change PW to DPW.		A	C	
4.	Paragraph 4.2.2, Page 14	Add 29 CFR 1917.43 Powered Industrial Trucks citation		A	C	
5.	Paragraph 4.2.9, Page 21	Add a bullet that identifies the applicable 29 CFR 1926 standard.		A	C	
6.	Paragraph 7.0, Page 29	Add the appropriate OSHA standard to this section		A	C	
7.	Paragraph 9.0, Page 33- 35,	Add spill reporting procedures as identified in USARAK PAM 200-1 Section 16.0 First Responder Spill Response.		A	C	
8.	Paragraph 9.0, Page 34	Escape Routes and Procedures, in the first sentence add DPW Environmental Resources immediately following FTW		A	C	
9.	Paragraph 9.0, Page 36, Table 5	Emergency References change the PW Environmental Resources phone number to 1 (907) 353-9195/6489.		A	C	
10.	Paragraph 10.0, Page 37, second paragraph	Add Section 16 immediately following USARAK Pamphlet 200-1.		A	C	

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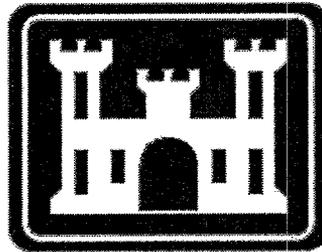
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1.	4.1-1st	No one-sentence paragraphs. Please re-write.	A	C	
2.	4.1 2nd	The semicolon is not used correctly and the sentence is written poorly. Please revise.	A	C	
3.	4.1 2nd	Remove the word "but" from the last sentence. Remove the semicolon after the bullets with the exception of the second-to-last one	A	C	
4.	4.1.2 2nd	Why are we stating how likely poisoning with ethylene glycol is? Inhalation could be quite likely in the event of the fire. Please just report the risk associated with the chemicals and leave out the hazard assessment portions.	A	C	
5.	4.1.3	PAH -spell out first usage of an acronym	A	Acronym spelled out in section 4.1	
6.	4.1.3 2nd	Again, just state that PAH's are liquid at room temperature and vapor at n temp.	A	C	
7.	4.1.4	Provide or reference the PEL for TCE	A	C	

**FINAL**  
**INVESTIGATIVE-DERIVED WASTE MANAGEMENT AREA**  
**OPERATION AND MAINTENANCE PLAN**

**FORT WAINWRIGHT, ALASKA**

**DACA85-02-C-0017**

**Prepared for:**

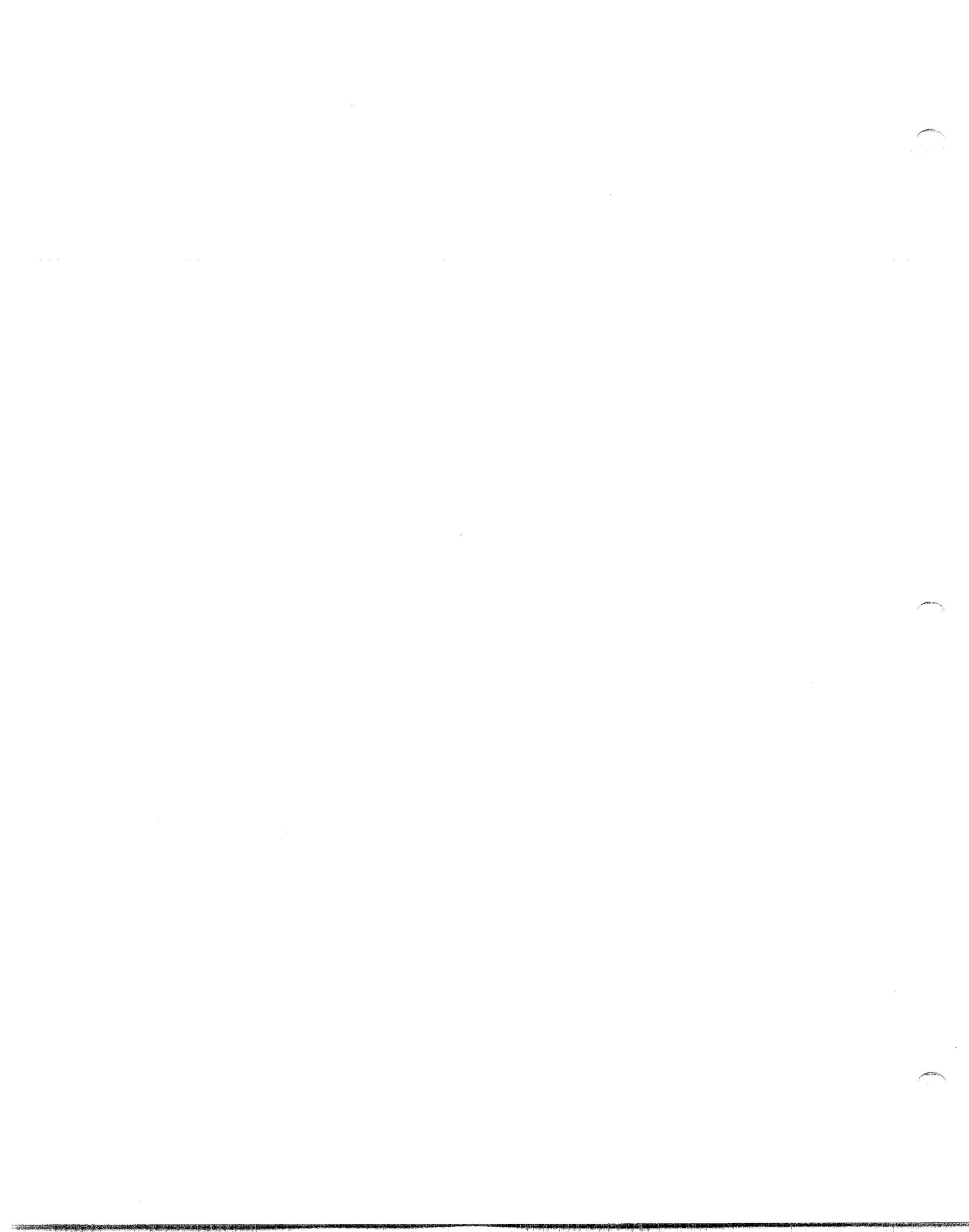


**Department of the Army**  
**U.S. Army Corps of Engineers, Alaska District**  
**P.O. Box 6898**  
**Anchorage, Alaska 99506-6898**

**Prepared by:**

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**Anchorage, Alaska 99501**

**August 2003**



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Appendix C	Discharge Permit
Appendix D	Final Site-Specific Safety and Health Plan
Appendix E	Final Contractor's Quality Control Plan

## LIST OF ACRONYMS

ADEC	Alaska Department of Environmental Conservation
BTEX	benzene, toluene, ethylbenzene, and xylenes
CFR	<i>Code of Federal Regulations</i>
COC	contaminants of concern
DERA	Defense Environmental Restoration Account
DOT	Department of Transportation
DPW	Directorate of Public Works
DRO	diesel range organics
ECD	electron capture detection
EPA	U.S. Environmental Protection Agency
ft <sup>3</sup>	cubic feet
FTW	Fort Wainwright
GAC	granular activated carbon
GC	gas chromatography
GC/MS	gas chromatography/mass spectrometry
GHU	Golden Heart Utilities
gpm	gallons per minute
GRO	gasoline range organics
HCl	hydrochloric acid
HDPE	high-density polyethylene
HERB	chlorinated herbicides
Hg	mercury
HNO <sub>3</sub>	nitric acid
IDW	investigative-derived waste
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
MS	matrix spike
MSD	matrix spike duplicate

## LIST OF ACRONYMS (Continued)

North Wind	North Wind, Inc.
PCB	polychlorinated biphenyl
POL	petroleum, oil, and lubricants
POP	Performance Oriented Packaging
psi	pounds per square inch
RCRA	Resource Conservation and Recovery Act
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TLC	teflon-lined cap
TLS	teflon-lined septa
UN	United Nations
USACE	U.S. Army Corps of Engineers, Alaska District
VOA	volatile organic analysis
VOC	volatile organic compound
WM	wide-mouth (jar)

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## 1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Alaska District (USACE) has tasked North Wind, Inc. (North Wind) with conducting operation and maintenance of the Investigative-Derived Waste (IDW) Management Area at Fort Wainwright (FTW), Alaska, under contract DACA85-02-C-0017. The IDW Management Area was designed to receive IDW from various contractors performing environmental-related work for FTW. When a contractor generates soil or liquid IDW during an investigation or remedial action, the waste is brought to the IDW Management Area for processing. The IDW Management Area has the capability to:

- ◆ Receive liquid and soil IDW;
- ◆ Treat liquid IDW;
- ◆ Characterize soil IDW; and
- ◆ Dispose of liquid and soil IDW.

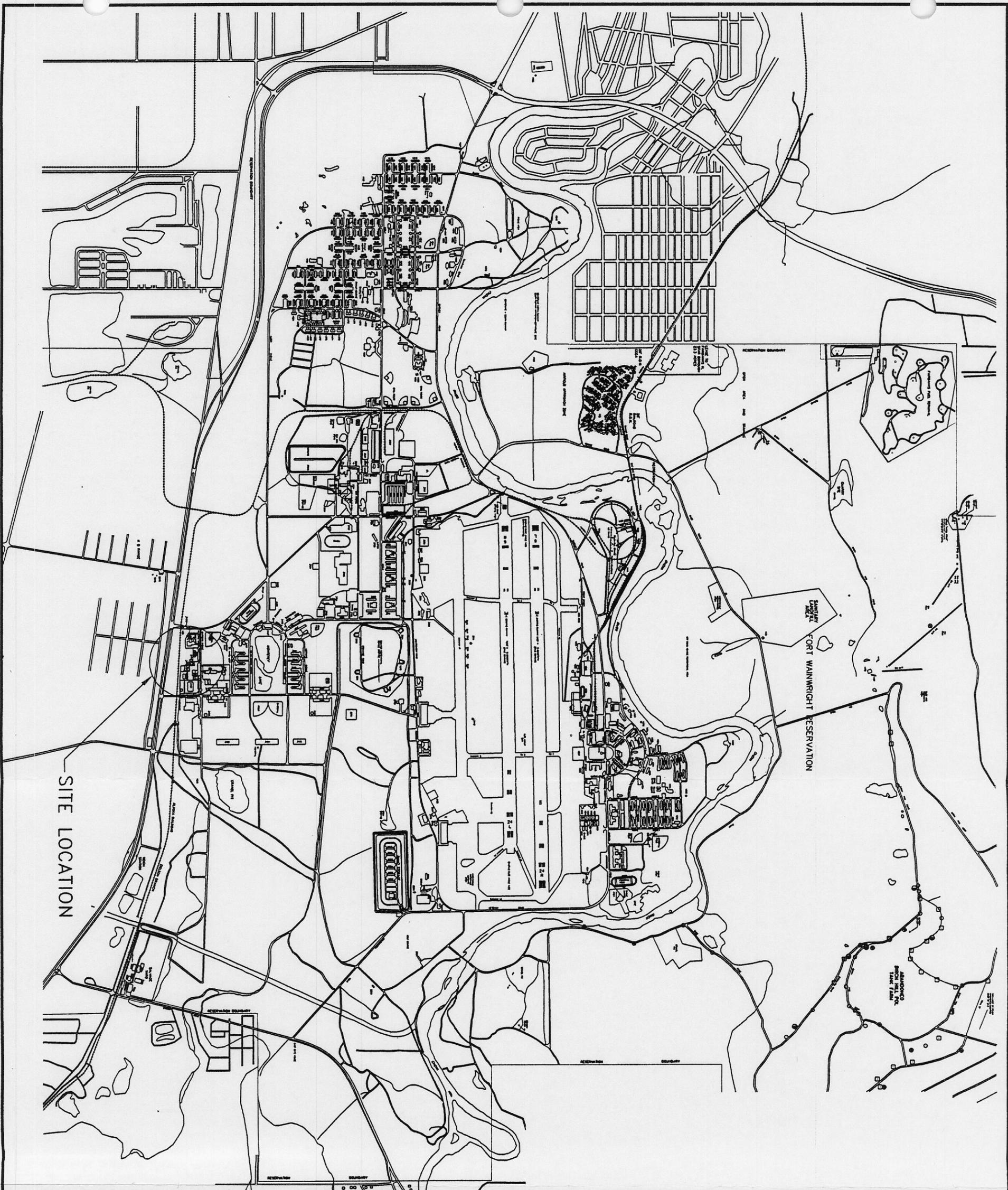
This operation and maintenance plan provides procedures for operating each area of the IDW Management Area. Section 2.0 addresses the acceptance, handling, characterization, and disposal of soil IDW. Section 3.0 addresses acceptance, handling, treatment, and disposal of liquid IDW. Section 4.0 presents the Sampling and Analysis Plan for the liquid IDW treatment system. Section 5.0, the Waste Disposal Plan, addresses the disposal of the various wastes produced by the liquid IDW treatment system. Section 6.0 provides a summary of the IDW facility operational procedures. In addition, Appendix A includes instructions for labeling drums and forms to be used at the IDW treatment facility, Appendix B provides manufacturers' cut sheets, Appendix C presents a copy of the current Golden Heart Utilities (GHU) permit, Appendix D provides the health and safety procedures to be followed while working in the IDW Management Area, and Appendix E presents the Contractor's Quality Control Plan for operation and maintenance of the IDW facility.

Throughout this document, the terms "facility operator", "generating contractor" and "generator" are used. The facility operator is North Wind. The generating contractor is the contracted entity, such as an architectural and engineering firm, that is performing the activity leading to the generation of the IDW. The generator is the U.S. Army Fort Wainwright installation.

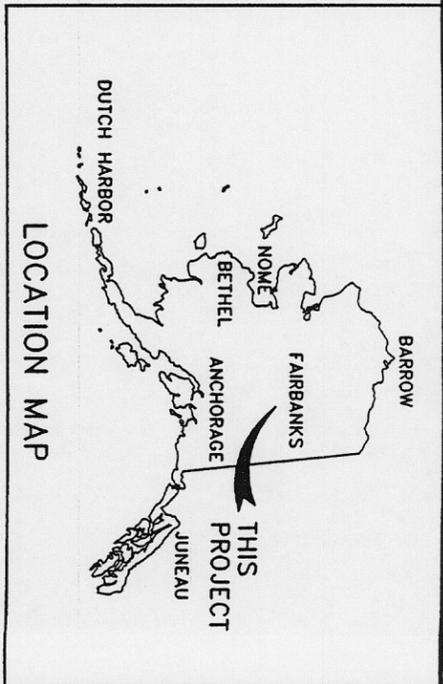
## 1.1 Facility History and Use

FTW is an Army installation located near the city of Fairbanks, Alaska (Figure 1). The IDW management facilities for Fort Wainwright are located in Buildings 3489 and 3476. The liquid IDW treatment system is available for use only during the working hours of Monday through Friday 0800 to 1700. It is located in a separate section on the southern side of Building 3489. The IDW building has a garage door on the western end and man doors on both the east and west ends of the area. The garage door opens to a ramp descending to the receiving trench where contractors discharge their IDW water and decontamination rinsate. A pressure washer is provided for equipment decontamination and cleaning of the area. Treatment equipment, holding and settling tanks, filtration systems, and the drum crusher are located on a raised and bermed area above the receiving trench at the base of the ramp.

The soil IDW management facilities are located at Building 3476 and inside the fenced yard around the building. The building provides heated storage for liquid IDW awaiting analysis during the winter and for some contractor equipment. Contractors must arrange with the FTW Directorate of Public Works (DPW), Environmental Resources Division for access to the building and authorization for storage use. The fenced yard is used as an accumulation area for soil IDW awaiting analysis and for storage of drums to be used in Defense Environmental Restoration Account (DERA) investigations for soil IDW or water containment and transport.



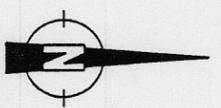
SITE LOCATION



LOCATION MAP

LEGEND

- BUILDING
- ROADS AND PARKING, PAVED
- ROADS AND PARKING, UNPAVED
- RESERVATION BOUNDARY
- RAILROAD
- STREAM
- SHORELINE
- BRIDGE



0 1200 2400  
SCALE IN FEET

SOURCE: CORP. OF ENGINEERS BASE MAP/CH2MHILL

OPERATION AND MAINTENANCE PLAN  
IDW TREATMENT SYSTEM  
FT. WAINWRIGHT, ALASKA

FIGURE 1

SITE LOCATION MAP

DATE: 9/19/00	DRAWN BY: SSR	SCALE: AS SHOWN	DRAWING: WAIN00
C/SC: 1:1PS	ZIP: 18/97	ENGINEER: J. WILLIAMS	CHECKED: J. WILLIAMS
			PROJECT: 9000-255-002

## **2.0 SOIL IDW MANAGEMENT**

The purpose of this section is to provide guidance and serve as an operational information reference for management of soil IDW generated on FTW. The soil IDW temporary storage area is located in the yard at Building 3476, the DERA building, and is located across the parking lot to the west of the liquid IDW treatment facility, as shown in Figure 2. The reason for establishing the soil IDW temporary storage area is to assist contractors performing environmental-related work on FTW by providing an area where soil IDW can be staged, segregated by contaminant type (clean; petroleum, oil, and lubricants [POL]-contaminated; or Resource Conservation and Recovery Act [RCRA]-hazardous), and disposed of properly based on characterization of the IDW soil. This chapter will discuss the process of staging, segregating, and disposing of soil IDW and the procedures for handling empty drums.

### **2.1 IDW Soil Drum Accumulation and Staging**

#### **2.1.1 Receiving Soil IDW Drums**

The bulk of soil IDW expected to be delivered to the IDW Management Area consists of drill cuttings generated during on-going environmental investigations on FTW. Other IDW soil may consist of sediment, sludge from decontamination of equipment, spent carbon, or stockpiled materials also associated with environmental investigations or remedial actions. Generating contractors will give notification to the facility operator of the amount of IDW soil to be delivered and when to expect delivery.

All drums shall be properly labeled (Appendix A) by the generating contractor prior to drum delivery as required by the U.S. Environmental Protection Agency (EPA) and the Army. In addition to the required labels, all identification information must be written on the side of the drum in grease pencil or paint marker per the example found in USARAK PAM 200-1, Page 10-3. At the time of turn-in, an IDW Water/Soil DERA Temporary Storage Drop-Off Form (Appendix A) will be completed by the generating contractor and will include identification of the drum(s) location on the map located on the back of the form. Blank IDW Soil Drop-Off

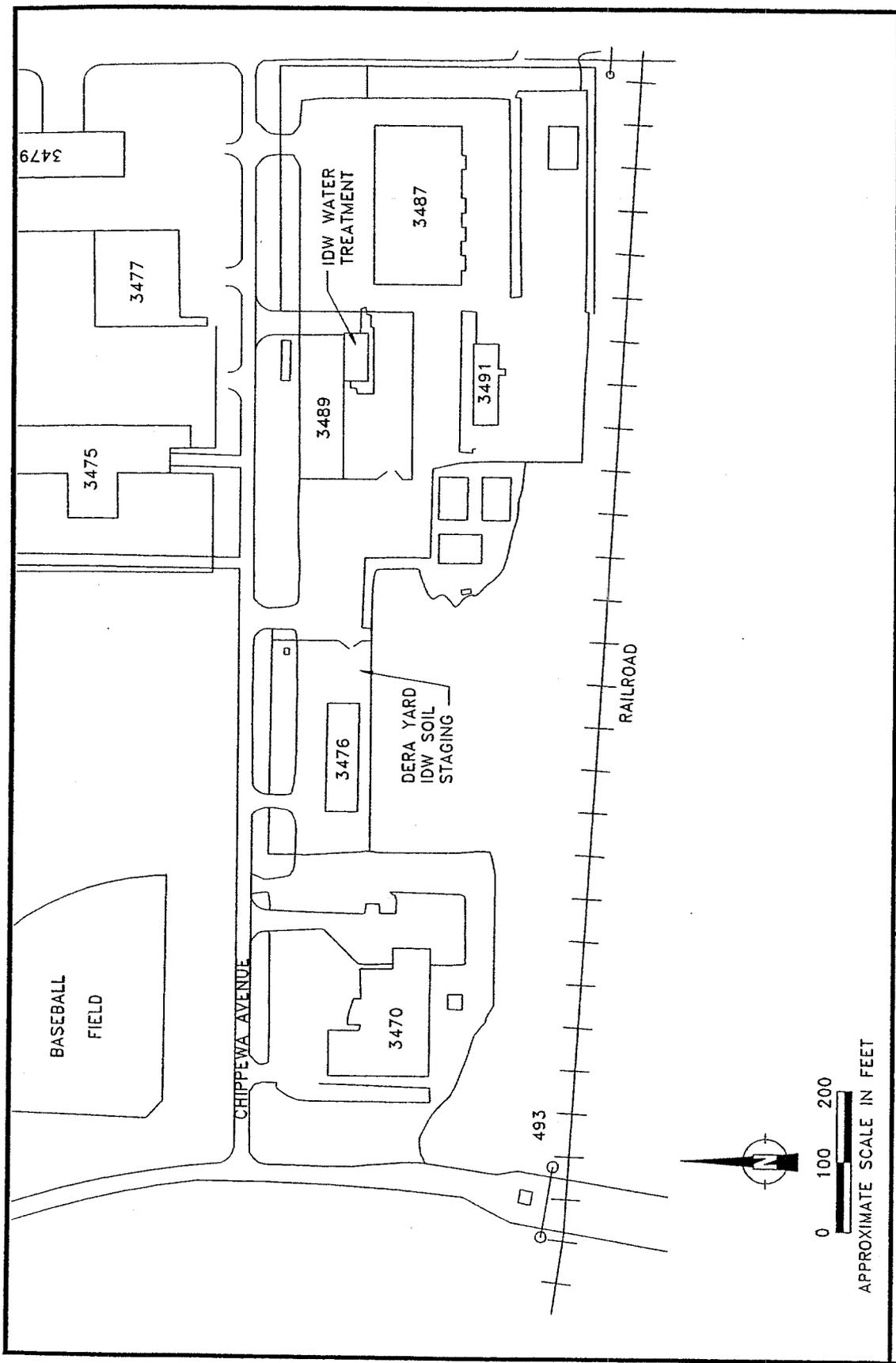
Forms and a pocket for completed forms are located next to the garage door inside the liquid IDW treatment facility.

Received soil IDW drum labeling requirements are as follows.

- ◆ Labels for drums awaiting analysis for final characterization must display the following:
  - WASTE PENDING ANALYSIS – Generating contractor's name and contact number - Site of generation (physical location, well or boring number, etc.) - Date of generation - Suspected contaminants - Date sampled - Date placed in storage.
- ◆ Labels for drums characterized as clean must display the following:
  - CLEAN SOIL – Generating contractor's name and contact number - Site of generation - Date of generation - Date placed in storage.
- ◆ Labels for drums characterized as POL-contaminated must display the following:
  - POL-CONTAMINATED – Generating contractor's name and contact number - Site of generation - Date of generation.
- ◆ Labels for drums characterized as RCRA-hazardous must display the following:
  - HAZARDOUS WASTE - EPA waste code – Date of generation<sup>1</sup> (date drum is filled, sampled, and delivered to IDW facility) - Analytical laboratory sample number – Generating contractor's name and contact number - Generators EPA identification number - Site of generation – Period of accumulation- Proper Department of Transportation (DOT) shipping name – United Nations (UN) number with prefix.

<sup>1</sup>Note: U. S. Environmental Protection Agency requires that hazardous waste be disposed within 90 days of generation.

Initial drum content information and expected date for receipt of analytical results pertaining to each drum delivered to the facility must be supplied by the generating contractor and entered into the IDW Drop-Off Form and placed in the pocket for completed forms located inside the garage door at the liquid IDW facility in Building 3489.



OPERATION AND MAINTENANCE PLAN  
 IDW TREATMENT SYSTEM  
 FT. WAINWRIGHT, ALASKA

FIGURE 2  
 SITE MAP

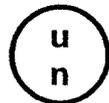
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 C/SC: 1:1  
 DATE: 9/19/00

DRAWN: SSR  
 ZIP: 18/97  
 CHECK: JW



A variety of containers, from 1-gallon to 110-gallon overpack drums, boxes, plastic totes, and bags, may be used to package hazardous materials/regulated waste. The choice of container depends on the type of waste material and the quantity of waste. For storing hazardous materials/regulated waste, containers must be:

- ◆ **In good condition.** The container must not be leaking, rusted (i.e., more than minor surface rust), corroded, dented more than 2 inches, or have non-working filler caps/bungs and/or other sealing devices, any bulges, grooves (other than removed metal), dents in seams/corrugations, or be deteriorated in any other way. If a container leaks or is not in good condition, the contents must be transferred to another container that meets all standards, or be placed in an overpack. Any overpack must be filled with absorbent capable of soaking up liquid, as a precaution against leaks within the overpack.
- ◆ **Made of a compatible material.** The container must be made of a material that will not react or deteriorate when in contact with the material or waste. For example, acids, such as battery acid, cannot be placed in a steel drum because acid will corrode the drum and cause it to leak.
- ◆ **Securely closed.** All containers used to store hazardous materials/regulated waste (except trash) must have a cover or lid and must close and seal tightly enough to prevent spills, including release of fumes. Storing wastes in open buckets is not allowed. Containers must be tightly closed (more than finger tight) after every use. Special funnels that are designed not to leak if the container is overturned, and not to allow fumes to escape, are required if the funnel remains attached to the waste container. Open-head containers must not be used for any liquids, unless pre-approved by DPW.
- ◆ **In compliance with DOT requirements.** All containers used to store hazardous materials or regulated waste on post must meet DOT-specified packaging requirements (Performance-Oriented Packaging). If a package has the symbol shown below on it, it is a DOT-approved package.



Followed by a series of numbers or letters

If in doubt about the suitability of any hazardous materials or regulated waste container, call DPW. Drums that are 85-gallons or larger are overpack containers for leaking drums, and are not for general use. All drums are to be placed on pallets while staged at the facility. Drums must be spaced to allow access to each drum with a drum dolly and so that the lids can be removed. Soil IDW 55-gallon drums should not be filled beyond the first ring down from the top of the drum. In all cases, the maximum acceptable drum weight is 882 pounds per DOT regulations 49 in the

Code of Federal Regulations (CFR) 178.504. The generating contractor can deliver drums containing IDW soil after coordinating the delivery with the facility operator. All soil IDW drums will be staged at Building 3476, the IDW Management Area, on the paved area at the east end or north side of the yard (see Figure 2). The soil IDW Drop-Off Form will be completed with the location of the drums indicated on the reverse side of the form and placed in the pocket for completed forms located inside the garage door at the liquid IDW facility at Building 3489.

### **2.1.2 IDW Soil Sampling/Drum Characterization**

All soil IDW should have corresponding analytical laboratory data sufficient to characterize the IDW soil as clean, POL-contaminated, or RCRA-hazardous. This data may be in the form of laboratory analytical results from the environmental investigation activities during which the soil IDW was generated or laboratory analytical results from samples of each drum. Further laboratory analysis may be required in order to properly characterize drummed IDW for disposal.

All IDW characterization analyses are the responsibility of the generating contractor and should be based on generator knowledge and analytical data. Delivery of analytical laboratory data for soil IDW should be coordinated with the facility operator. Characterization of soil IDW as clean, POL-contaminated, or RCRA-hazardous is dependent upon the criteria in the following subsections.

#### **2.1.2.1 Soil IDW Characterized as Clean**

Soil IDW is characterized as clean if it does not contain any RCRA-listed contaminants, does not exhibit any of the RCRA hazardous waste characteristics listed for ignitability, corrosivity, reactivity, or toxicity (see Section 2.1.2.3 for a listing of specified RCRA limits for characteristic wastes, and Title 40 of the CFR, Part 261 for RCRA regulations pertaining to hazardous waste identification), and meets Alaska Department of Environmental Conservation (ADEC) Level A cleanup goals as shown in Table 1.

**Table 1 ADEC Level A Cleanup Goals**

Analysis	ADEC Level A Cleanup Goal
Diesel Range Organics (DRO)	100 mg/Kg
Gasoline Range Organics (GRO)	50 mg/Kg
Total Benzene	0.1 mg/Kg
Benzene, Toluene, Ethylbenzene, and Xylenes combined (BTEX)	10 mg/Kg

mg/Kg = milligrams per kilogram

### 2.1.2.2 Soil IDW Characterized as POL-Contaminated

Soil IDW is currently characterized as POL-contaminated if it does not contain any RCRA-listed contaminants, does not exhibit any of the RCRA hazardous waste characteristics for ignitability, corrosivity, reactivity, or toxicity, and contains POL contaminants above ADEC Level A cleanup goals. The ADEC Level A limitation may be revised in the future.

### 2.1.2.3 Soil IDW Characterized as RCRA-Hazardous

Soil IDW is characterized as RCRA hazardous if it contains RCRA-listed hazardous materials or exhibits any of the RCRA hazardous waste characteristics of ignitability, corrosivity, reactivity, or toxicity, as shown in Table 2.

**Table 2 RCRA Characteristic Hazardous Waste Criteria**

Characteristic Parameter	EPA Criteria Results (mg/L unless specified)	EPA Hazard Code
Flash Point	< 140 °F	D001 (1)
pH (corrosivity)	pH < 2.0 or >12.5	D002
Reactivity	See 40 CFR 261.23	D003
Arsenic	5	D004
Barium	100	D005
Benzene	0.5	D018
Cadmium	1	D006
Carbon tetrachloride	0.5	D019
Chlordane	0.03	D020
Chlorobenzene	100	D021
Chloroform	6	D022
Chromium	5	D007
o-Cresol	200	D023
m-Cresol	200	D0024
p-Cresol	200	D0025

**Table 2 RCRA Characteristic Hazardous Waste Criteria (continued)**

Characteristic Parameter	EPA Criteria Results (mg/L unless specified)	EPA Hazard Code
Cresol	200	D0026
2,4-Dichlorophenoxy acetic acid	10	D016
1,4-Dichlorobenzene	7.5	D027
1,2-Dichloroethane	0.5	D028
1,1-Dichloroethylene	0.7	D029
2,4-Dinitrotoluene	0.13	D030
Endrin	0.02	D012
Heptachlor	0.008	D031
Hexachlorobenzene	0.13	D032
Hexachlorobutadiene	0.5	D033
Hexachloroethane	3	D034
Lead	5	D008
Lindane	0.4	D013
Mercury	0.2	D009
Methoxychlor	10	D014
Methyl ethyl ketone	200	D035
Nitrobenzene	2	D036
Pentachlorophenol	100	D037
Pyridine	5	D038
Selenium	1	D010
Silver	5	D011
Tetrachloroethylene	0.7	D039
Toxaphene	0.5	D015
Trichloroethylene	0.5	D040
2,4,5-Trichlorophenol	400	D041
2,4,6-Trichlorophenol	2	D042
2,4,5-TP (Silvex)	1	D017
Vinyl chloride	0.2	D043

mg/L = milligrams per liter

## 2.2 Segregation of IDW Soil Drums

Following delivery of drums to the staging facility and receipt of analytical results, the facility operator will segregate the drums according to their characterization. Four types of drums are expected to be segregated at the facility: drums awaiting analytical results for final characterization, clean, POL-contaminated, and RCRA-hazardous. The drum staging area is located at the east end and northern side of the paved area around Building 3476. Proper

clearance (minimum of 5 feet) should be left between each drum pallet to allow movement of drums. Sufficient space between individual drums must be provided to allow for access by a drum dolly and removal of the lids. No more than three 55-gallon drums can be placed on a single standard 42-inch x 48-inch pallet.

## **2.3 Soil IDW Disposal Procedures**

Soil IDW disposal depends on characterization results (clean, POL-contaminated, or RCRA-hazardous). The IDW facility operator is responsible for obtaining laboratory analytical results from IDW generators to determine how the IDW will be disposed. The three different soil IDW disposal methods that are anticipated to occur are outlined in the following subsections.

### **2.3.1 IDW Soil Characterized as Clean**

Drums containing soil IDW characterized as clean will be emptied into an end dump truck provided by the IDW facility operator for disposal at the post landfill designated for construction waste located on River Road. Landfill operators will be provided the analytical results confirming that disposed soil IDW meets the “clean” characterization presented in Section 2.1.2.1.

### **2.3.2 IDW Soil Characterized as POL-Contaminated**

Soil IDW characterized as POL-contaminated is to be thermally treated off-site. The facility operator will remove the POL-contaminated soil from the drums and stockpile it in the lined and bermed stockpile location behind Building 3584, the Chip Barn, by the power plant. Heavy-duty plastic sheeting weighted down with the tires provided at that location will cover the stockpiled soil. All corresponding laboratory analytical results will be provided to DPW personnel prior to moving soil to the stockpile. The thermal treatment facility will be provided with the analytical results of the stockpiled soil and will manage the transport, treatment, and back haul under a contract with DPW. Thermally treated soil that has been confirmed as clean is then returned to FTW for disposal at the landfill location. Arrangement for transport of the soil should be made by DPW.

### **2.3.3 Soil IDW Characterized as RCRA Hazardous Waste**

#### **2.3.3.1 Transportation of RCRA Hazardous Soil IDW**

Soil IDW characterized as RCRA-hazardous must be turned into the FTW Centralized Hazardous Waste Turn-in Point operator located at the turn-in facility in Building 3489 by the IDW facility operator prior to expiration of the 90-day accumulation period deadline. Soil identified as RCRA-hazardous waste by the generating contractor should be delivered immediately to the IDW facility operator to allow timely processing out of the facility. The Hazardous Waste Turn-in Point operator should be provided with the laboratory analytical results, the number of drums and their location in the Building 3476 accumulation yard so they can be moved to their facility in Building 3489 for processing. Prior to turn-in, the IDW facility operator shall provide the analytical results identifying the RCRA waste characteristics.

### **2.4 Empty Drum Handling Procedures**

Empty drums that contained IDW soil that was characterized as clean or POL-contaminated will be triple rinsed in the liquid IDW management area at Building 3489 and examined for deterioration. Decontaminated drums determined to be in good condition will be placed in the recycled drum location in the southeast corner of the fenced yard at Building 3476 for reuse. A "good container," as defined by U.S. Army Alaska, is a container that is not leaking, rusted (i.e., more than minor surface rust), corroded, dented more than 2-inches, or has non-working filler caps/bungs and/or other sealing devices, any bulges, grooves (other than removed metal), dents in seams/corrugations, or is deteriorated in any way. The IDW facility operator will crush drums that are determined to be of no further use with the drum crusher located at the liquid IDW treatment facility. Drum crusher operation procedures are covered in Section 3.0 of this operation and maintenance plan. Rinsate generated during drum cleaning can be treated through the liquid IDW Treatment System. Crushed drums will be piled inside the east gate to the DERA yard (Building 3476) and delivered to the landfill for disposal by the IDW facility operator when a truckload has accumulated or annually, at a minimum.

### 3.0 LIQUID IDW MANAGEMENT

This section has been prepared to address the operation and maintenance objectives for the liquid IDW treatment system located at Building 3489 on FTW. The purpose of the liquid IDW treatment system is to support contractors performing environmental investigations and remedial actions on FTW by providing an engineered system for conditioning liquid IDW prior to discharging to the GHU sewer system. Examples of liquid IDW include purge water from groundwater well installation, sampling investigation equipment decontamination rinsate, and potentially water from oil/water separators. This section presents the procedures to be followed for treating liquid IDW, maintaining and replacing the particulate filters, backwashing and flushing the clay/anthracite treatment media, removing sediment from the receiving trench and settling tank, replacing treatment media, effluent discharge and sampling procedures, solid waste (tank and trench sediment) characterization and disposal, as well as providing manufacturer's specifications and maintenance schedules for components. Refer to Appendix D for health and safety procedures to be followed while at the IDW Management Area.

Processing of IDW liquid consists of the following actions:

1. Allowing the sediment to settle in the drop-off or receiving trench and collecting any sheen with absorbent pads prior to pumping the IDW liquid into a holding tank for further settling;
2. Pumping the liquid from the holding tank through a 50-micron screen filter, a bank of 5-micron fabric filters, a clay/anthracite vessel, and an activated carbon canister before reaching the processed water storage tank;
3. Sampling and analysis of the processed water from the sampling port at the base of the processed water storage tank when the tank is full; and
4. Discharging the processed water to the sewer following GHU review of laboratory results and issuing of authorization to discharge. Should the laboratory results indicate that the concentrations in the processed water do not meet the discharge permit limitations, the storage tank water is reprocessed, generally after changing the activated carbon canister.

#### 3.1 Liquid IDW Acceptance Criteria

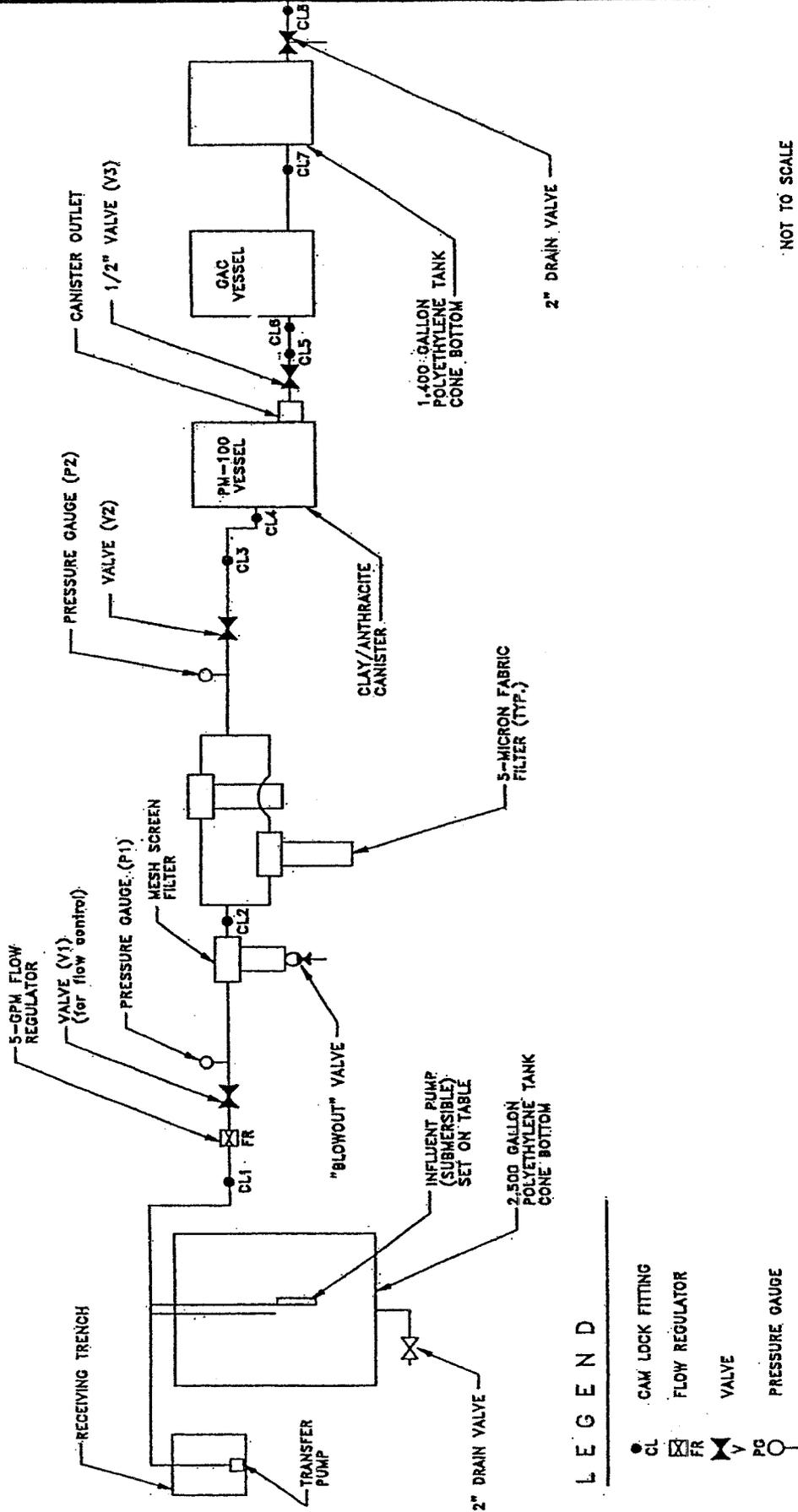
The liquid IDW treatment system is designed primarily to remove dissolved hydrocarbons. RCRA waste and liquid phase petroleum compounds (e.g., measurable thickness of gasoline,

diesel, heating oil, solvents, etc.) are prohibited from introduction to the treatment system. Wastewater mixed with liquid-phase hydrocarbons should not be discharged to the receiving trench or added to the pretreatment tank. Contractors are cautioned against the use of detergents to eliminate the sheen. Further, Simple Green™ is prohibited from use on Fort Wainwright.

Most wastewater introduced into the system will result from groundwater sampling activities, and will be from areas on FTW with historically identified contamination levels and compounds. This wastewater will not require analytical characterization before introduction into the treatment system. Wastewater with polychlorinated biphenyls (PCBs), dioxins, or metals concentrations exceeding the current Fort Wainwright Discharge Permit Limitations are prohibited from introduction to the system and will require treatment/disposal by other means. Contractors generating waste suspected of containing RCRA compounds or exhibiting RCRA characteristics will send samples of the wastewater for toxicity characteristic leaching procedure (TCLP) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846 method laboratory analysis. Wastewater designated for sampling should be drummed and labeled as "waste pending analysis" and must be stored inside of DERA Building 3476 until disposal options are identified. Once analytical results are provided, a determination can be made as to whether the liquid IDW can be treated in the system. If the water is determined to be below permit limits, the liquid will be processed through the liquid IDW treatment system. If any RCRA compounds are found above discharge permit limits, the liquid will be turned into the Hazardous Waste turn-in point operator and processed as hazardous waste following the same procedures used for soil IDW characterized as RCRA waste discussed in Section 2.3.3.

### **3.2 Description of System Components**

The liquid IDW treatment system has been designed to remove suspended solids and moderate levels of dissolved compounds from liquid IDW generated during environmental investigations. The sources of liquid IDW are expected to be limited to well purge water, decontamination rinsate, and potentially water from oil/water separators. Figure 3 presents the components as a schematic.



NOT TO SCALE

**LEGEND**

- CL CAM LOCK FITTING
- ⊠ FR FLOW REGULATOR
- ⋈ V VALVE
- PG PRESSURE GAUGE

OPERATION AND MAINTENANCE PLAN  
 IDW TREATMENT SYSTEM  
 FT. WAINWRIGHT, ALASKA

FIGURE 3  
 WATER CONDITIONING SYSTEM  
 TREATMENT SCHEMATIC

DRAWING: WATCON      DRAWN: SSR  
 C/SC: 1:1              ZIP: 18/97  
 DATE: 9/18/00        CHECK: SL



Copies of manufacturers' equipment performance specifications are included in Appendix B. These specifications should be referred to prior to servicing system components. Components may need to be replaced or repaired occasionally, and exact models may not be available. Under these circumstances, the manufacturer specifications presented in Appendix B should be noted so a suitable replacement component may be selected.

### **3.2.1 Source Pump**

The system will typically pump liquid IDW from a sump in the receiving trench to a 2,500-gallon settling tank. The liquid IDW will be processed from the settling tank through a treatment train designed to remove particulates and hydrocarbons. The water is transferred through the treatment process into the final holding tanks by a submersible pump capable of pumping water at a flow rate of 5 gallons per minute (gpm) at a maximum pressure of 20 pounds per square inch (psi). Manufacturer specifications for the pump are provided in Appendix B.

### **3.2.2 Particulate Filtration System**

The particulate filtration system consists of two banks of filters. First, the liquid IDW passes through a 50-micron, reusable filter to remove the largest particulates. The screen filter, with 1.5-inch inlet/outlet ports, is equipped with a blow-down port (and accompanying valve) for relieving pressure buildup and discharging sediment accumulated on the screen. The filter housing is equipped with access ports for pressure gauges in both the inlet and outlet ports for monitoring pressure drop across the filter element. The filter element is comprised of a molded plastic screen with a polyester mesh sleeve inserted through the center. Flow through the filter is from the center flowing in a radial manner outward, causing sediments to collect in the bottom of the filter and allowing for easy discharge through the blow-down port. A description of the filter is included in the catalogue cuts provided in Appendix B. Under certain circumstances, such as treatment of water with high sediment loads, the 50-micron filter element may be removed to prevent continuous clogging, allowing the 5-micron filter bag to intercept the bulk of the particulate matter.

Discharge from the 50-micron filter will be directed through a pair of 5-micron filters in parallel to remove the smallest particulates. The discharge pipe is equipped with a pressure gauge on the outlet side of the 5-micron filters for measurement of pressure drop across the filters. The disposable 5-micron filter elements are configured in parallel and are easily changed by unthreading the housings. The 5-micron filters are typically changed for each new batch of IDW water treated.

### **3.2.3 Organophylic Treatment System**

After removal of the solids from the liquid IDW through settling and filtering, the hydrocarbons are removed by adsorption to organophylic, typically clay/anthracite, treatment media. The adsorption of hydrocarbons takes place in one of two adsorptive media vessels plumbed in series. The first vessel contains approximately 10 cubic feet (ft<sup>3</sup>) of clay/anthracite treatment media. Filtered, untreated water will enter the vessel from the top and be distributed evenly across the media by a distributor. As the liquid IDW flows through the media, large organic compounds are adsorbed. The liquid IDW is then collected from the bottom of the vessel through a collector. The liquid IDW then flows to the second vessel containing 10 ft<sup>3</sup> of granular activated carbon (GAC). The GAC media removes the more volatile organic compounds and completes the liquid IDW treatment process. Manufacturer information on the treatment media is included in Appendix B.

The adsorptive media vessels are each 30 inches in diameter and have a media bed thickness of 3 feet. No gravel bedding is required for the bottom of the beds; treatment media provide adequate drainage with the distributor and collector provided.

### **3.2.4 System Piping and Instrumentation**

The liquid IDW treatment system is designed with 1.5-inch diameter, oil-resistant, flexible pipe equipped with quick disconnect fittings between major components to allow for repositioning of the components. The particulate filter bank and piping for the 5-gpm flow regulator and system valves consist of 1-inch-diameter, galvanized steel piping. The drains for the holding tanks consist of 2-inch diameter galvanized steel pipe with sampling and discharge valves. A 0.25-inch sample port is installed in the drain pipe for confirmation sampling of treated liquid IDW.

Treated IDW water is sampled for DRO, GRO, and BTEX when each 1,200-gallon batch is completed. Sampling for volatile organic compounds (VOCs) and additional contaminants is required when it is suspected that the source was contaminated with those compounds. Upon receipt from the laboratory, the IDW facility operator submits sample results to GHU. GHU reviews the results against the discharge permit limitations and provides authorization to the IDW facility operator for discharge if concentrations are within limits. Following authorization to release from GHU, the treated water from the holding tank is released to the sewer under the active GHU permit (Appendix C). The permit must be renewed by the IDW facility operator annually in early June. The water pressure instrumentation has been designed to provide the operator with sufficient information to determine if the system is operating correctly and to guide the required service. The instrumentation consists of two pressure gauges with a 3-inch face for easy viewing. Pressure gauges are installed on the intake port of the 50-micron filter and on the outlet of the 5-micron filters to measure the total pressure drop across the particulate filters. The use of the pressure drop measurements is discussed in Section 3.2.2.

### **3.3 System Operation**

#### **3.3.1 Routine Liquid IDW Treatment**

Water placed in the discharge trench is pumped to the 2,500-gallon settling tank at the end of the day after all treatment has stopped. When the 2,500-gallon pretreatment, cone-bottom settling tank has had no water from the receiving trench pumped to the tank for at least 12 hours (sufficient time for large particulates to settle), the liquid IDW is ready for treatment. The treatment system should be inspected prior to operation to ensure that the components are connected as shown in Figure 3 and that all valves and drains are in the positions described for the intended procedure.

The procedure for treating liquid IDW is as follows (refer to Figure 3):

1. Before energizing the system, look for loose piping and any signs of damage and leaks. If the system appears to be damaged or the valves are not operating correctly, DO NOT ENERGIZE. Resolve the problem prior to liquid IDW treatment. Record the date on the corresponding tank information board any time a new batch of IDW water is started.

2. Assure all valves are open (see Figure 3) and energize the system by plugging in the pump (electrical outlets are located on the north wall of the IDW management area).
3. Walk the length of the treatment system looking for leaks and check the pressure gauges. If there is a 10 psi or greater difference between the pressure gauges on the intake to the particulate filters and the intake to the clay/anthracite treatment vessel, blow-down the 50-micron filter into a clean bucket by opening the drain valve at the bottom of the filter housing. Change or clean the 50-micron filter element if necessary or change the 5-micron filter bank. If there is a 20 psi or greater difference, then immediately de-energize the system and investigate the component(s) between the gauges and refer to Section 3.5, System Maintenance.
4. Record any filter element replacement. This is recorded on the white board attached to the settling tank and typically takes place prior to beginning the processing of a new batch.
5. After the liquid IDW in the pretreatment tank has been pumped, de-energize the system (unplug the pump) and check the lines, gauges, and valves for any leaks or problems that may have occurred during pumping.
6. Police the area for any debris and make sure all hoses and pumps have been stored properly.

### **3.3.2 Clay/Anthracite Vessel Backwash Procedure**

The clay/anthracite treatment media vessel will require backwashing as part of the normal operations. Backwashing of the media is performed to remove the buildup of solids accumulated in the pores of the treatment media. Backwashing should be considered when a pressure differential between pressure gauges reaches 5 psi following cleaning and replacement of the filters, and must be performed when the differential is 10 psi. The backwash procedure will require the introduction of clean water or the re-introduction of treated water in the reverse direction through the vessel. The procedure for backwashing the clay/anthracite vessel is as follows:

#### **Step:**

1. Use the pump provided for transfer of water into the receiving trench and rinse it to remove any sediment or debris. Place the pump into a clean, 55-gallon drum of potable water.
2. Securely connect the pump hose to the quick disconnect (CL5 in Figure 3) at the outlet of the clay/anthracite vessel.
3. Connect one end of a detachable flexible hose to the quick disconnect at the inlet of the clay/anthracite vessel (CL4 in Figure 3). Place the other end of the hose into the receiving trench.

4. Energize the pump.
5. Continue to run the pump for 10 minutes and/or until the water entering the pretreatment tank is clear.
6. De-energize the pump.
7. Follow the Quickflush Procedure (Section 3.3.3).

### **3.3.3 Clay/Anthracite Vessel Quickflush Procedure**

After running the backwash procedure, configure the clay/anthracite vessel for quickflush to remove residual liquid IDW from the vessel.

Step:

1. Connect one end of a detachable flexible hose to the submersible pump and the other end to the quick disconnect fitting at the inlet to the clay/anthracite vessel (CL4 in Figure 3). Place the pump into a source of potable water (clean, 55-gallon drum).
2. Connect one end of a detachable flexible hose to the quick disconnect fitting at the outlet of the clay/anthracite vessel (CL5 in Figure 3). Direct the other end of the hose into the receiving trench.
3. Energize the pump and operate until the 55-gallon drum is empty.
4. De-energize the pump.
5. Reconnect all lines in the system into their normal operating configuration (see Figure 3).
6. Remove the pump from the potable water source, and drain and store the pump and hoses properly.

### **3.4 Drum Crusher Operation**

The drum crusher located in the treatment facility is a Rampactor model number 6036N, 220-volt compaction unit. Prior to operation, read all manufacturer's warnings and operating instructions in Appendix B. The compactor takes drums up to 85 gallons in size. All drums must be decontaminated prior to compaction. Drum decontamination procedures consist of triple rinsing with a pressure washer. All rinsate from decontamination procedures must be captured and placed in a pre-treatment tank for eventual treatment.

Following decontamination procedures, drums are placed in the Rampactor's chamber, making certain that the drum's bottom edge completely encircles the raised base plate on the floor of the

chamber. Close the chamber door and make certain that the door latch is fully engaged prior to operation. Turn on the circuit breaker (located on the wall behind the compactor) to activate the electric motor and hydraulic pump.

Used steel drums no longer suitable for further use will be triple rinsed and then crushed with the drum crusher located in the liquid IDW management facility following the procedures in the operator's manual. Crushed drums will be piled inside the east gate to the DERA yard (Building 3476) and annually delivered to the landfill for disposal.

### **3.5 System Maintenance**

#### **3.5.1 Regular Inspections**

The treatment system should be inspected each day prior to operation for leaks and damage that may result from normal wear and accidents. Attention should be paid to the position of hoses with respect to tanks and vessels containing liquids. Hoses attached to pumps in the tank must be coiled and tied off to the top of the tank or removed from the tank to prevent gravity drainage of liquid IDW through the line. Treatment vessels also contain liquids, and care should be taken to prevent gravity drainage of liquid IDW from lines connected to those vessels.

#### **3.5.2 Routine Maintenance Procedures**

The following five sections describe routine procedures for maintaining the proper function of the liquid IDW treatment system.

##### **3.5.2.1 Filter Element Service**

Typically, the 50-micron filter is cleaned and the 5-micron filters are changed prior to beginning treatment of a new batch of IDW water. Filters are also cleaned and changed when the pressure drop across the filter bank is 10 psi or greater during system operation. The following procedure should be followed in order to reduce the pressure drop across the filter bank.

Step:

1. The 50-micron filter element should be blown out by opening the blow-down port at the bottom of the filter housing while the system is operating (Figure 3). The

escaping liquid IDW should be captured in a clean, 5-gallon bucket and returned to the pretreatment side of the system.

2. If the pressure difference drops below 10 psi, no further service is required.
3. If the pressure remains above 10 psi, de-energize the system and close all valves (in Figure 3). Drain the 50-micron filter sump and remove the filter element. Rinse the filter screen until clean. The water used to clean the filters should flow into the receiving trench. Replace the 50-micron filter element, open all valves, and energize the system. Note the pressure drop across the filter bank.
4. If the pressure drop is below 10 psi, no further service is required, return to normal operation.
5. If the pressure drop is 10 psi or greater: de-energize the system; close all valves; drain the 5-micron sumps into a clean, 5-gallon bucket; and replace the 5-micron elements. Open all valves and return to normal operation. Return drained liquid IDW to the receiving trench.
6. If the pressure still does not drop below 10 psi, then the clay/anthracite vessel should be backwashed following the procedures presented in Section 3.3.2.
7. If filter components are damaged, consult the manufacturer specifications in Appendix B and replace the damaged component(s).
8. Used filter elements are stored in a drum for later disposal as detailed in Section 5.3.

### **3.5.2.2 Receiving Trench and Pretreatment Tank Sediment Removal**

The receiving trench accumulates sediment/sludge to the degree where it requires cleaning. The amount of equipment decontamination by contractors will generally determine the frequency for cleaning. The trench can be easily shoveled by removing the floor grating and using a plastic snow shovel to remove the sediment/sludge for placement into a lined 55-gallon drum. Two people are required for cleaning the deeper sump for safety and efficiency. The first person should remove the floor grates and shovel the sediment/sludge into 5-gallon buckets, then pass the bucket(s) to the second employee for emptying into the lined 55-gallon sludge drum.

The cone bottom pretreatment holding tank will require removal of settled solids at least once per year depending on the volume processed. Removal is recommended when the bottom of the cone-bottom tank is partially full of sediment. It is recommended that some liquid IDW (approximately 50-gallons) be retained in the tank to maintain a slurry. Upon removal of the sediment, the tank should be pressure washed to remove debris from the sides of the tank. Refer

to the Site-Specific Safety and Health Plan in Appendix D for proper safety precautions. The procedure for removing the sediment is as follows:

Step:

1. Open valve at the base of the tank and allow clear water to flow into the receiving trench until the sludge appears. Fill the 5-gallon buckets with sediment until the discharge flows clear.
2. After the discharged sediment has been allowed to settle in the 5-gallon bucket (about 24 hours), pour off the clean water into the receiving trench and place the sediment in the 55-gallon sump sludge drum for later disposal.
3. Repeat as necessary. Close valve.
4. Pressure wash the interior of the tank when low use of the system is expected and all residual water can be drained into the receiving trench.
5. Label the sediment drums by the procedure listed in Section 5.0, Waste Disposal Plan.
6. Sample the sediment as per Section 4.0, Sampling and Analysis Plan.

### **3.5.2.3 Clay/Anthracite Vessel Media Replacement**

The clay/anthracite media will require replacement when backwashing fails to lower the pressure drop across the media to less than 10 psi. Prior to removal of the media, refer to the Site-Specific Health and Safety Plan in Appendix D for safety precautions. More than one method of removing the media from the vessel may be possible; however, the following procedure is recommended. (See also the manufacturers' cut sheets located in Appendix B.)

Step:

1. De-energize system (unplug pumps).
2. Close all valves.
3. Drain all liquid from the clay/anthracite vessel into buckets using the valve 3 (Figure 3) and empty buckets into the receiving trench.
4. Remove the bolts from the vessel cleanout port.
5. Remove the cover from the vessel cleanout port.
6. Using a small shovel, remove all sediment and spent media from the vessel and place it in clean, 55-gallon drums for disposal.
7. Label the drums for disposal using the procedure set forth in Section 5.0, Waste Disposal Plan. Disposal will be based on characterization sampling specified in Section 4.0, Sampling and Analysis Plan.
8. Close Valve 3 (Figure 3).

9. Place a funnel or tremie tube through the Upper Vessel Cleanout Port and add clay/anthracite media to the vessel to a level just below the diffuser (approximately 10 ft<sup>3</sup>).
10. Replace the vessel cleanout port and secure the bolts.

#### **3.5.2.4 Granular Activated Carbon Vessel Replacement**

Refer to the Site-Specific Safety and Health Plan in Appendix D prior to removal of the media.

Step:

1. De-energize system (unplug pumps).
2. Close all valves.
3. Drain all the liquid from the GAC Vessel (Figure 3) into clean, 5-gallon buckets using the vessel drain valve.
4. Empty the buckets into the pretreatment trench after all the liquid has been drained from the vessel.
5. Disconnect all fittings and hoses from the old vessel and place them on the new vessel.
6. The used GAC vessels will be removed from the system and turned in to the FTW Hazardous Waste Turn-in Point Operator for disposal. The used vessels will be properly labeled, sampled, and processed in compliance with RCRA requirements.
7. Reopen all valves and re-energize.

#### **3.5.2.5 Drum Crusher Maintenance**

See Appendix B for manufacturer's maintenance and service instructions.

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## 4.0 SAMPLING AND ANALYSIS PLAN

This Sampling and Analysis Plan presents the methods by which treated wastewater, treatment tank sludge, and spent treatment media will be sampled for suspected and/or known contaminants. The treatment system will be handling wastewater from a wide variety of FTW environmental cleanup and investigation sites. Accordingly, the contaminants of concern (COCs) are potentially very broad, although the system is intended to treat POL-contaminated water only. This plan addresses the constituents that have historically been detected at environmental sites on FTW. Contaminants will be introduced to the system from various waste streams, including but not limited to rinsate from equipment decontamination, purged groundwater, residual water from tank evacuations, and potentially residual water from oil/water separators.

### 4.1 Treatment System Effluent

This system is not intended for treatment of water contaminated with other chemicals, including halogenated solvents, various organopesticides and PCBs, dioxins/furans, oil and grease, VOCs, semivolatile organic compounds (SVOCs), and metals. IDW water known or expected to contain these compounds is treated as hazardous waste and turned in to the FTW Centralized Hazardous Waste Turn-in Point for disposal following the same procedures for soil discussed in Section 2.3.3.

The procedure for turning in wastewater to the IDW treatment system facility operator discussed in Section 3.1 includes completing an IDW Drop-Off Form (included in Appendix A). These forms require the contractor generating the waste to identify the potential COCs and to identify the known contaminants. The wastewater treatment system is capable of removing large organic compounds, such as dioxins and PCBs, if small or unknown quantities are present, although the system is not intended for this purpose. IDW water known or expected to contain these compounds is not accepted although small amounts of these compounds may possibly be present in some water. The system is designed primarily for treatment of smaller, more soluble compounds, such as many of the volatile aromatic compounds. The GHU discharge permit does

not allow discharge of PCBs or dioxins. The treatment system is expected to remove hydrocarbons to levels that are acceptable for discharge to the GHU sewer system.

#### **4.1.1 Permit Requirements**

North Wind, as the current operator of the liquid IDW treatment facility, holds a discharge permit with GHU for discharge of treated and authorized amounts of water to the sewer. Appendix C includes a copy of the permit.

This permit requires monitoring of each 1,200-gallon batch of treated water. The required analyses include DRO by ADEC Method AK102, GRO by ADEC Method AK101, and BTEX by EPA Method 8021B. Other analyses are required if compounds other than POL contaminants are suspected as provided for in the permit. These additional sampling and analyses requirements are performed by the IDW facility operator, and discharges to the sewer system are coordinated through GHU. This Sampling and Analysis Plan presents the sampling procedures and methodologies expected to provide reasonable confidence that target analytes expected to be introduced to the treatment system will not be discharged to the sewer system at levels exceeding the current GHU permitted limits.

#### **4.1.2 Analytical Methods and Sampling Frequency**

Verification sampling is to be performed at 1,200-gallon intervals. Verification samples are to be analyzed by the appropriate EPA and ADEC methods for detecting the specific COCs as listed on the GHU Discharge Permit (Appendix C). Table 3 presents a list of the potential categories of COCs and the EPA and ADEC methods that will be employed to test for these constituents.

**Table 3 Wastewater Sample Analysis Methods**

Parameter <sup>1</sup>	Method No.: Extraction/Analysis
Total Recoverable Petroleum Hydrocarbons	9071/418.1
Gasoline Range Organics/BTEX	AK101/8021B
Diesel Range Organics	AK102
Volatile Organic Compounds	8260B
Semivolatile Organic Compounds	3510/8270C
Pesticides/Herbicides/PCBs	3510/8080
Dioxins/Furans	3510/8290
Metals (RCRA 8) <sup>2</sup>	3050/6010
Ethylene Glycol	8015

<sup>1</sup> If constituents are suspected that are not included in this table, then the appropriate analyses shall be selected.

<sup>2</sup> RCRA Metals; additional metals analysis may be warranted depending on COC.

Samples collected from a tank experiencing solely POL contamination may be sampled for GRO, DRO, and BTEX at the discretion of the IDW treatment facility operator or FTW DPW, Environmental Resources Division. Wastewater generated from FTW operable units and sites contaminated with compounds other than those associated with POL must be sampled after treatment for any other potential COCs.

#### 4.1.3 Sample Collection Procedure

Samples of treated water will be collected from the post-treatment holding tank at the sampling port provided for that purpose. Water samples will be collected by the following procedure:

- ◆ The record of discharges to the treatment system will be checked to confirm that the appropriate COCs will be included in the analysis.
- ◆ Label the laboratory supplied bottles for each of the analytical methods to be performed.
- ◆ Sampler should wear nitrile gloves.
- ◆ Using the sampling valve at the discharge of the tank, drain water into the deep tray until any settled sediment is dispersed (generally only a few ounces).
- ◆ Collect the sample from the sampling port with very slow flow for the VOC sample also assuring the VOC sample vial has no air bubble.
- ◆ DRO samples can be collected at full flow rate.
- ◆ If the water has a cloudy appearance, the sampler will make a note on the chain-of-custody record.

- ♦ Samples will be logged onto a chain-of-custody record, packed into a cooler, and submitted for laboratory analysis. Records of the samples and analyses will be kept in a file maintained by the IDW treatment facility operator.

#### 4.2 Spent Water Filter and Absorbent Pad Characterization

Used 5-micron water filters and adsorbent pads used for collection of sheen in the receiving trough are accumulated in a lined drum in the IDW water treatment area. These are disposed annually and should be sampled annually for eight RCRA metals and BTEX to provide a profile for disposal.

#### 4.3 Treatment System Tank Sludge Characterization

The receiving trench and cone-bottom settling tank will require removal of the accumulated solids. A composite sample of the sludge will be collected for waste characterization. If more than one drum of sludge is produced from a tank, the sample will be a composite: where soil from each drum is homogenized together and a sample is collected from the mixture. A sample of the sludge will be collected at the time the waste is removed from the tank to facilitate the disposal process and to avoid conflict with RCRA timelines. The sludges will be characterized by EPA methods corresponding to the wastes that have potentially been introduced to the tank. With the exception of DRO, GRO, and BTEX for POL waste characterization, samples will be submitted for TCLP analysis as shown in Table 4.

**Table 4 Solid Waste Analysis Methods**

Parameter <sup>1</sup>	Method No.: Extraction/Analysis
Gasoline Range Organics/BTEX	AK101/8021B
Diesel Range Organics	AK102
TCLP Volatile Organic Compounds	1311(ZHE)/8260B
TCLP Semivolatile Organic Compounds	1311/8270C
TCLP Pesticides/Herbicides/PCBs	1311/8080
Dioxins/Furans	8290
TCLP Metals (RCRA 8) <sup>2</sup>	1311/6010
Ethylene Glycol	8015M

<sup>1</sup> If constituents are suspected that are not included in this table, then the appropriate analyses shall be selected.

<sup>2</sup> RCRA Metals; additional metals analysis may be warranted depending on COC.

The sludges will be decanted of water to the extent possible so waste characterization may be applied by methods for solids only. Decanted water will be re-introduced to the treatment system.

The characterization process will consist of the following:

- ◆ Drumming (in UN 1A2/Y150/S [49CFR 178.503] containers) the solid wastes removed from the pretreatment tank and labeling the drum(s) with the note "Pending Analysis" (Appendix A);
- ◆ Decanting fluids to the greatest extent possible;
- ◆ Confirming the source COCs (from discharge records) and submitting samples for laboratory analysis accordingly; and
- ◆ Preparing final characterization documentation based on laboratory results and requirements specified in Section 5.0, Waste Disposal Plan.

#### **4.4 Treatment Media Characterization**

The replacement of spent treatment media will generate approximately 500 pounds (depending on moisture content) per vessel. The spent treatment media will be containerized in open-top 55-gallon DOT drums. The characterization process will be identical to the process outlined in Section 4.2 with composite samples collected from each vessel. The clay/anthracite treatment media will require characterization for disposal each time the media is removed.

##### **4.4.1 Sample Custody Documentation**

Each shipment of samples is accompanied by the completed, signed, and dated chain-of-custody records. The chain-of-custody record is a written document that identifies and tracks a sample from the time it is collected until the time it is analyzed. A sample is under a person's custody when:

- ◆ It is in that person's physical possession,
- ◆ It is in that person's view after being in that person's possession,
- ◆ It was in that person's possession and then he or she locked the sample in a cooler or refrigerator to prevent tampering, or
- ◆ It has been placed in a designated or secure area by that person.

Each time the samples change possession, both individuals must sign the chain-of-custody record. After sample collection and prior to shipment, samples are packaged and preserved to ensure sample integrity during shipment. The chain-of-custody record will be placed in a waterproof, plastic bag and secured to the inside lid of the cooler shipping container. The chain-of-custody records will include the specific chain-of-custody seal number(s). The lid of the shipping container is secured at a minimum of two locations with strapping tape. Signed custody seals are affixed on the front-right and back-left of the cooler.

## **4.5 Analytical Program, Methods, and Procedures**

Subcontract laboratory analytical services are selected based upon a number of criteria to include capability and capacity of the laboratory to perform the work, analytical certifications, and demonstrated past performance. All analytical data submitted to the subcontract laboratory are generated as definitive data.

### **4.5.1 Analytical Laboratory Services**

Primary chemical analytical services are obtained from a laboratory that has been validated and approved by the USACE validation and accreditation program. The subcontract laboratory will maintain current Underground Storage Tank Laboratory Validation by ADEC methodology.

### **4.5.2 Analytical Methodology**

Analytical methods are defined by EPA SW-846 (EPA 1986, 1994, 1996), ADEC (1999), and American Society for Testing and Materials methodology. The following brief narrative describes the analytical technique and instrument detection for the analytical methodologies.

- ♦ Analysis of samples for petroleum hydrocarbons is performed by gas chromatography (GC) technique with flame ionization detector. Methodology is defined by State of Alaska (ADEC 1999) as "Method for the Determination of Gasoline Range Organics" (GRO: AK101) and "Method for the Determination of Diesel Range Organics" (DRO: AK102).
- ♦ VOCs are assessed by GC/mass spectrometry (GC/MS) technique and EPA SW-846 Method 8260B.
- ♦ SVOCs are assessed by GC/MS technique and EPA SW-846 (1996) Method 8270C.

- ◆ Organochlorine pesticides are assessed by EPA SW-846 Method 8081A, a GC technique with electron capture detection (ECD).
- ◆ Polychlorinated biphenyls (PCBs) are assessed by EPA SW-846 Method 8082, a GC technique with ECD.
- ◆ Chlorinated herbicides are analyzed by EPA SW-846 Method 8151A.
- ◆ RCRA metals are assessed by EPA SW-846 Methods 6010B and 7000 series analysis. Inductively coupled plasma spectroscopy, EPA Method 6010B, is employed to assess the target analytes of barium, arsenic, cadmium, chromium, selenium, silver, and lead. Analysis by cold vapor atomic absorption technique should be employed to assess the target analyte mercury by EPA SW-846 Method 7471A.

#### 4.5.3 Sample Containers and Sample Preservation

Sample collection summaries are provided on Tables 5 and 6 for the sample containers and volume, preservation requirements, and holding times for the water and soil/sediment analyses. Glass sample containers are "pre-cleaned" from the laboratory to EPA Protocol A specifications and obtained in sealed boxes verifying that level of integrity. Samples are adequately preserved to ensure their stability from collection in the field to laboratory analysis. Field personnel will ensure that necessary supplies, such as ice and coolers, are on hand to preserve the samples after collection. Holding time specifications are consistent with EPA (1986, 1994, 1996) and ADEC method requirements (1999).

**Table 5 Sample Containers, Sample Preservation, and Holding Times – Waters**

Parameter	Method	Sample Container Description*	Preservation	Maximum Holding Time
Volatile Organic Compounds	8260B	3 40-mL VOA Glass w/TLS	Cool to 4° C, HCl to pH<2	14 days
Gasoline Range Organics	AK101	3 40-mL VOA Glass w/TLS	Cool to 4° C, HCl to pH<2	14 days
Diesel Range Organics	AK102	2 1-liter Amber Glass w/TLC	Cool to 4° C HCl to pH<2	7 days to extraction 40 days to analysis
Semivolatile Organic Compounds	8270C	2 1-liter Amber Glass w/TLC	Cool to 4° C Keep Dark	7 days to extraction 40 days to analysis
Polychlorinated Biphenyls	8082	2 1-liter Amber Glass w/TLC	Cool to 4° C	7 days to extraction 40 days to analysis
Organochlorine Pesticides	8081A	2 1-liter Amber Glass w/TLC	Cool to 4° C	7 days to extraction 40 days to analysis

**Table 5 Sample Containers, Sample Preservation, and Holding Times – Waters (continued)**

Parameter	Methods	Sample Container Description*	Preservation of Sample	Maximum Holding Time
Chlorinated Herbicides	8151A	2 1-liter Amber Glass w/TLC	Cool to 4° C	7 days to extraction 40 days to analysis
Metals (RCRA)	6010B/7000	500 mL HDPE	Cool to 4° C HNO <sub>3</sub> to pH<2	180 days Hg 28 days

\* For Matrix Spike/Matrix Spike Duplicate Samples: For aqueous samples, collect triple the volume listed.

HCl = Hydrochloric acid

HDPE = high density polyethylene

Hg = Mercury

HNO<sub>3</sub> = Nitric acid

ML = milliliter

TLC = Teflon-lined cap

TLS = Teflon-lined septa

VOA = Volatile organic analysis

**Table 6 Sample Containers, Sample Preservation, and Holding Times – Sediment**

Parameter	Methods	Sample Container Description*	Preservation	Maximum Holding Time
Volatile Organic Compounds	5035/8260B (high concentration)	4 oz. WM Glass w/TLS	Field Preservation 25 mL methanol for 25 g of sample, Cool to 4° C	14 days to analysis
Gasoline Range Organics	AK101	4 oz. WM Glass w/TLS	Field Preservation 25 mL methanol for 25 g of sample, <sup>†</sup> Cool < 25°C	28 days to analysis
Diesel Range Organics	AK102	8 oz. WM Amber Glass w/TLC	Cool to 4° C	14 days to extraction 40 days to analysis
Semivolatile Organic Compounds	8270C	8 oz. WM Amber Glass w/TLC	Cool to 4° C Keep Dark	14 days to extraction 40 days to analysis
Organochlorine Pesticides	8081A	8 oz. WM Glass w/TLC	Cool to 4° C	14 days to extraction 40 days to analysis
Polychlorinated Biphenyls	8082	8 oz. WM Glass w/TLC	Cool to 4° C	14 days to extraction 40 days to analysis
Chlorinated Herbicides	8151A	8 oz. WM Glass w/TLC	Cool to 4° C	14 days to extraction 40 days to analysis
Metals (RCRA)	6010B/7000	8 oz. WM Glass w/TLC	Cool to 4° C	180 days Mercury (28 days)

\* For Matrix Spike/Matrix Spike Duplicate Samples: For soil samples, no additional samples/containers need to be collected if project sample is completely full per sample container description.

† Soil samples being submitted for either gasoline range organic or volatile organic compound analysis must be accompanied by a separate jar of soil (not extracted with methanol) that can be used to determine percent moisture. If samples being submitted for gasoline range organic or volatile organic compound analysis are also being submitted for diesel range organic analysis, the percent moisture can be determined from the aliquot for the diesel range organic analysis.

Soil containers for volatile organic compound and gasoline range organic analyses are pre-tared at the laboratory for weight determination.

Gasoline range organic methanol solution will be designated to contain a field surrogate (trifluorotoluene or bromofluorobenzene compound).

TLC = Teflon-lined septa

TLS = Teflon-lined septa

WM = Wide-mouth

VOA = Volatile organic analysis

## **5.0 WASTE DISPOSAL PLAN**

This Waste Disposal Plan addresses the disposal of the various wastes produced by the FTW IDW treatment system. The plan outlines disposal procedures for the potential wastes, identified previously by the means currently in place and should be viewed as dynamic, based upon changing regulations and available waste disposal alternatives. There are a variety of disposal options currently available for POL-contaminated waste that may require this plan to be modified based on the direction of FTW's waste management program.

### **5.1 Treatment System Wastewater Effluent**

The procedures for sampling effluent from the liquid IDW treatment system to ensure adequate system performance are detailed in Section 4.0, Sampling and Analysis Plan. Sampling results will be reviewed by the treatment facility operator, submitted to GHU for authorization to discharge, and discharged to the sewer system. Additionally, all liquid IDW designated for treatment must meet the acceptance criteria specified in Section 3.1 to ensure optimum system performance.

### **5.2 Treatment Tank and Receiving Trench Sludge and Spent Treatment Media**

Tank sludge will be removed from the tanks and containerized in drums as described in the procedures detailed in Section 3.5.2.2. Each drum of sludge will be sampled and characterized for disposal per the sampling and analysis plan described in Section 4.0. Drums will be labeled as "Pending Analysis" (Appendix A) and temporarily stored in the IDW soil accumulation area located at Building 3476. Sludge IDW is disposed following the procedures for soil IDW.

### **5.3 Miscellaneous Solid Waste**

Used absorbent pads, spent particulate filters, and POL soiled material will be drummed together and turned in to the Hazardous Waste turn-in point operator for disposal. Miscellaneous non-regulated waste such as personal protective equipment and staging facility construction debris (e.g., visqueen, lumber, concrete, and piping) will be disposed of as a normal solid waste based

on the FTW DPW requirements. If large amounts of debris are expected to be generated, the placement of an on-site dumpster(s) must be requested from FW DPW, Environmental Resources Division. Empty drums that are clean but have been damaged and cannot be reused will be crushed and staged for disposal to the FTW landfill.

## **6.0 IDW MANAGEMENT OPERATIONAL PROCEDURES SUMMARY**

This section explains the procedures that generating contractors shall follow when turning in liquid or soil IDW waste into the IDW Management Area treatment facility.

### **6.1 Soil IDW**

Adhere to the following procedures when turning in soil IDW:

- ◆ IDW drums should not be filled more than 2/3 full.
- ◆ IDW soil should be placed in serviceable UN/ Performance Oriented Packaging (POP) approved and properly labeled drums and stored along the north side of the pavement area in the fenced yard outside Building 3476 while awaiting analytical results. Results should be submitted to the IDW facility operator and copied to FTW DPW Environmental Compliance Division.
- ◆ Fill out drop-off forms including the number of drums, the source of the soil, potential contaminants, expected date for receiving analytical results, and provide a map on the back of the form with the drop-off location in the yard identified.
- ◆ Empty drums for IDW soil are located inside the gate at Building 3476, along the fence in the southeast corner of the yard.

### **6.2 Liquid IDW**

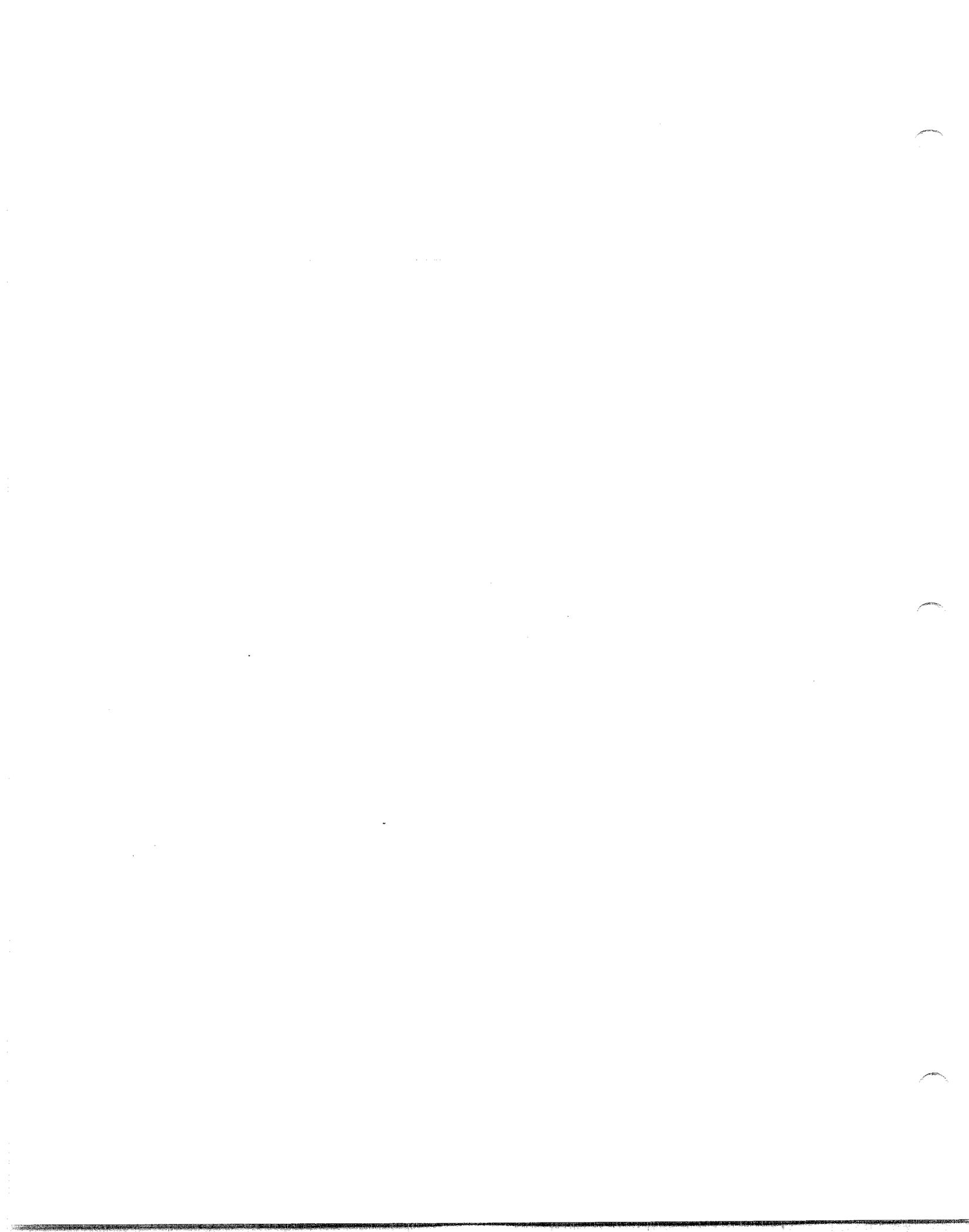
Adhere to the following procedures when turning in liquid IDW:

- ◆ Notify the IDW facility operator by phone at 907-277-5488 or fax at 907-277-5422 at least one week prior to generating or dropping off IDW water. Provide an estimate of the volume and dates planned for drop-off.
- ◆ Check out key for Building 3489 from DPW Building 3023 (Kate Siftar 907-353-6249). The gate lock combination will also be provided. Keys to Building 3476 will be assigned on a case-by-case basis.
- ◆ Only water potentially contaminated with POL compounds can be accepted. Raw product or RCRA compounds will not be accepted. Notify FTW DPW Environmental Compliance Division for direction or call North Wind with questions.
- ◆ Water with floating product or sheen will be considered on a case-by-case basis.
- ◆ IDW water potentially contaminated with RCRA compounds must be placed in serviceable UN/POP approved and properly labeled drums and stored inside Building

3476 while awaiting analytical results. Results should be submitted to the IDW facility operator and copied to FTW DPW Environmental Compliance Division.

- ◆ Drums for IDW water are located inside the gate to Building 3476, along the fence located in the southeast corner of the yard.
- ◆ Dump IDW water in the floor sump of Building 3489 IDW water treatment facility. If sump is more than  $\frac{3}{4}$  full, pump excess into the available 225-gallon overflow tank or open-top drums to allow room for drillers to decontaminate their equipment. Do not attempt to operate treatment system or pump into 2,500-gallon settling tank.
- ◆ Report any problems such as no heat, leaks, broken equipment, congested areas, clutter or messes, etc. to the IDW facility operator.
- ◆ Complete drop-off form including the condition of the facility and name of the person delivering the water before leaving. Make sure that the facility is clean and ready for the next user, that the garage door closes completely and that the personnel doors are locked.
- ◆ Write “decon only” on drop-off forms if applicable, and note facility condition before and after use.

**APPENDIX A**  
**LABELS AND FORMS**



# INVESTIGATIVE DERIVED WASTE

**REGULATED UNDER DERP**

WASTE MGT. PLAN: \_\_\_\_\_  
PROJECT: \_\_\_\_\_  
LOCATION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
BORING NO.: \_\_\_\_\_  
DEPTH: \_\_\_\_\_  
MATERIAL TYPE:  SOIL  WATER OTHER \_\_\_\_\_  
CONTRACT NO.: \_\_\_\_\_  
COMPANY: \_\_\_\_\_  
CONTACT: \_\_\_\_\_  
TELE. NO.: \_\_\_\_\_  
NOTE: \_\_\_\_\_

# NON-REGULATED WASTE

THIS WASTE IS NOT  
REGULATED BY  
THE US  
ENVIRONMENTAL  
PROTECTION


## NON-REGULATED WASTE

# IDW WATER/SOIL DERA TEMPORARY STORAGE DROP-OFF FORM

- A. CONTRACTOR NAME, CONTRACT NO./DELIVERY ORDER NO.: \_\_\_\_\_  
\_\_\_\_\_
- B. PERSON DROPPING IDW OFF: \_\_\_\_\_
- C. COE POC: \_\_\_\_\_
- D. IDW WATER DRUM COUNT OR APPROXIMATE VOLUME: \_\_\_\_\_
- E. IDW SOIL DRUM COUNT: \_\_\_\_\_
- F. IDW ORIGIN (PHYSICAL LOCATION)/DATE: \_\_\_\_\_
- C. UNIQUE IDW DRUM IDENTIFICATION NOS.: \_\_\_\_\_ TO: \_\_\_\_\_
- D. SAMPLE DATE: \_\_\_\_\_ TEST METHODS: \_\_\_\_\_
- G. DATE RESULTS ARE EXPECTED: \_\_\_\_\_
- H. PROPOSED DISPOSAL MECHANISM (i.e., Landfill, Carbon Treatment, etc.): \_\_\_\_\_  
\_\_\_\_\_
- I. CONTRACTOR PROJECT MANAGER: \_\_\_\_\_
- J. TEMPORARY STORAGE LOCATION (see map on back of form): \_\_\_\_\_

## SIGNATURES FOR TEMPORARY STORAGE LOCATION:

\_\_\_\_\_  
DPW, FWA REPRESENTATIVE  
(print)

\_\_\_\_\_  
CONTRACTOR REPRESENTATIVE  
(print)

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
SIGNATURE

DATE: \_\_\_\_\_

Title

Date

Dwg.

Project

Proposal

Chippawa Road

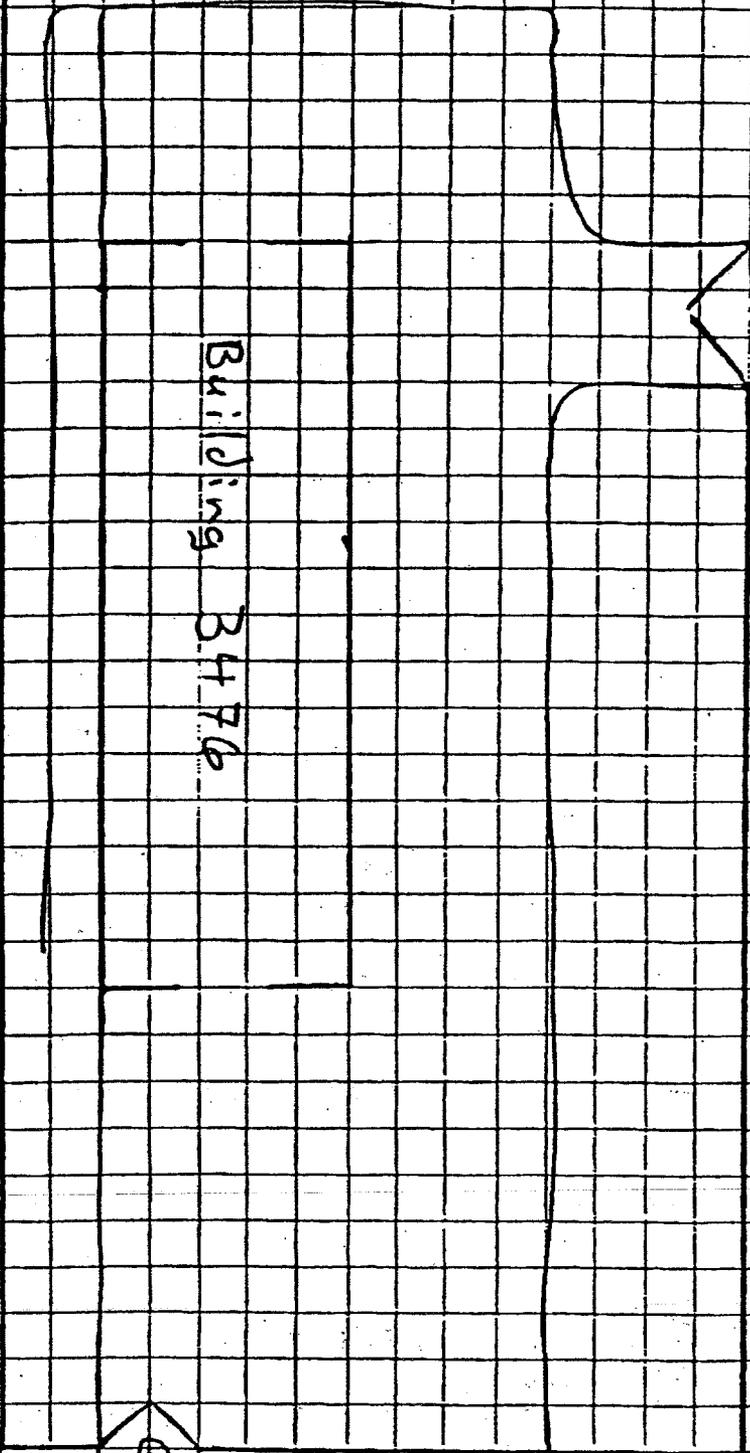
30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

GATE

Building 3476

GATE

NORTH



**APPENDIX B**  
**MANUFACTURERS' CUT SHEETS**



SDC  
DRUM CRUSHER/IN-DRUM COMPACTOR

OWNER'S MANUAL

This manual has been written to help you obtain maximum benefits from your Drum Crusher/In-Drum Compactor. Please read it thoroughly, save it for future reference and call us for assistance if required.

**WARNING: THIS MACHINE IS POTENTIALLY DANGEROUS IF NOT INSTALLED AND OPERATED IN ACCORDANCE WITH THIS MANUAL.**

**NOTICE:** Please read this manual thoroughly, date, sign and return the acknowledgement form on the following page to:

Benko Products, Inc.  
24500 Center Ridge Rd. Ste. 200  
Westlake, OH 44145

Benko Products will then forward official title to this equipment and acknowledgement of warranty to save for your records.

**BENKO PRODUCTS, INC.**

**SDC**

**SERIAL NO.** \_\_\_\_\_

**TRANSFER OF TITLE  
AND  
WARRANTEE REGISTRATION**

I/We have read and understand the contents of the attached manual  
for this machine.

by \_\_\_\_\_

title \_\_\_\_\_

date \_\_\_\_\_

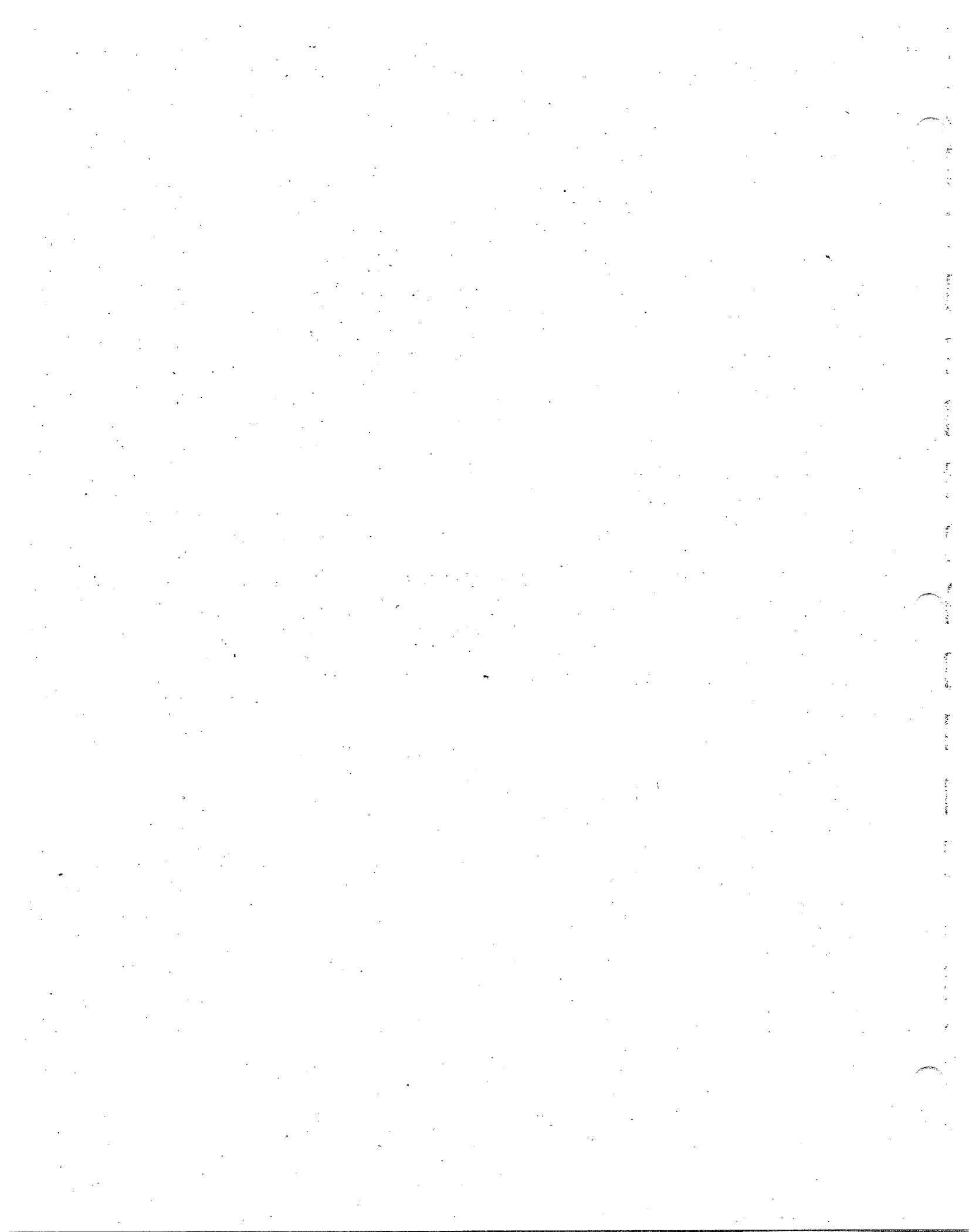
**WITNESSED**

by \_\_\_\_\_

title \_\_\_\_\_

date \_\_\_\_\_

**EXHIBIT 3.1**  
**CATALOG CUTS**



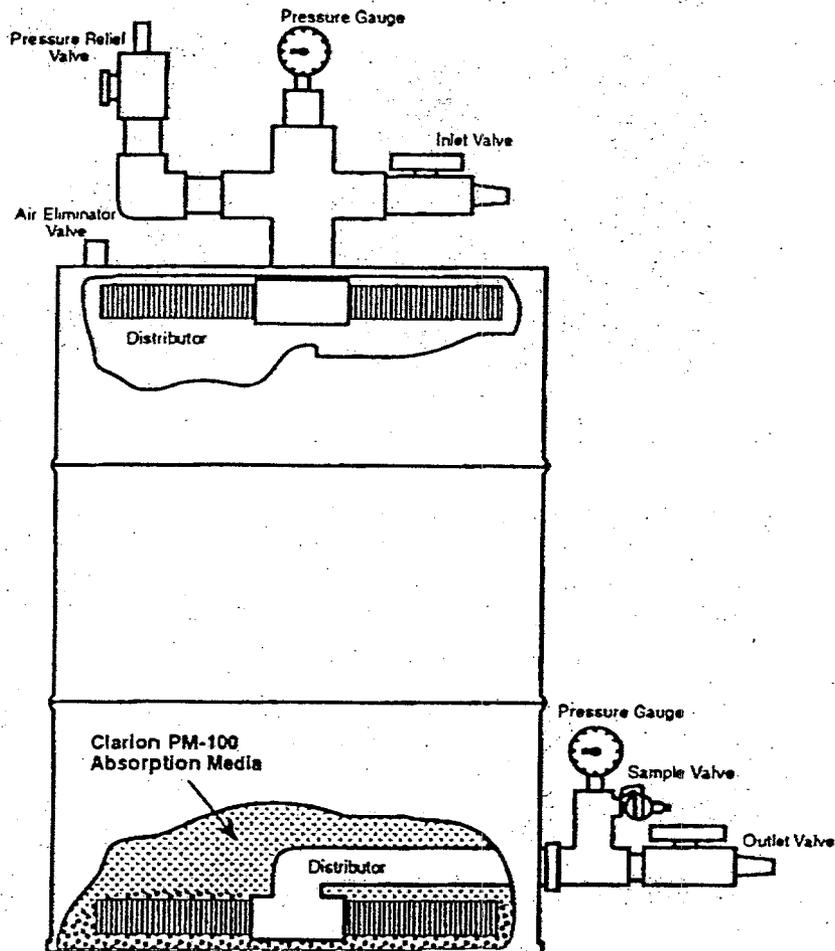


COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY

ALASKA PUMP & SUPPLY INC.  
261 East 56th Avenue  
ANCHORAGE, ALASKA 99518  
(907) 563-3424 FAX: (907) 562-8449

TECHNICAL DATA SHEET

# An Introduction to CLARION



## CETCO's New Surface Modified Clay Groundwater and Wastewater Treatment Technology

1500 W. Shure Drive • Arlington Heights, Illinois 60004-7803 • (708) 392-5800 • Telex ITT 4330321 • FAX (708) 506-6150

A wholly owned subsidiary of American Colloid Company

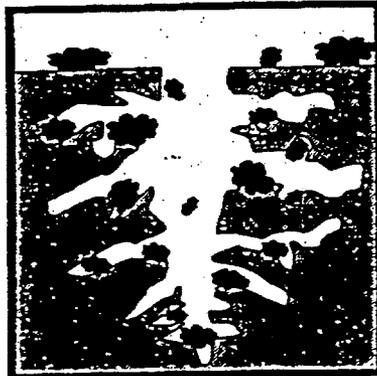
The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

# Clarion PM-100

Sorption Technology of PM-100

The PM-100 technology is a unique approach to sorption of organics from water. However, it differs from activated carbon in the mechanism of sorption. In Figure 1, activated carbon adsorbs organics through a surface area related mechanism. PM-100 operates through a partitioning phenomenon that has little relationship to surface area. Higher molecular weight organics, such as humic substances, tend to foul activated carbon by blinding the pore structure of carbon and lowering the available surface area for adsorption, resulting in loss of capacity.

Figure 1



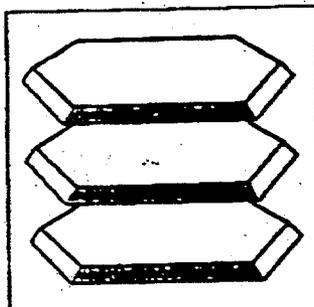
Cross Section of Activated Carbon



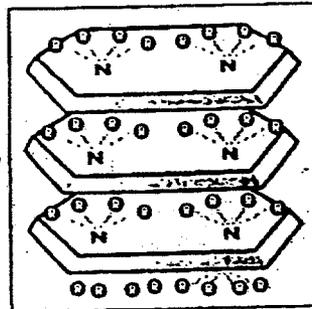
Blinding of Activated Carbon Pore Spaces

As illustrated in Figure 2, the surfaces of the clay platelets in PM-100 are chemically modified, rendering the clay completely hydrophobic. The modified platelets only have an affinity for organics. As the higher molecular weight organics are absorbed, the platelets spread further apart. This phenomenon gives PM-100 a very high absorption capacity relative to activated carbon. PM-100 can also be regenerated with a caustic backwash thereby extending bedlife.

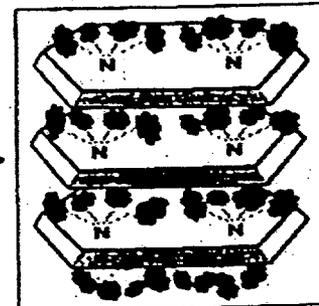
Figure 2



Individual Stack of Expandable Clay Crystals



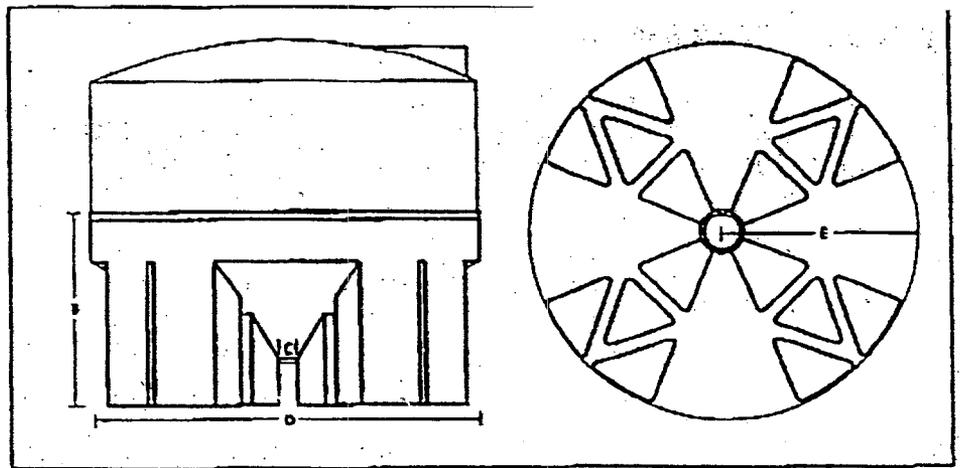
Clay Surface Modified with Quaternary Amine



Saturation of Organoclay with Contaminants

## POLYETHYLENE CONE BOTTOM STANDS

Maintenance free, lightweight NORWESCO polyethylene stands offer unequalled corrosion resistance.



Tank Size (gallon)

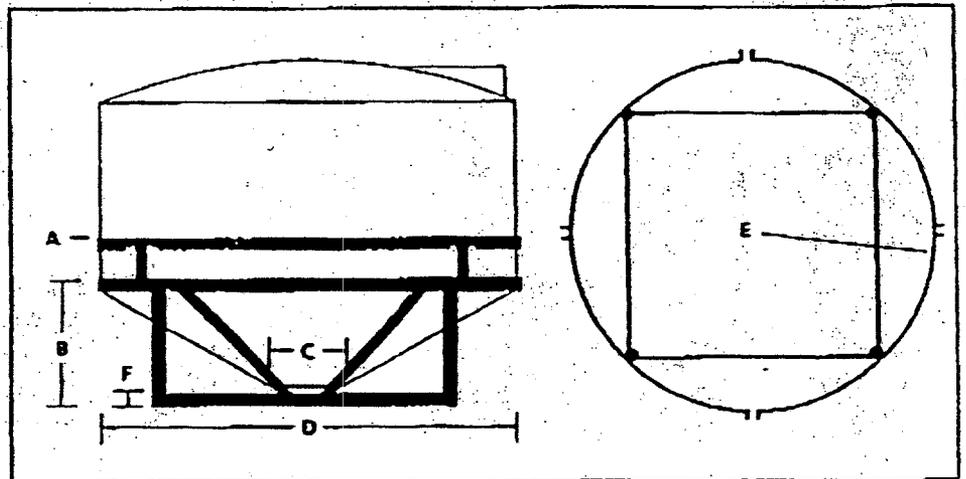
A B C D E

## POLYETHYLENE CONE BOTTOM STANDS

175	—	31-1/2"	8"	42"	21"
500	—	32"	8"	48-5/8"	24-5/16"
1050	—	34"	10"	72-5/8"	36-5/16"
1550	—	46"	10"	88"	44"
1650/2500	—	47"	10"	97-1/2"	48-3/4"

## HEAVY DUTY CONE BOTTOM STANDS

NORWESCO heavy duty stands are manufactured from structural steel and offer a full dish for uniform support. Finished with gloss blue paint. An optional top band is available for the 1650/2500/3000 steel stand when additional support is needed.



Tank Size (gallon)

A B C D E F Part No.

## HEAVY DUTY CONE BOTTOM STANDS

1650/2500/3000	—	36"	11"	96"	48"	11"	60059
5500	—	45"	11"	120"	60"	12"	60358
7500	—	49"	11"	142"	71"	11"	61860
1650/2500/3000	Optional Top Band Assembly	—	—	—	—	—	60359

## CONE BOTTOM TANKS

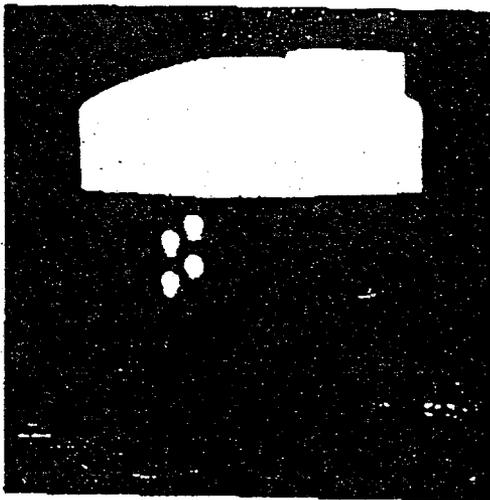
Designed for a variety of applications, NORWESCO offers a full range of cone bottom tanks. The conical bottoms enable quick and complete drainage. As with all NORWESCO tanks, the cone bottom tanks are molded of rugged, high-density polyethylene and are both impact and chemical resistant. Please refer to page 8 for poly or steel stands.

Gallon Capacity	Diameter	Height	Slope	Fill Opening	Outlet/Drain Specification	Premium Weight	Heavy Weight
						Part No. White	Part No. Blue
* 175 w/ stand	42"	49"/10"†	30°	8"	2"	60113	—
* 500 w/ stand	48"	85"/9"†	30°	16"	2"	40289	—
1050	72"	74"	20°	16"	2"	40356	—
* 1050 w/ stand	72"	85"/11"†	20°	16"	2"	40359	—
1550	88"	80"	30°	16"	2"	40412	—
* 1550 w/ stand	88"	91"/11"†	30°	16"	2"	40414	—
1650	95"	77"	30°	16"	2"	40082	40127
* 1650 w/ stand	95"	87"/10"†	30°	16"	2"	40670	40676
2500	95"	104"	30°	16"	2"	40066	40129
* 2500 w/ stand	95"	114"/10"†	30°	16"	2"	40672	40674
3000	95"	121"	30°	16"	2"	40170	40172
5500	118"	146"	30°	16"	3"/2"	40549	40316
7500	141"	149"	30°	16"	3"/2"	40551	40409

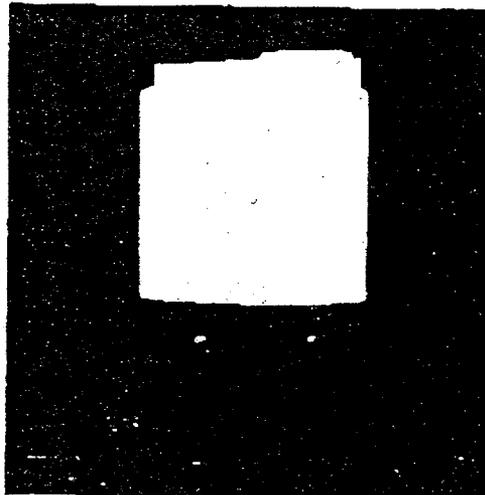


\* Polyethylene stand

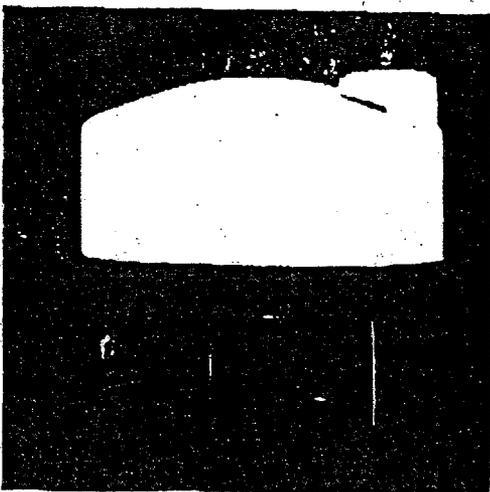
† Distance from bottom of cone to ground



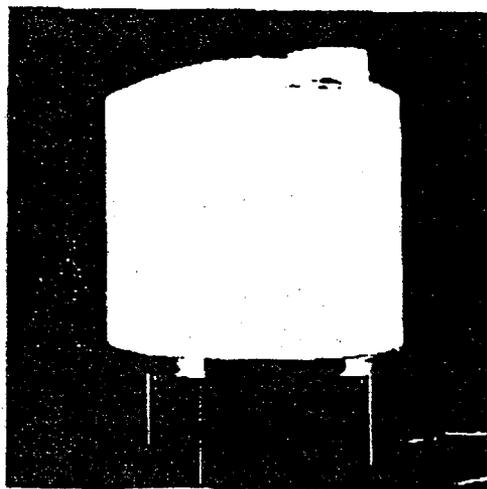
175 Gallon



500 Gallon



1550 Gallon



3,000 Gallon

PLEASE NOTE: Tank availability may vary according to manufacturing location. Please contact Norwesco Customer Service or your Norwesco distributor for specific details.

# IDW WATER/SOIL DERA TEMPORARY STORAGE DROP-OFF FORM

- A. CONTRACTOR NAME, CONTRACT NO./DELIVERY ORDER NO.: \_\_\_\_\_  
\_\_\_\_\_
- B. PERSON DROPPING IDW OFF: \_\_\_\_\_
- C. COE POC: \_\_\_\_\_
- D. IDW WATER DRUM COUNT OR APPROXIMATE VOLUME: \_\_\_\_\_
- E. IDW SOIL DRUM COUNT: \_\_\_\_\_
- F. IDW ORIGIN (PHYSICAL LOCATION)/DATE: \_\_\_\_\_
- C. UNIQUE IDW DRUM IDENTIFICATION NOS.: \_\_\_\_\_ TO: \_\_\_\_\_
- D. SAMPLE DATE: \_\_\_\_\_ TEST METHODS: \_\_\_\_\_
- G. DATE RESULTS ARE EXPECTED: \_\_\_\_\_
- H. PROPOSED DISPOSAL MECHANISM (i.e., Landfill, Carbon Treatment, etc.): \_\_\_\_\_  
\_\_\_\_\_
- I. CONTRACTOR PROJECT MANAGER: \_\_\_\_\_
- J. TEMPORARY STORAGE LOCATION (see map on back of form): \_\_\_\_\_

## SIGNATURES FOR TEMPORARY STORAGE LOCATION:

\_\_\_\_\_  
DPW, FWA REPRESENTATIVE  
(print)

\_\_\_\_\_  
CONTRACTOR REPRESENTATIVE  
(print)

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
SIGNATURE

DATE: \_\_\_\_\_

Chippawa Road

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

GATE

Building 3476

GATE

NORTH



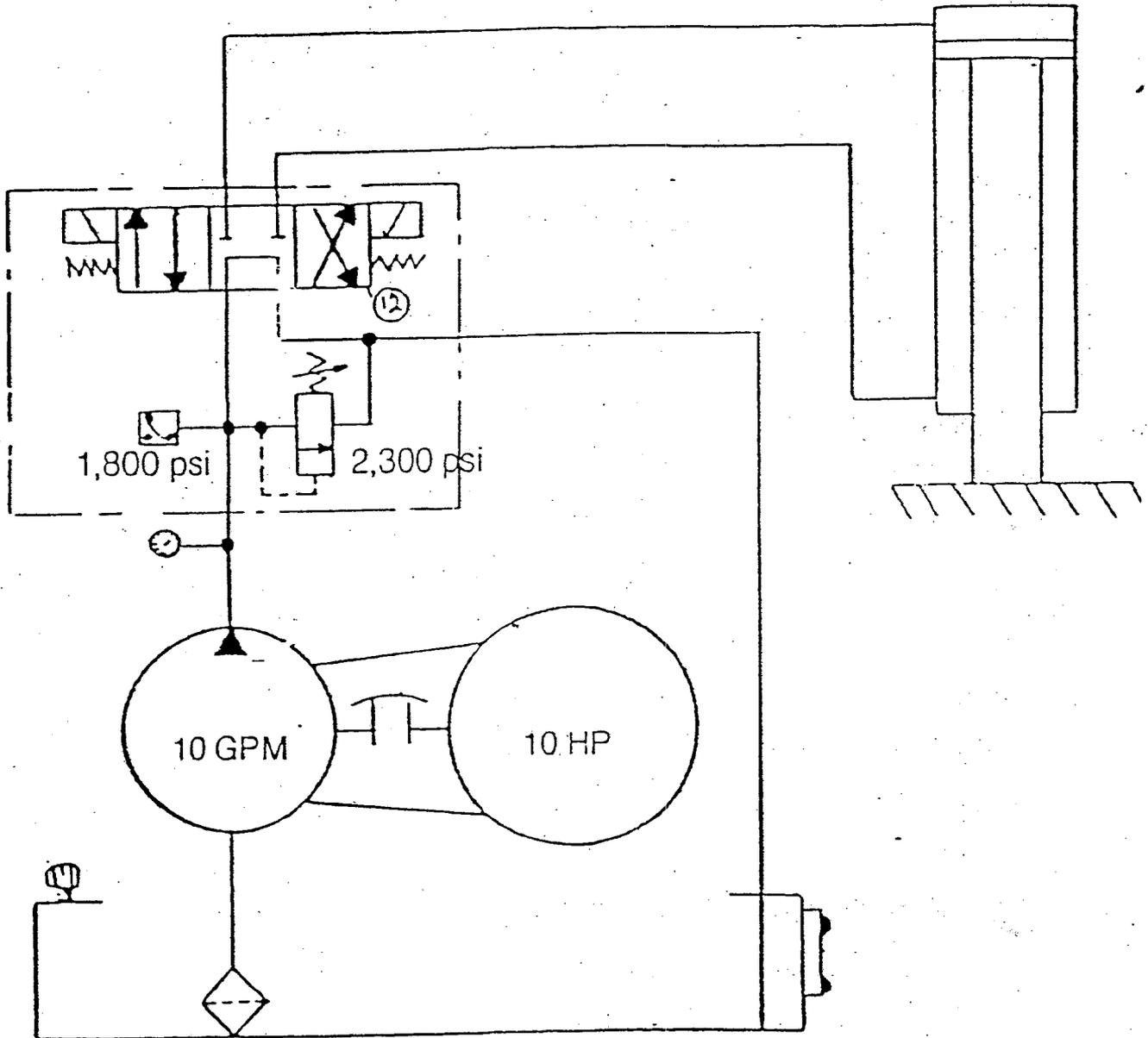
**EXHIBIT 3.3**

**GOLDEN HEART UTILITIES  
SPECIAL WASTEWATER DISCHARGE PERMIT**

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Handwritten text, possibly initials or a date, located at the bottom right of the page.

# HYDRAULIC SCHEMATIC DIAGRAM

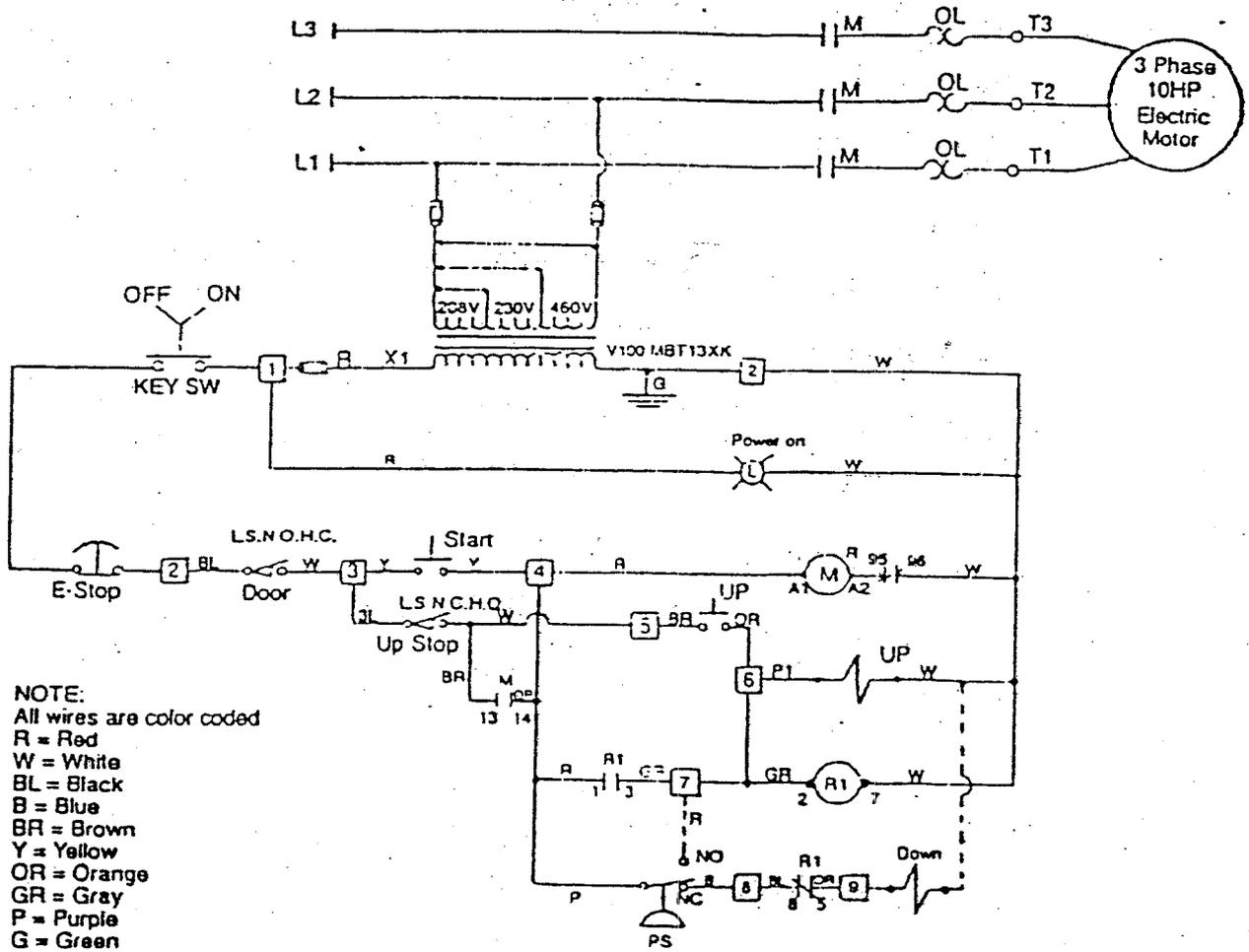


# HYDRAULIC NOMENCLATURE

<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>Q/P</u>	<u>UOM</u>
Adaptor, Pump	F2A	1	ea.
Breather, Air	BF 2013/3/4"	1	ea.
Filter, Suction	F8-100	1	ea.
Gauge, Pressure	002-SSG2512-3K	1	ea.
Gauge, Sight Level	HSG-55	1	ea.
Motor, 10HP	CM 7170T	1	ea.
Pump, 10 GPM	V10-1P7P	1	ea.
Subplate	D02	1	ea.
Switch, Pressure	C9612-3-CS	1	ea.
Tank	DC-155	1	ea.
Valve, Directional	SS-G03-C7Y	1	ea.
Valve, Relief	RV5-10-S-0-35/1	1	ea.

NOTICE: This parts list does not include hydraulic fittings, hydraulic hoses and misc. parts.

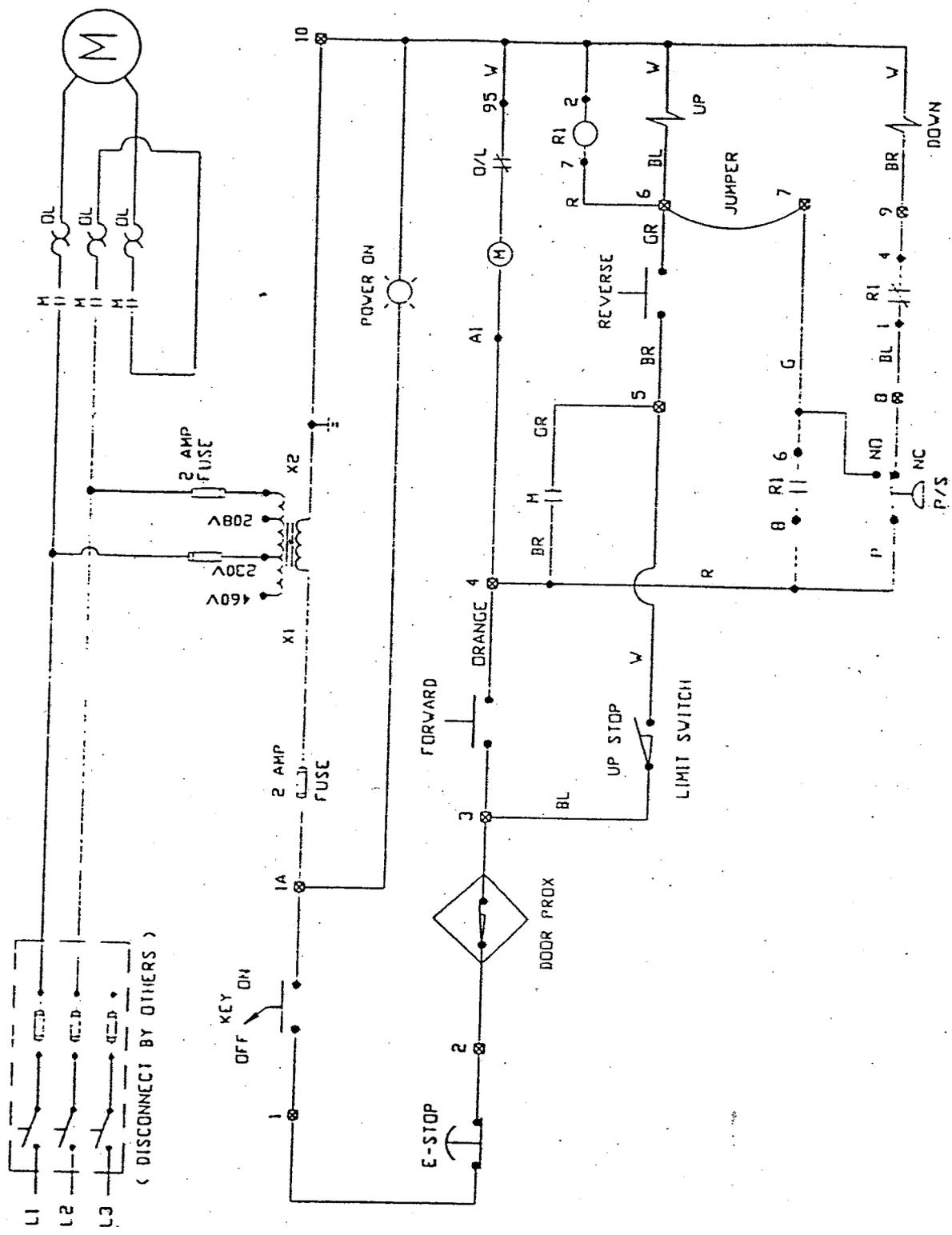
# ELECTRICAL SCHEMATIC DIAGRAM



## ELECTRICAL NOMENCLATURE

<u>Description</u>	<u>Part Number</u>	<u>Q/P</u>	<u>UCM</u>
Box, Control	PBHC 14126 JIC4	1	ea.
Box, Junction	PBHC 664 JIC4	1	ea.
Button/E-Stop	9001 KR9R/KA3	1	ea.
Button/Key Select	9001 KS11K1/KA2	1	ea.
Button/Start	9001 K1L1G/KA2	1	ea.
Button/Up	9001 KR1U/KA2	1	ea.
Starter, Motor	F35-AC (20V-, 16/20)	1	ea.
Switch, Proximity	125-7Y-46K	1	ea.
Switch, Limit	ZCK L1/ZCK G00/Y43	1	ea.
Transformer	9070 K100D20	1	ea.

NOTICE: This parts list does not include S/T conduit, SO cord,  
and misc. parts.



ELECTRIC SCHEMATIC

CAD DWG HE05166

NO.	REVISIONS CHANGE	DATE
1		

  
 HYDROLEC LIMITED  
 5018 STOP AVE.  
 JACKSONVILLE, FLORIDA 32218  
 PHONE 1-904-730-2700  
 FAX 1-904-730-2773

CUSTOMER		<b>CIVES</b>	
TITLE: 5HP EXPLOSION PROOF MOTOR SINGLE PHASE			
DATE	04/27/95	MODEL NO	HE-05166-S0
DWG BY	ZELIMIR H.	APP BY	
SHEET		1 OF 1	



**SPECIFICATIONS  
SINGLE DRUM CRUSHER**

ELECTRIC MOTOR	10 H.P. - T.E.F.C.
CYCLE (HZ)	60 HZ
PHASE	3
VOLTAGE	208/240/480
COMPACTING FORCE	60,759 LBS.
CYLINDER BORE	6" DIAMETER
CYLINDER ROD	4" DIAMETER
CYLINDER STROKE	47"
DRUM CRUSHER WEIGHT	2500 LBS.
TIME OF CYCLE	42 SECONDS
FEED OPENING	30"W x 50"H x 30"D
MAXIMUM WIDTH	44"
MAXIMUM DEPTH	41-3/4"
MAXIMUM HEIGHT	118" (107" MIN. FOR SHIPPING)



## WARNING!

THIS MACHINE IS VERY DANGEROUS IF NOT OPERATED IN ACCORDANCE WITH THIS MANUAL OR OTHERWISE IMPROPERLY USED.

This equipment should only be operated by knowledgeable personnel who have read and understand the contents of this manual fully and have been trained and approved by experienced personnel.

All operating personnel must be eighteen (18) years of age or over.

Never stand in front of machine while it is crushing or compacting.

The machine must never be operated with the door open.

The machine is equipped with an automatic safety switch that stops it from cycling when the door is ajar or open by any amount. If not, it must be made fully inoperable by switching the power off at the machine and at the main facility power source. Call your local qualified service agent.

THIS MACHINE IS NOT FULLY EXPLOSION PROOF REGARDLESS OF WHETHER OR NOT IT IS EQUIPPED WITH AN EXPLOSION PROOF MOTOR.

This machine must never be used to crush or in/drum compact objects that contain explosive liquid or vapors or other materials made of explosive nature.

This equipment must never be operated in or around explosive vapor and/or liquid areas.

The machine must never be operated in wet conditions.

The machine must never be left unattended unless it is first switched both at the machine and at the main facility power source and the key removed and put in custody of personnel who have read, are trained, and authorized to operate this equipment.

## WARNING!

The safety switches or any other parts of this machine must not be changed or modified without the written authorization of Benko Products, Inc.

The electrical connections must be fully grounded and made by a qualified and experienced electrician of long standing reputation.

When making any repairs whatsoever to this machine the power must first be disconnected at the facilities main power source as well as at the machine by a qualified electrician of long standing reputation.

The center of gravity of the machine is relatively high and therefore extreme caution should be exercised to secure and prevent it from tipping when unloading, transporting, and or operating it.

Operating personnel must be warned not to bump or ram into it to shift or tip it over.

NEVER REACH HANDS, ARMS OR ANY OTHER PART OF ONE'S BODY INTO THE CHAMBER SO AS TO BE UNDER THE PLATEN UNLESS THE POWER HAS BEEN TURNED OFF AT BOTH THE MACHINE AND AT THE FACILITY MAIN SOURCE.

Drums with materials compacted therein are generally very heavy and unstable, therefore CAUTION must be used when unloading and transporting them.

## INSTALLATION

### **CAUTION!**

Installation must be done by qualified experienced personnel to be sure the machine is handled safely and is properly installed and tested for safe and effective operation.

During installation, keep the area clear of unnecessary personnel.

Allow for 2500 lbs. of machine weight.

DO ALL STEPS IN THE ORDER GIVEN IN THIS MANUAL.

### RECEIVING THE CRUSHER

Before unloading, the machine should be checked for shipping damage. If such is observed bring same to the shipper's driver. Note and date same on the bill of lading and have driver acknowledge and sign for same.

If the machine is in good condition, remove exterior packing material and check the label on the control panel of machine frame to see if the voltage is correct for your power service. If not compatible notify your dealer or Benko Products, Inc. immediately.

### MOVING THE CRUSHER

**WARNING!** The machine has a relatively high center of gravity therefore extreme caution must be used when moving it so as not to tip it over.

### USING FORK LIFT TRUCK

Before lifting the SDC off the 4 x 4 hardwood pallet, remove the four bolts securing the SDC to the pallet. Open the door and position the forklift forks so they go into the two outermost channels in the base of the drum crusher. Tie or chain the unit to the lift truck to prevent it from rocking. Carefully lift the drum crusher off the pallet and place in it's desired location.

## INSTALLATION

**WARNING!** Under no condition should the crusher be lifted or transported with forks under the crusher body or base unless the machine is properly secured to the lift truck to prevent tipping. The unit should only be lifted high enough to clear the ground so as to keep it's center of gravity as low as possible. All transporting by lift truck should be at very low speed to prevent rocking of the crusher on the forks, and to avoid loss of control or tipping.

### PREPARING FOR STARTUP

Once the machine is in the desired location it should be shimmed level and securely anchor bolted with at least 1/2" bolts or larger to a concrete slab. The slab should be at least 6" thick and cover an area of at least 6 feet by 6 feet for stability.

Check sight gauge on the hydraulic oil reservoir to make sure oil is within 2" of the top. If not fill with Chevron OC32 hydraulic oil or oil of equivalent specifications. (Mineral oil base with anti-wear additives.)

Remove 3/4" pipe plug from fill plug, then screw in the breather cap located in the control panel.

Check all hydraulic fittings for tightness.

**WARNING!** Do not use one's body parts directly when checking for possible leaks for the system is under extreme pressure and can cause bodily injury.

Remove all packing materials and accessories that may be inside the machine.

**WARNING!** Only a qualified experienced electrician of long standing reputation should be allowed to perform electric work on this machine.

Verify that the main power source input voltage matches that of the machine's controls and transformer. If compatible, connect the power service to the machine. Power to the machine can now be verified if the green light of the start button is lighted. If not lighted there is no power to the machine. (Test to make sure this light is working and not burned out or other wise defective.)

## INSTALLATION

### RAISING THE CYLINDER

- In most cases, the machine is shipped with the cylinder lowered into the crushing chamber.
- If such is the case, the cylinder should only be raised to its operating position after the machine base has been shimmed and securely anchored to the firm concrete base.
- Remove all strapping and packing that may be holding the platen, cylinder, and/or hoses. DO NOT REMOVE ANY WOOD BLOCKING THAT SUPPORTS THE CRUSHING PLATEN.
- Check to see that the pump motor rotation is correct by JOGGING ONLY with the START and STOP buttons. JOG FOR ONLY 2 to 3 seconds at a time.
- Observe the pump/motor shaft rotation through the sight holes to see if the rotation is in the same direction as the indicating arrow. (Pump rotation should be clockwise when looking at the shaft end of the pump.) The cylinder will rise if the rotation is correct.
- If the rotation is incorrect, disconnect power at the machine and also at the facilities main source and reverse any two wires on the load side of the disconnect switch.

**WARNING!** Reminder - any and all such electrical work should only be done by a qualified electrician of long standing experience.

- Jog the pump motor by pushing the START and STOP buttons and observe that the cylinder will start to rise.
- Make sure all cylinder hoses are free of obstructions and can move freely with the cylinder.

## INSTALLATION

Continue to jog the cylinder up, guiding it so that hoses and fittings clear the crown area.

Install bolts and lock washers when the cylinder is properly aligned and in place. Torque bolts to 100 foot pounds.

Raise the platen slightly by using the UP/LJEC1 and STOP buttons per instructions on page 12 herein. Remove all cribbing material that is below the platen.

Cycle the platen all the way up and once again check the oil level. Fill to a level 2" from the top of the reservoir if required.

Check and secure all mechanical fasteners. Clear away all debris from in and around the machine.

Read and understand control button functions on page 12 and then make a complete cycle, checking all safety switches and push buttons.

**CAUTION!** Check to make sure that the machine will not operate unless the door is closed. Also see to it that the emergency stop button is operational by pressing it in and stopping the machine. If any of these safety features do not operate properly turn the power off at both the machine and the main power source and notify your dealer

# CONTROL BUTTONS AND THEIR FUNCTIONS

(FROM TOP DOWN)

## KEY

(Switch)

When turned to the left most position and removed the machine will not operate. When the key is turned to the right most position the AUTO/START button will light and the machine can be operated as follows.

## AUTO/START

(Green Button)

When the GREEN button on control box is lighted, it indicates there is power to the machine. When pressed the machine will start, platen will travel DOWN and reach it's bottom limit, pause, automatically reverse and travel UP to its top limit, and stop.

## UP

(Yellow Button)

YELLOW button on control box when being pressed will raise the platen up manually from any down position. To use this function the platen must first be stopped by pushing in the red stop button and pulling it out again.

## STOP

(Red Button)

Large RED button on control box. When pressed (locked) in, the machine will stop instantly with platen at any position. Pull out to unlock it thus allowing use of other buttons functions once again.

## REMINDER:

Door must be closed for the machine to operate.

## DRUM CRUSHING PROCEDURE

- 1) Make sure the round 1" thick drum platen (crushing) plate is securely bolted to the compacting head above it.
- 2) Push the RED stop button to make sure the machine will not cycle while loading it.  
It is preferable to disconnect the power to the machine at the main facility source.
- 3) Open the door.
- 4) Remove the drum's top fill cap or punch a hole in the top of the drum.
- 5) Place the drum centered on top of the 1/2" thick centering pallet plate on the base.  
Center the fill or punched hole under the hole in the platen (crushing) plate to allow air to escape during crushing.
- 6) Close the door.

**WARNING: MAKE SURE THE DRUM DOES NOT CONTAIN EXPLOSIVE VOLITALE LIQUIDS OR VAPORS.**

- 7) Make sure there are no explosive liquids or vapors in the area.
- 8) Stand to the control panel side of the machine making sure there are no personnel in front of the door.
- 9) Pull out the RED emergency stop button and then push the GREEN lighted start button.
- 10) The machine will automatically and slowly crush the drum to within 4" to 6" of the bottom depending on the gauge of the drum and return to the top and stop.
- 11) Push in the RED emergency stop button (preferably disconnect the power at the main facility switch).
- 12) Open the door.
- 13) Remove the crushed drum.

### WARNING

**DO NOT LEAVE MACHINE UNATTENDED WITHOUT TURNING OFF POWER BOTH AT THE MACHINE AND AT THE MAIN FACILITY POWER SOURCE.**

**REMOVE THE KEY AND PUT IN CUSTODY OF PERSONNEL WHO HAVE READ, ARE TRAINED, AND AUTHORIZED TO OPERATE THE EQUIPMENT.**

## IN-DRUM COMPACTING PROCEDURE

- 1) When in its lowest position and supported on blocking or a fork lift, unbolt and remove the round 1" thick drum platen (crushing) plate from the compacting head above it.
- 2) Push the RED stop button to make sure the machine will not cycle while loading it.  
It is preferable also to disconnect the power to the machine at the main facility source.
- 3) Open the door.
- 4) Place an open top drum centered over the round 1/2" thick centering pallet plate on the base.

**WARNING: MAKE SURE THE DRUM OR ITEMS TO BE COMPACTED THEREIN DO NOT CONTAIN OR HAVE EXPLOSIVE VOLATILE LIQUIDS OR VAPORS IN OR ON THEM.**

- 5) Load the drum with items to be compacted.
- 6) Close the door.
- 7) Make sure there are no explosive liquids or vapors in the area.
- 8) Stand to the control panel side of the machine making sure there are no personnel in front of the door.
- 9) Pull out the RED emergency stop button and then push the GREEN lighted start button.
- 10) The machine will automatically and slowly down stroke and compact the contents and return to the top and stop.
- 11) Repeat Steps 2, 3, 5, 6, 7, 8, 9 until the drum is as full of compacted materials as desired. Materials should not be overflowing the top of the drum.

## IN-DRUM COMPACTING PROCEDURE

- 12) It is preferable to remove a heavily compacted drum with a forklift device by inserting it's forks into the two removable channel slots underneath the round 1/2" centering pallet. Lift slightly and back out the pallet with the drum on it clear and free of the crusher.

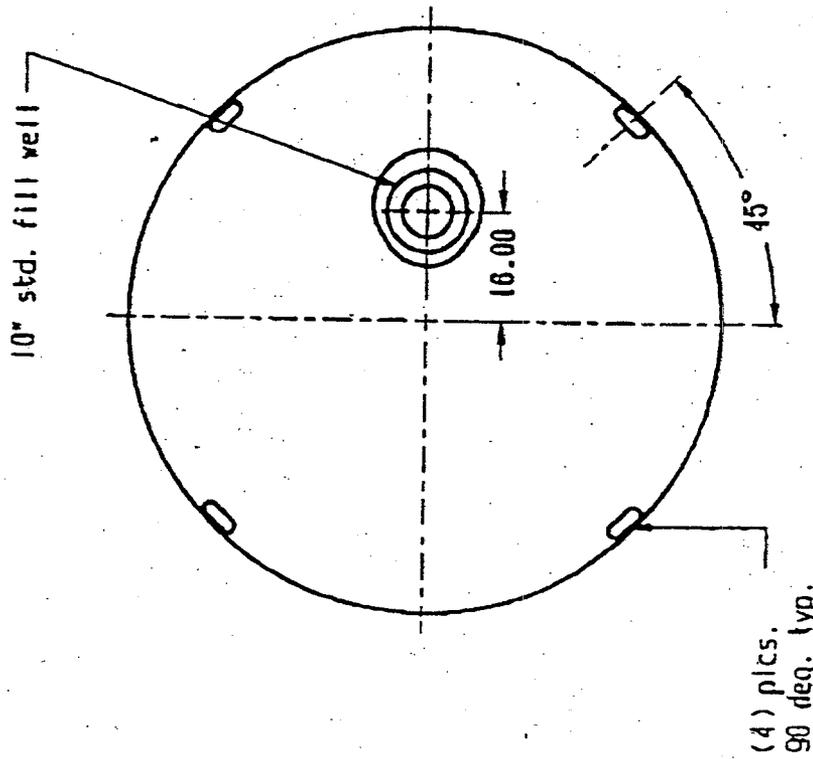
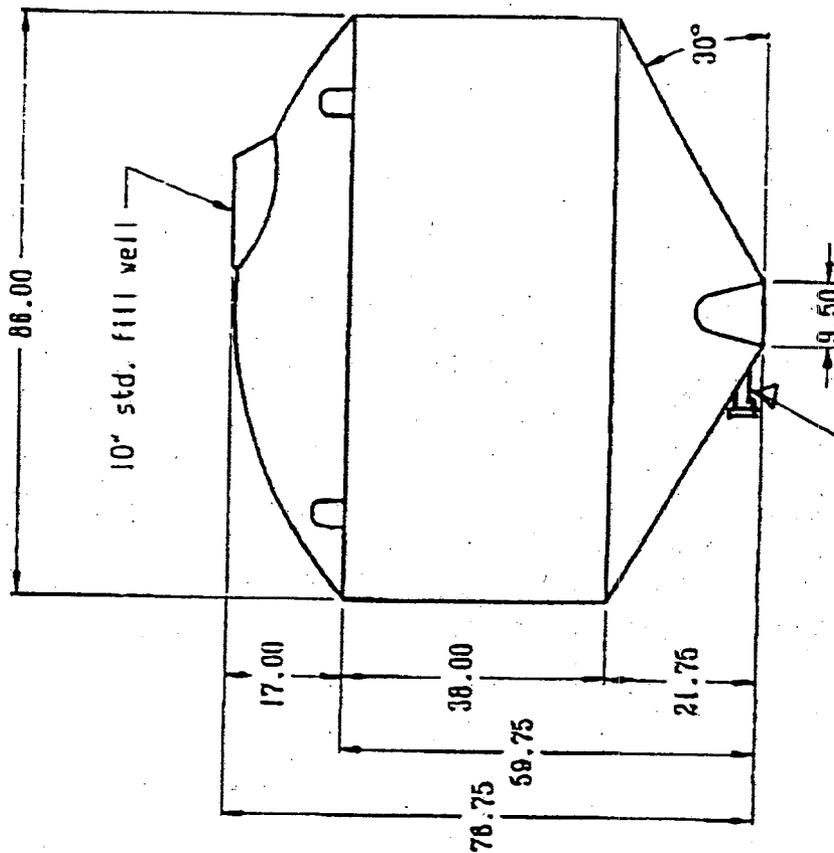
**WARNING: A HEAVILY COMPACTED DRUM CAN BE VERY UNSTABLE WHEN NOT HANDLED PROPERLY, ESPECIALLY WHEN TRANSPORTING WITH A FORK LIFT DEVICE. FOR SAFETY, TIE OR OTHERWISE SECURE THE DRUM TO THE FORK LIFT SO IT WILL NOT TIP OFF THE FORK LIFT. TRAVEL SLOWLY AND ONLY OVER LEVEL GROUND.**

- 13) Place the compacted drum on 4 x 4 wood blocking placed each side of the 1/2" removable pallet plate and lower the pallet cut and from underneath the drum.

### WARNING

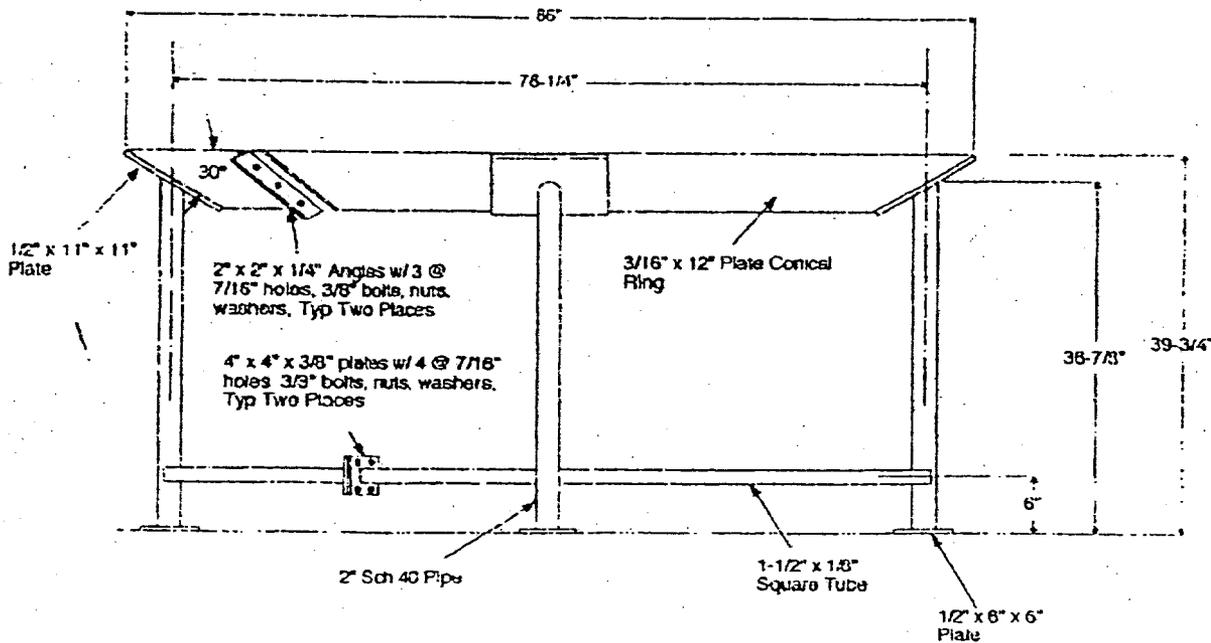
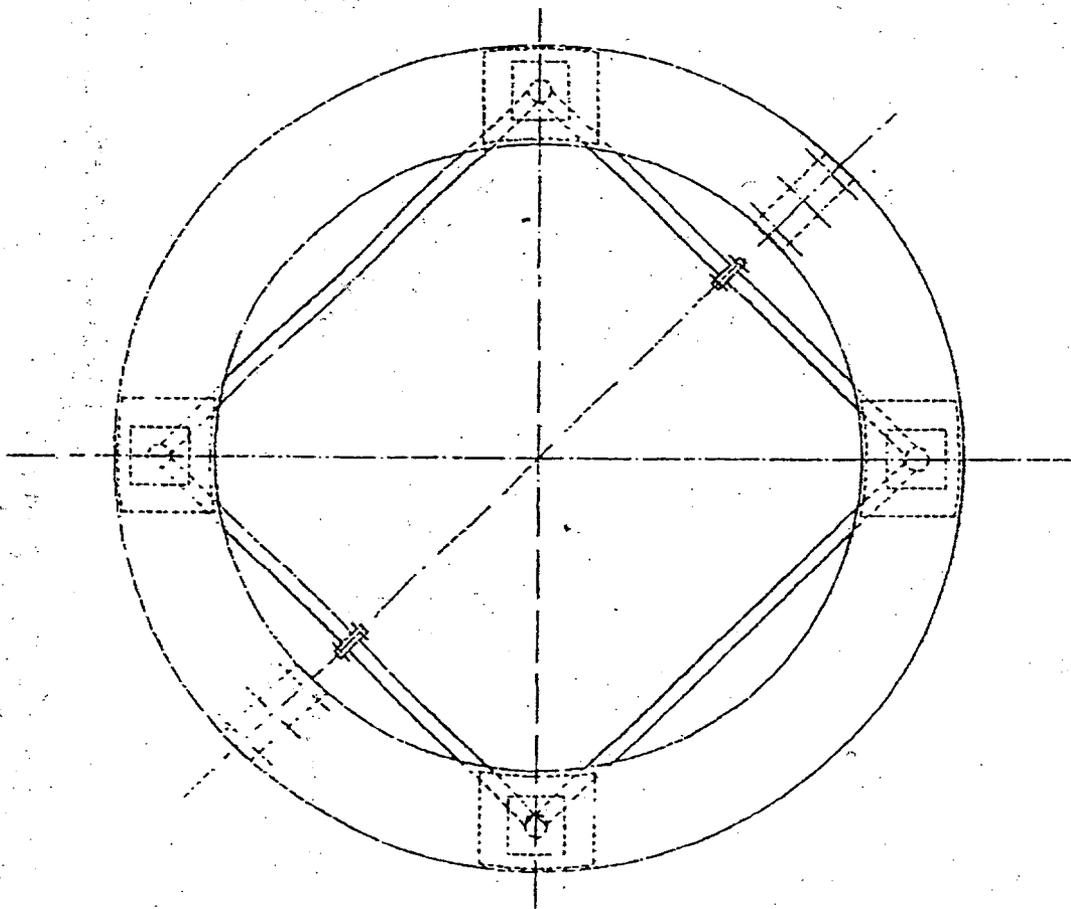
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# SNYDER INDUSTRIES INC.

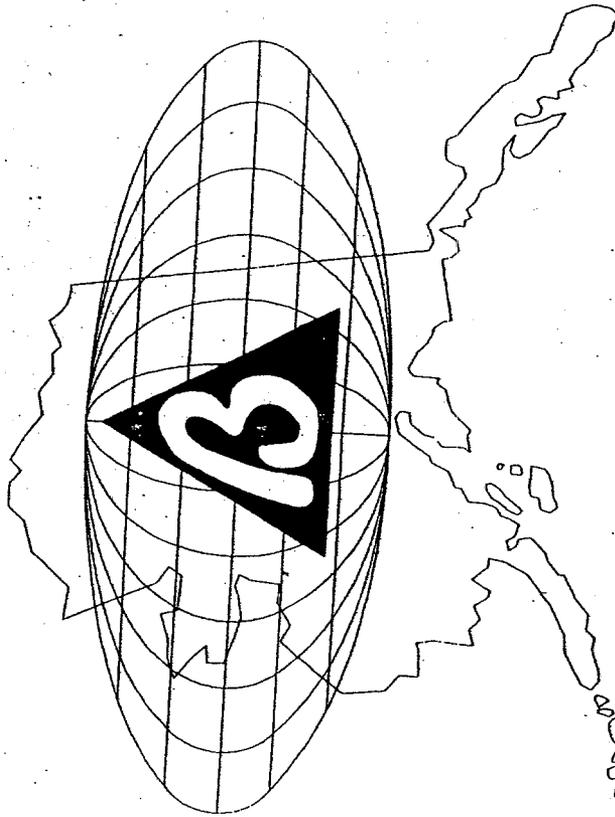


(all dimensions in inches)  
PART AS

1400 GAL. 30 DEG. CONE BOTTOM TANK



DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489  
FW50270/807



**Brown & Root Services Corporation**  
FT. WAINWRIGHT, ALASKA (JOC)

# DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489

FT. WAINWRIGHT, AK (JOC)

### DRAWING INDEX:

SHEET	DWG	TITLE
1	T-1	TITLE SHEET
2	C-1	SITE PLAN
3	A-1	FLOOR PLAN
4	A-2	EXTERIOR ELEVATIONS & WALL SECTION
5	A-3	INTERIOR ELEVATIONS & WALL SECTION
6	A-4	WALL SECTIONS
7	A-5	ROOF SECTIONS
8	S-1	FOUNDATION SECTIONS
9	S-2	FOUNDATION SECTIONS
10	M-1	EQUIPMENT LIST & SCHEDULES
11	M-2	UNDER SLAB HEATING PLAN
12	M-3	FORCED-AIR HEATING PLAN
13	M-4	PUMPING PLAN
14	M-5	HEAT EXCHANGER PLAN
15	M-6	HEAT EXCHANGER DIAGRAMS
16	M-7	WATER SEWER & S/C ANCHOR
17	M-8	SERVICE CONNECTION DIAGRAMS
18	M-9	OPERATING SEQUENCE, MAU-1 & EF-1, MAJ-1
19	M-10	OPERATING SEQUENCE, SLAB HEAT & HR-1
20	E-1	OPERATING SEQUENCE, SP-1 & POWER WASHER
21	E-2	ELECTRICAL PLAN, GENERAL CONTROLS
22	E-3	ELECTRICAL PLAN, HEATING & EXHAUST
23	E-4	ELECTRICAL PLAN, HEATING & EXHAUST
24	E-5	ELECTRICAL PLAN, HEATING & EXHAUST

### ABBREVIATIONS:

AB	ANCHOR BOLT
ADJ	ADJUST / ADJUSTMENT
AF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
APPROX	APPROXIMATELY
BLDG	BUILDING
CL	CAST IRON
CLR	CLEARANCE
CM	CONCRETE MASONRY UNIT
COND	CONDENSATE
CON	CONCRETE
CONT	CONTINUOUS
COV	CORNER
CU	COPPER
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
EACH	EACH
EQU	EQUALLY
EXIST	EXISTING
EXP	EXPANSION
GA	GALVANIZED
GRV	GROUDED
GRB	GYP/SUM WALL BOARD
HORIZ	HORIZONTAL
HPS	HIGH-PRESSURE STEAM
INSUL	INSULATION
JT	JOINT
MATL	MATERIAL
MOP	MAN DISTRIBUTION PANEL
MIN	MINIMUM
NFS	NON-FROST SUSCEPTIBLE
NTS	NOT TO SCALE
OC	ON CENTER
PL	PLATE
SP	SPACED
T&G	TONGUE & GROOVE
TEMP	TEMPERATURE
TYP	TYPICAL
VERT	VERTICAL
VTR	VENT THROUGH ROOF
WFF	WELDED WIRE FABRIC



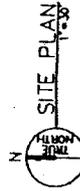
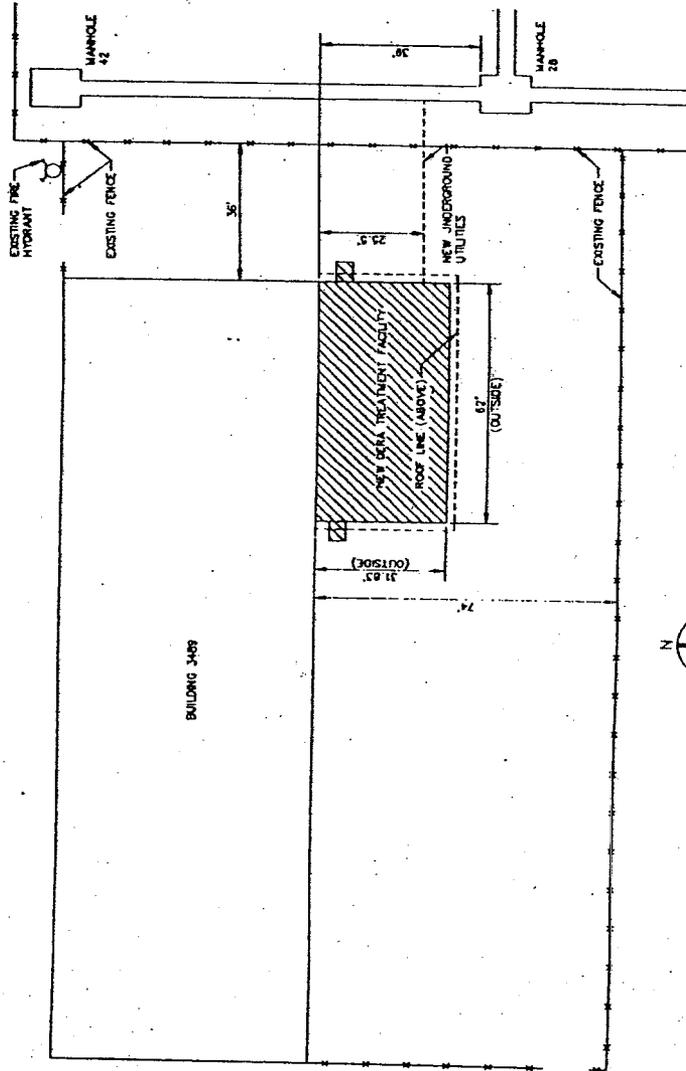
**Brown & Root Services Corporation**

REVISION:	DRAWING NO: T-1
D.O.M.:	DRAWN BY: WJN
	CM

DATE:	07-01-98
SCALE:	NONE
SHEET NO:	1 OF 24

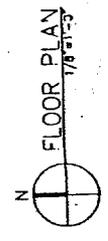
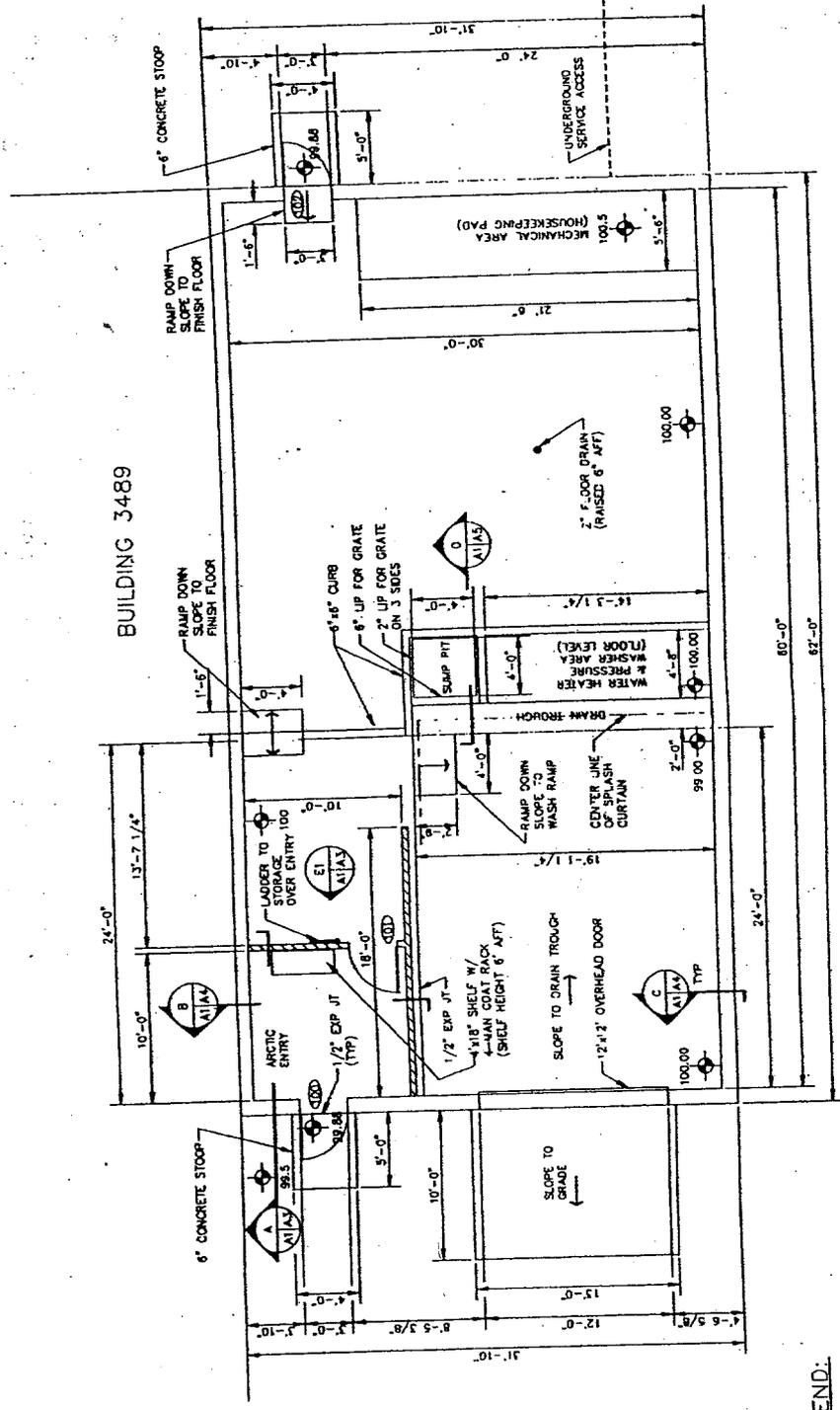
FT. WAINWRIGHT, AK (JOC)  
DERA TREATMENT FACILITY,  
ADDITION TO BUILDING 3489  
TITLE SHEET  
FW50270/807

SCALE FACTOR: 1



Brown & Root Services Corporation		FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 SITE PLAN PW50270/807	
DATE:	07-01-96	SCALE:	1"=80'
REVISION:		SHEET NO.:	2 OF 24
DRAWING NO.:	C-1	SCALE FACTOR:	1
D.O.M.:	GM	CHECK BY:	WJN

BUILDING 3489



LEGEND:

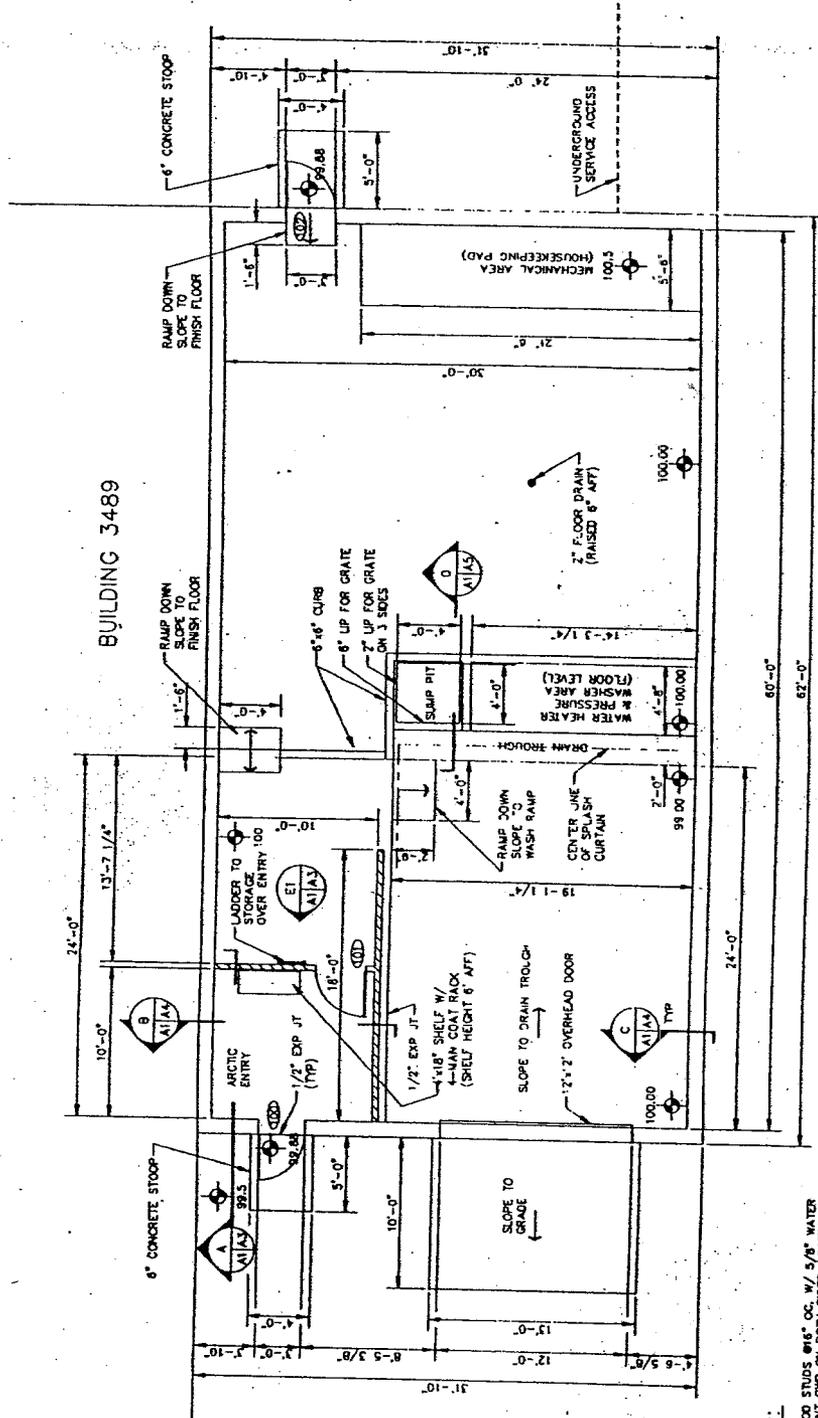
- 2x4 WOOD STUDS @ 16" OC. W/ 5/8" WATER RESISTANT GBS ON BOTH SIDES. BOTTOM PLATES, & STUDS IN CONTACT W/ GMB WILL BE PRESSURE TREATED.
- ELEVATION DATUM
- DOOR NUMBER

NOTES:

1. THE MASONRY WALLS UP TO 4" FROM THE FLOOR, THE FLOOR, CURBING, SUMP PIT, TROUGHS & EXPOSED JOINTS SHALL BE CALKED & SEALED WITH A COATING PRODUCT CAPABLE OF RESISTING THE PENETRATION OF WATER & POL PRODUCTS.
2. THE REMAINING CHU WALL AREA WILL BE SEALED W/ A VACUUM SEALER, MASONRY BLOCK PORE SEALER, ALONG W/ THE ENTRYWAY & CEILING SHALL BE PAINTED W/ 1 COAT PRIMER & TWO COATS OF SEMI-GLOSS LATEX PAINT.
3. THE CEILING WILL BE TAPED, FINISHED SMOOTH & PVA PRIMED BEFORE APPLYING TWO COATS OF SEMI-GLOSS LATEX PAINT.

<b>Brown &amp; Root Services Corporation</b>	
DRAWING NO:	A-1
DESIGNER:	WJN
D.O.M.:	GM

FT. WAINWRIGHT, AK  
 DERA TREATMENT FACI  
 ADDITION TO BUILDING  
 FLOOR PLAN  
 FW50270/807  
 SCALE



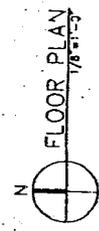
BUILDING 3489

**LEGEND:**

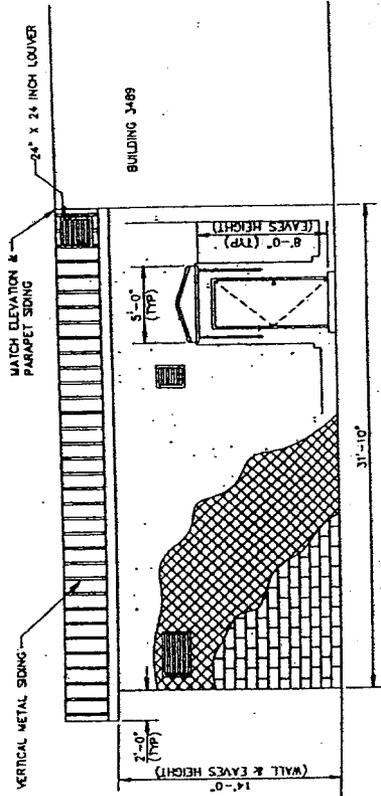
- 2x4 WOOD STUDS @16" OC. W/ 5/8" WATER RESISTANT OMB ON BOTH SIDES. BOTTOM PLATES & STUDS IN CONTACT W/ CMU WILL BE PRESURE TREATED.
- ELEVATION DATUM
- DOOR NUMBER

**NOTES:**

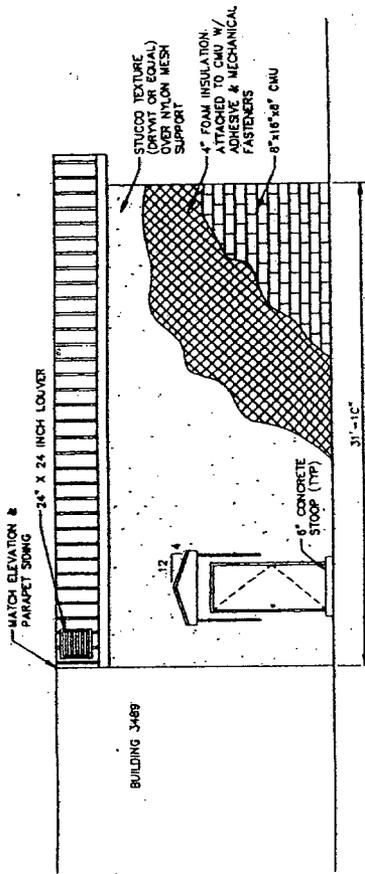
1. THE MASONRY WALLS UP TO 4" FROM THE FLOOR, THE FLOOR, CURBING, SUMP PIT, TROUGH & EXPANDED JOINTS SHALL BE CALKED & SEALED WITH A COATING PRODUCT CAPABLE OF RESISTING THE PENETRATION OF WATER & POL PRODUCTS.
2. THE REMAINING CMU WALL AREA WILL BE SEALED W/ 4 VACR SEALER, MASONRY BLOCK PORE FILLER & ALONG W/ THE ENTRYWAY & CEILING, SHALL BE PAINTED W/ 1 COAT PRIMER & TWO COATS OF SEMI-GLOSS LATEX PAINT.
3. THE CEILING WILL BE TAPED, FINISHED SMOOTH & PVA PRIMED BEFORE APPLYING TWO COATS OF SEMI-GLOSS LATEX PAINT.



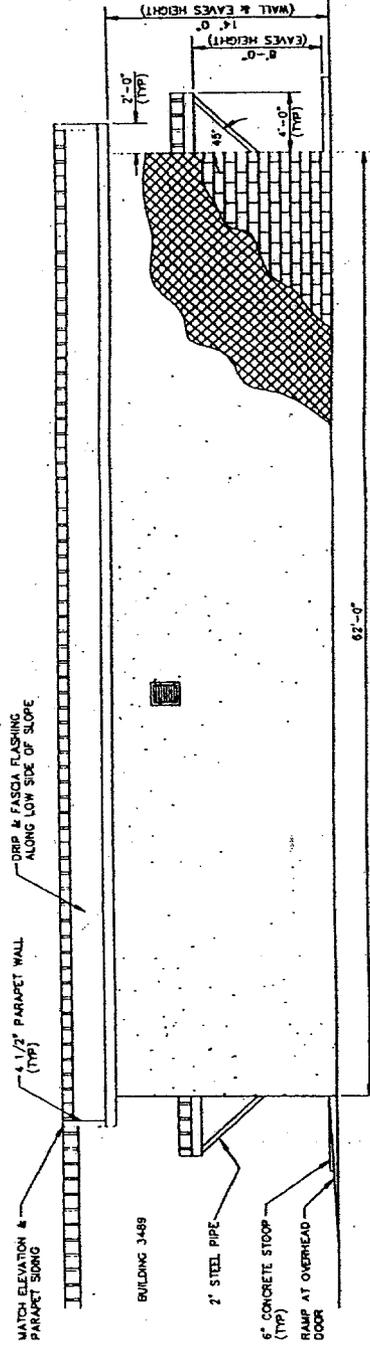
Brown & Root Services Corporation	
REVISION:	DRAWING NO: A-1
D.O.M.:	DATE: WIN
FT. WAINWRIGHT, AK DERA TREATMENT F/ ADDITION TO BUILDING FLOOR PLAN FW50270/807	



WEST ELEVATION  
1/8"=1'-0"



EAST ELEVATION  
1/8"=1'-0"

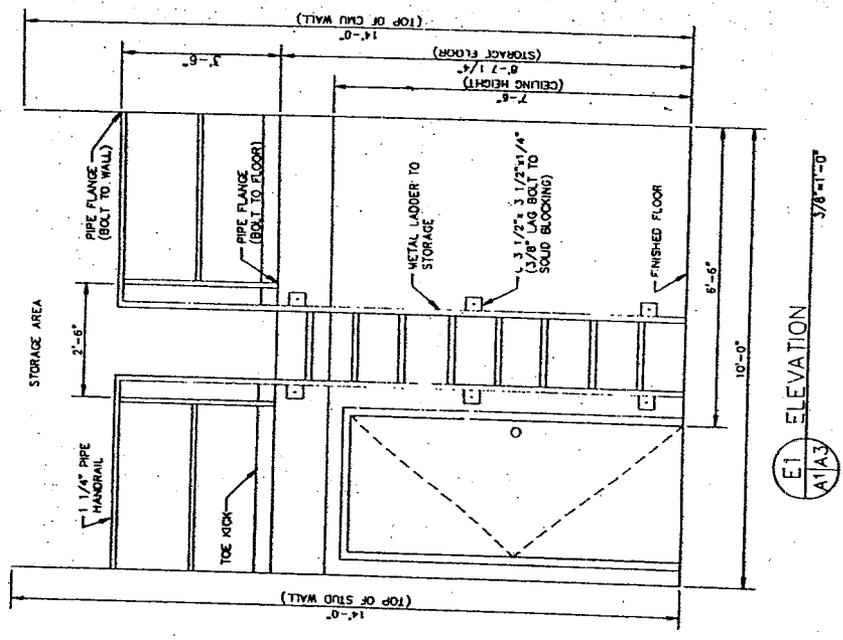
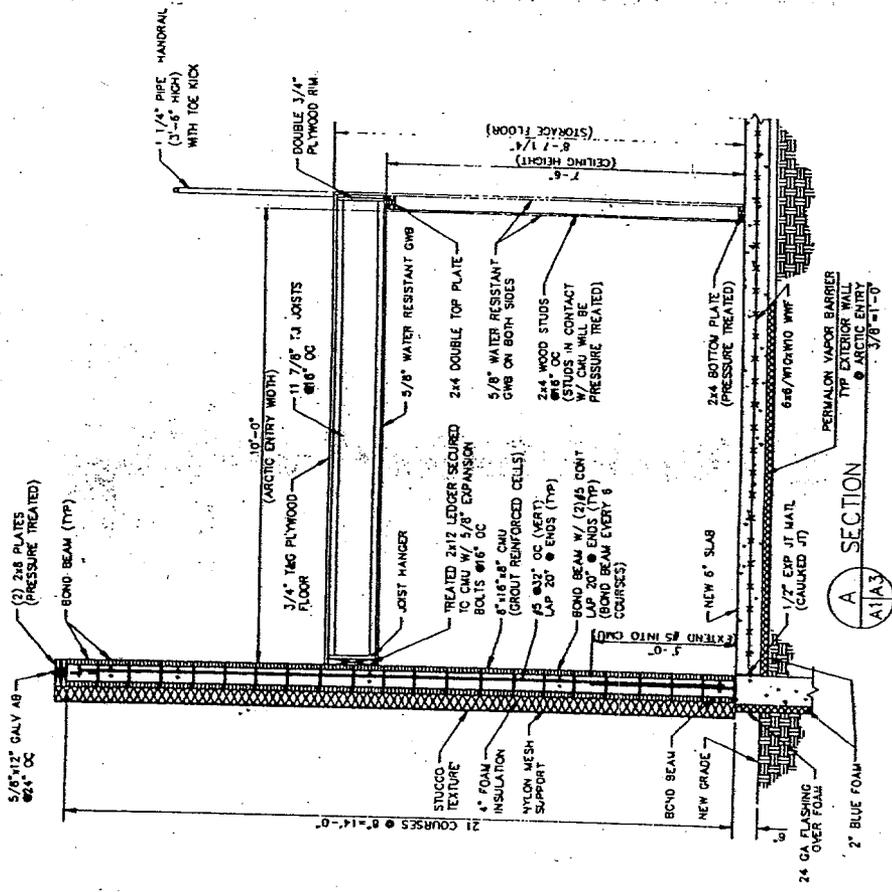


SOUTH ELEVATION  
1/8"=1'-0"

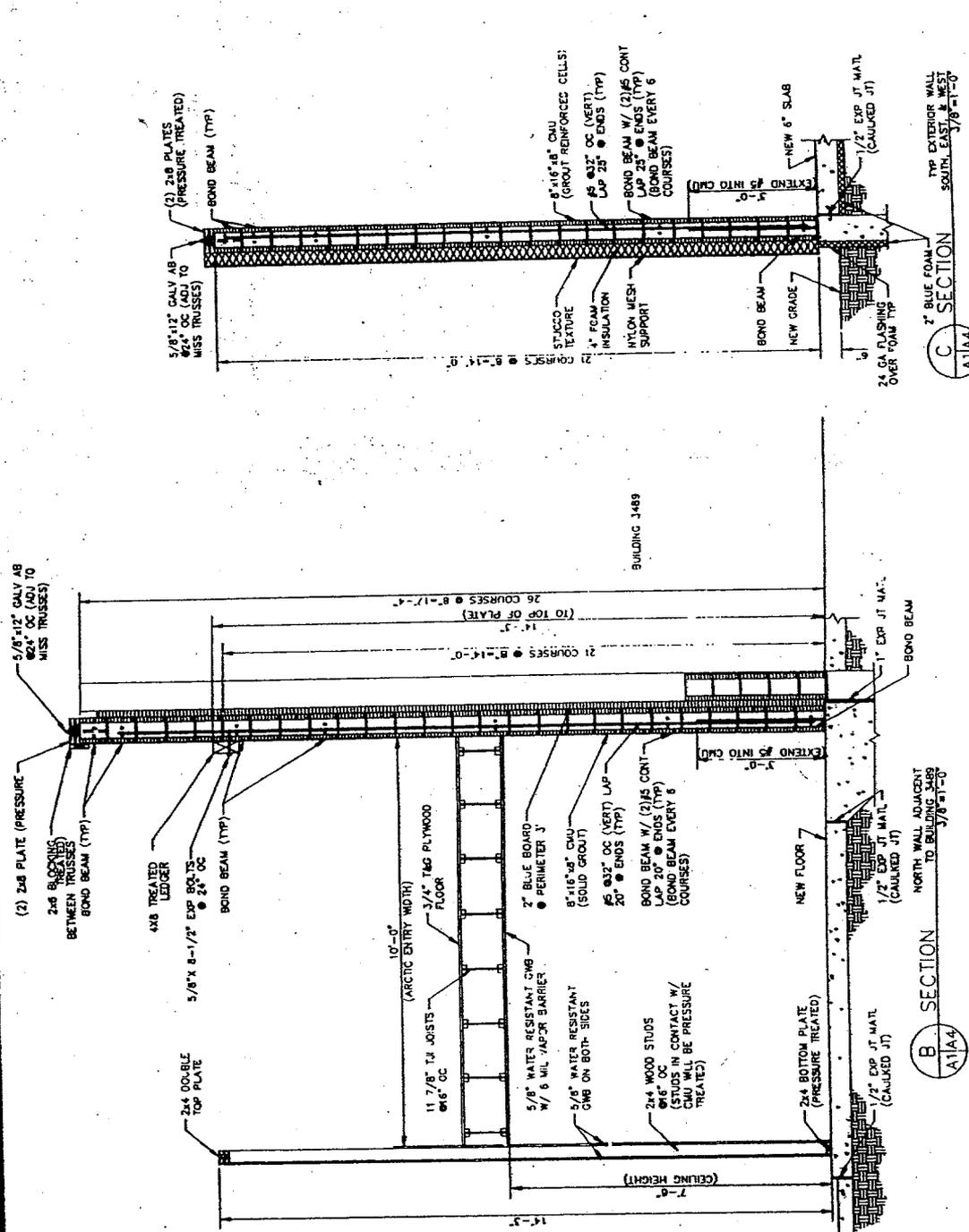
DATE:	07-01-86
SCALE:	1/8" = 1'-0"
SHEET NO.:	4 OF 24

Brown & Root Services Corporation	
REVISION:	DRAWING NO. A-2
D.O.M.:	DRAWN BY: WJN
SCALE FACTOR: 1	

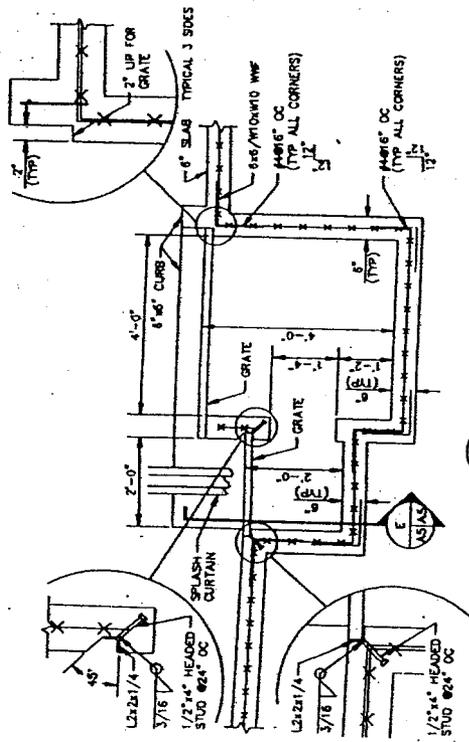
FT. WAINWRIGHT, AK (JOC)  
 DERA TREATMENT FACILITY,  
 ADDITION TO BUILDING 3489  
 EXTERIOR ELEVATIONS  
 FW50270/807



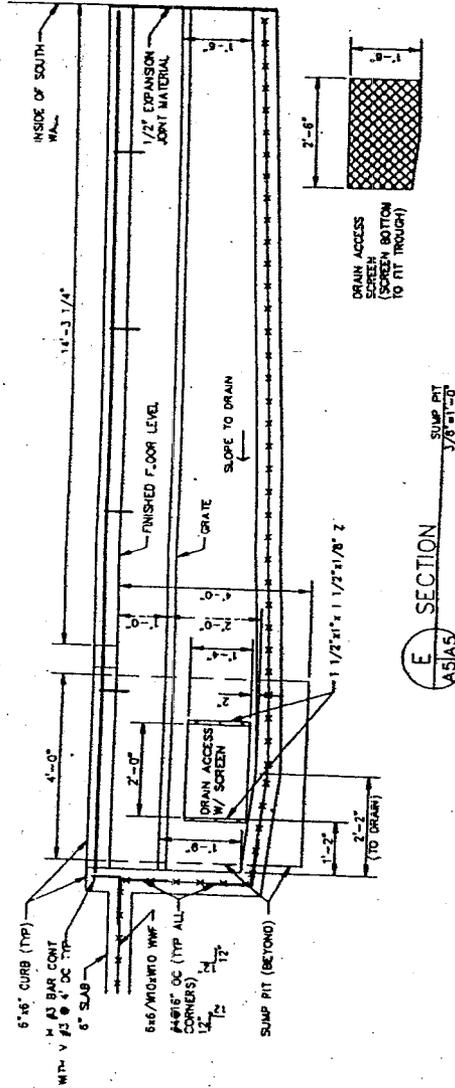
<b>Brown &amp; Root Services Corporation</b>		DATE: 07-01-96	
REVISION:	DRAWING NO: A-3	SCALE: 3/8" = 1'-0"	
D.O.M.:	DATE: WIN	SCALE FACTOR: 1	
GM	WIN	SHEET NO: 5 OF 24	
		FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 INTERIOR ELEVATION & WALL SECTION FW50270/807	



Brown & Root Services Corporation		SCALE FACTOR: 1	
REVISION:	DRAWING NO: A-4	FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY ADDITION TO BUILDING 3489 WALL SECTIONS FW50270/807	
D.O.M.:	DRAWN BY: WJN	DATE: 07-01-96	SHEET NO: 8 OF 24
GM		SCALE: 3/8" = 1'-0"	



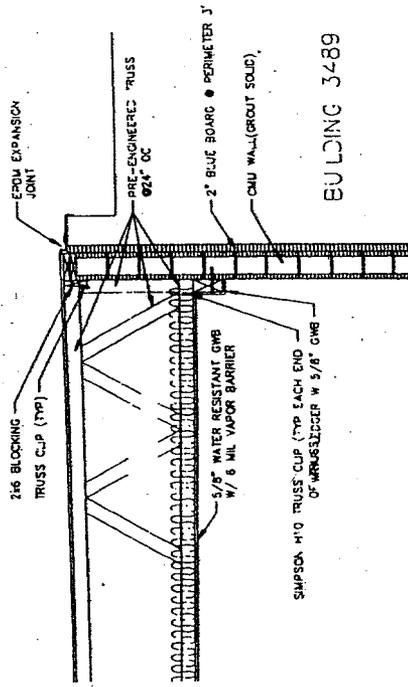
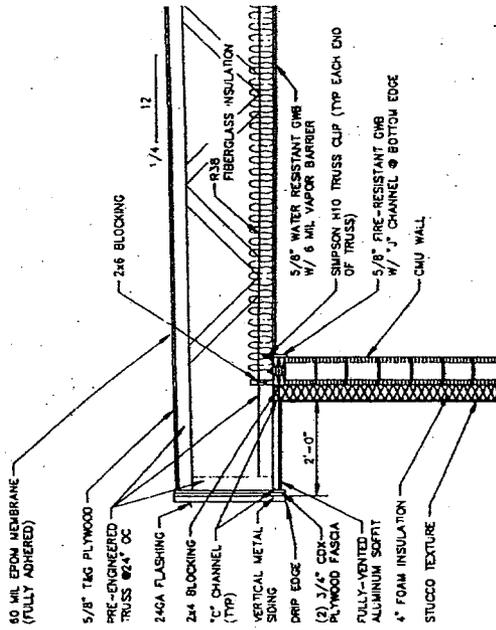
D SECTION  
 ATLAS  
 SUMP PIT  
 3/8" MIN



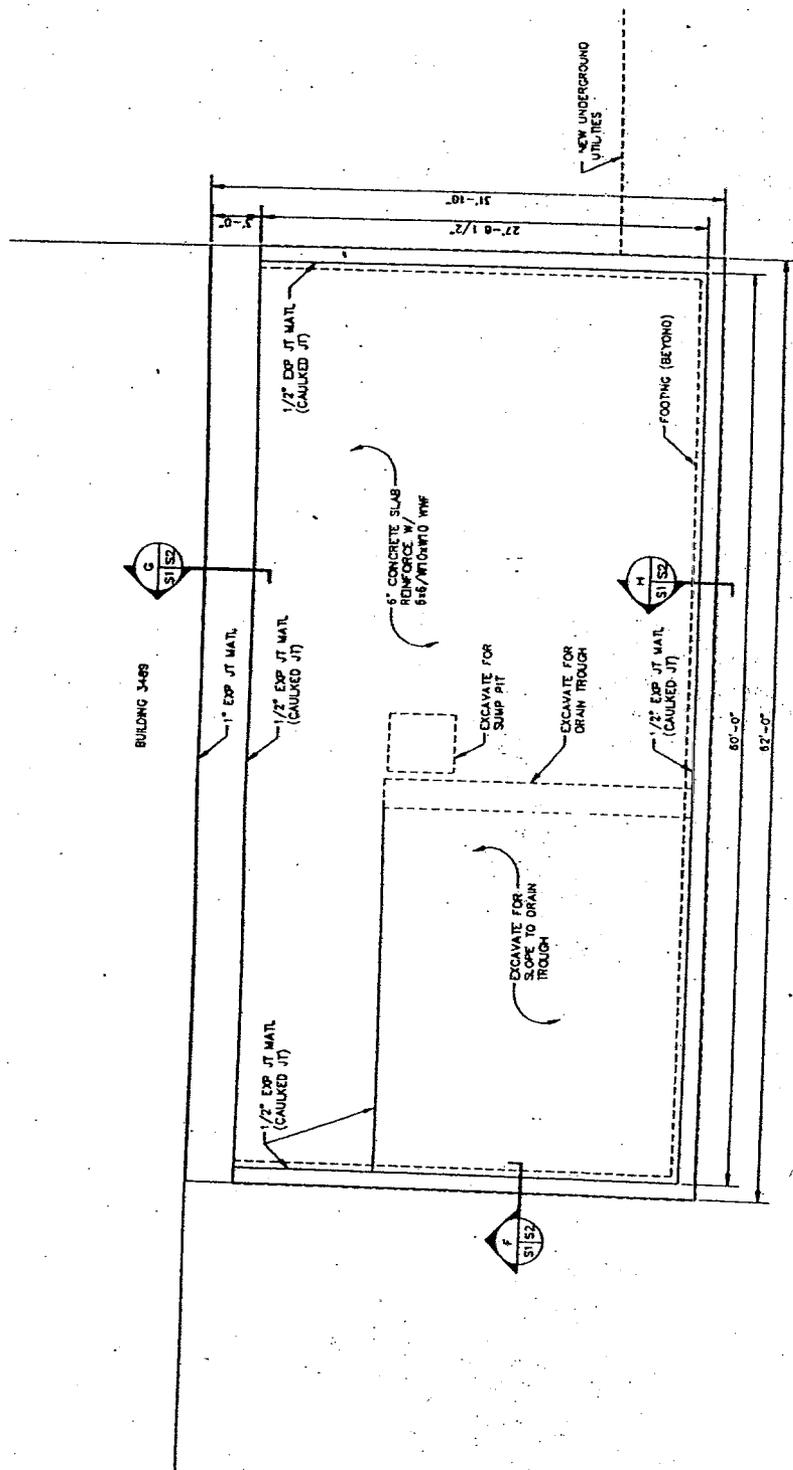
E SECTION  
 ASIAS  
 SUMP PIT  
 3/8" MIN

Brown & Root Services Corporation		DATE 07-01-86	
REVISION:	DRAWING NO. A-5	SCALE:	3/8" = 1'-0"
D.O.M.:	DRAWN BY: YJN	SHEET NO.:	7 OF 24
CM		SCALE FACTOR: 1	

FT. WAINWRIGHT, AK (JOC)  
 DERA TREATMENT FACILITY,  
 ADDITION TO BUILDING 3489  
 FLOOR SECTIONS  
 FW50270/807



<b>Brown &amp; Root Services Corporation</b> REVISION: DRAWING NO: A-6 D.O.M.: CM DRAIN BY: WIN		FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 ROOF SECTIONS FW50270/807 SCALE FACTOR: 1
DATE: 07-01-96 SCALE: 3/8" = 1'-0" SHEET NO: 8 OF 24		



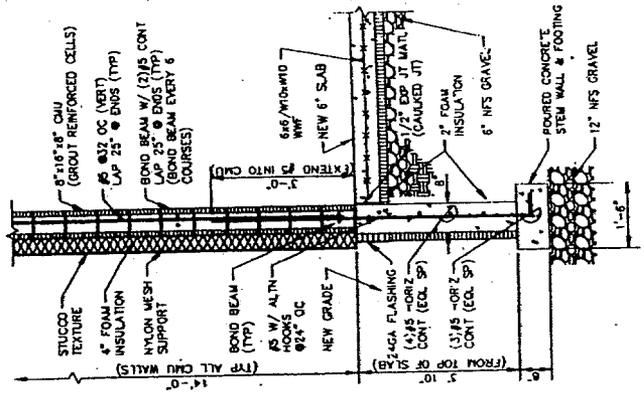
N  
FOUNDATION PLAN  
1/8"=1'-0"

DATE: 07-01-96  
SCALE: 1/8"=1'-0"  
SHEET NO: 9 OF 24

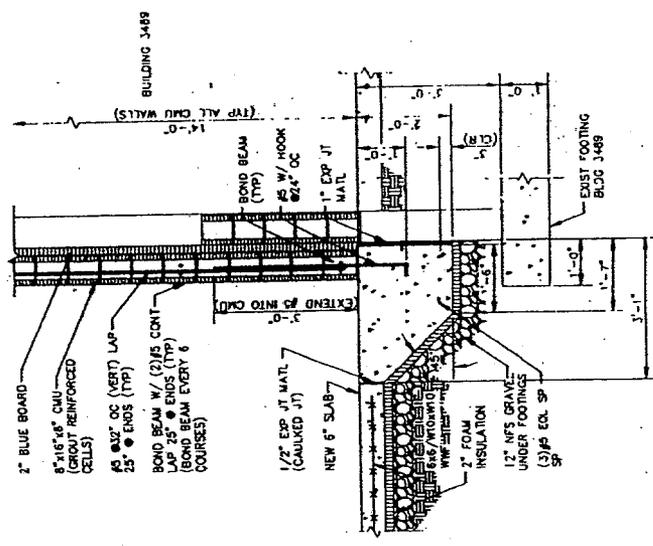
**Brown & Root Services Corporation**  
 FT. WADSWORTH, AK (JOC)  
 DERA TREATMENT FACILITY  
 ADDITION TO BUILDING 3489  
 FOUNDATION PLAN  
 FW60270/807  
 SCALE FACTOR: 1

REVISION:  
 D.O.M.:  
 DRAWING NO: S-1  
 DRAWN BY: WIN

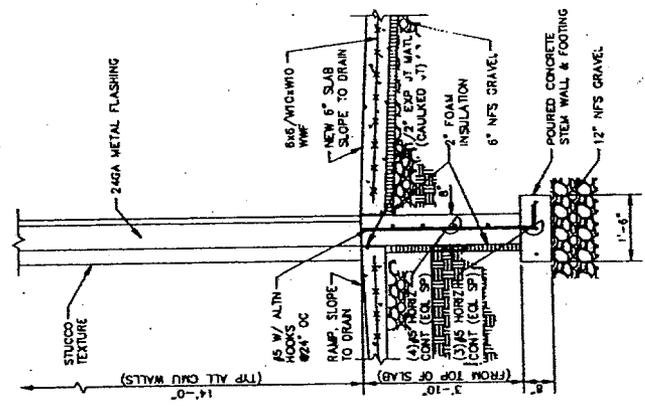
GM



H SECTION  
 TYP EXTERIOR WALL  
 SOUTH EAST  
 3/8" = 1'-0"



G SECTION  
 NORTH WALL ADJACENT  
 TO BUILDING 3489  
 3/8" = 1'-0"



F SECTION  
 EXTERIOR WALL  
 OVERHEAD DOOR  
 3/8" = 1'-0"

DATE: 07-01-96  
 SCALE: 3/8" = 1'-0"  
 SHEET NO: 10 OF 24

FT. WAINWRIGHT, AK (JOC)  
 DERA TREATMENT FACILITY,  
 ADDITION TO BUILDING 3489  
 FOUNDATION SECTIONS  
 FW50270/807

Brown & Root Services Corporation		SCALE FACTOR: 1	
REVISION:	DRAWING NO: S-2	DRAFTSMAN: WJN	
D.O.M.:	GM		

**EQUIPMENT LIST**

SYMBOL	MANUFACTURER	MODEL NUMBER	CAPACITY	SYMBOL	MANUFACTURER	MODEL NUMBER	CAPACITY
HE-1	B & G	SU-65	HEAT EXCHANGER 472.6 MBH, STEAM 595/HR 15 PSIG STEAM, 160F ENT 80F LWT 50% PROPYLENE GLYCOL/ WATER SOLUTION 62 GPM	WH-1	MOR-FLO	F5C82	WATER HEATER 82 GALLON ELECTRIC
E-1	AMTROL	A-30	EXPANSION TANK 40 GALLONS ASME CODE STAMP	HB-1	NECO	73	HOSE BEBS
AS-1	TACO	4-34	AIR SEPARATOR 2-1/2" DIAMETER 62 GPM	FD-1	JOSAM	30000-5A-F4	2" FLOOR DRAIN 5" STRAINER NIKALOY TOP 1/2" NIKALOY FLANNEL
UH-1	TRANE	S-65	UNIT HEATER 85 MBH 50/50 PROPYLENE GLYCOL/ WATER SOLUTION 65F EAT, 85F LAT 1607 LWT, 1607 LWT, 9.68 GPM 2300 CFM 1/8 HP MOTOR 120V/19/60HZ	FCO	JOSAM	56012	2" FLOOR CLEAN-OUT
MAU-1	TRANE	MCC SIZE 06	MAKE-UP AIR UNIT Q/A 1800 CFM @ -60F R/A 1200 CFM @ -65F S/A 3000 CFM @ -60F MIXING BOX @ -60F V-FILTERS - PLEATED FAN 3000 CFM, 1.5 HP 120V/19/60HZ	YCO	JOSAM	58864	4" YARD CLEAN-OUT
PHC-1	-----	-----	PRE-HEAT COIL 3000 CFM EAT -13F, LAT -45F 1887 MBH, LWT 160F 1587 MBH 20.93 GPM	SRV-1	SARCO	25P	STEAM PRESS-REDUCING VALVE 100 PSIG INLET 15 PSIG OUTLET RATED FOR 395A/HR
RHC-1	Trane	-----	RE-HEAT COIL 3000 CFM LAT 60F EAT 160F, LWT 160F 113.9 MBH 12.63 GPM	ST-1	SARCO	-----	STEAM RELIEF VALVE 595A/HR, SET PRESS. 20 PSIG 1-1/2" 585 F/HR
EF-1	TRANE	FNA-14,000 A1-0040	EXHAUST FAN 500 WGL L/A 231 RPM 1281 RPM 1.67 HP 115V/19/60HZ 1 SP - TFC MOTOR	FT-1	SARCO	FT-15	FLOOR & THERMOSTAT TRAP
L-1	-----	-----	LOUVER FOR EF-1 22.5" HIGH x 18" WIDE GALVANIZED FINISH	TD-1	SARCO	TD-52	THERMO-DYNAMIC TRAP
L-2	-----	-----	LOUVER FOR MAU-1 18" HIGH x 36" WIDE GALVANIZED FINISH	RV-1	BELL & GOSSETT	-----	GLYCOL RELIEF VALVE 475 MBH, SET 45 PSIG
PM-1	LANDA	ZL-2-110110	POWER WASHER 1000 RPM, 15 HP 120V/19/60HZ, 16 AMPS 2.5 GPM PUMP: TRI-PLUNGER, OIL BATH HOSE: SINGLE BRAID WIRE 3/8" ID x 25' GUN, TRIGGER HANDLE, 15' WAND, 15' 1/4" COUPLER	CV-1	SEBE (BARBER-COLMAN)	35-223-201-4-19 CONTROLLER CP 8102	CONTROL RELIEF VALVE MOUNT IN PANEL

**DJMP SCHEDULE**

SYMBOL	MANUFACTURER	MODEL NUMBER	CAPACITY
GP-1	GOULDS	355	GLYCOL MAKE-UP PUMP 1/2" GALLON DIAPHRAM TANK 1/3 HP NATURAL PRESSURE SWITCH :20V/19/60HZ
CP-1A & 1B	BELL & GOSSETT	80-1.5 x 1.5 x 9.5	CIRCULATING PUMP 62 GPM, 40 ODP STD EFF MOTOR
SP-2	BELL & GOSSETT	90-345	CIRCULATING PUMP - SLAB HEAT 0 GPM, 45 HD, 120V/19/60HZ ODP STD EFF MOTOR
SP-1	GOULDS	MODEL WCD317L-3085 FLOAT SWITCH, AS-7	SUMP PUMP W/INTERGRAL FLOAT SWITCH, 2" DISCHARGE, 1/2HP, 115V/19/60HZ, 42 GPM, 18"HD
CR-1	HOFFMAN	WCD12-Z08-WA	CONDENSATE RECEIVER 14 GALLONS RECEIVER, ST 19 GPM, 620 PSIG DISCHARGE 1/2" FLOAT SWITCH, 1/3 HP, 3500 RPM, 115/230V/60HZ/1PH, ODP MOTOR

**MECHANICAL LEGEND:**

⊗	GATE VALVE	⊖	UNION
⊗	GLOBE VALVE	⊖	CAP
⊗	BALANCING VALVE	⊖	REDUCER
⊗	CHECK VALVE	⊖	STRAINER 1/2" DRAIN VALVE
⊗	PRESSURE REDUCING VALVE	⊖	THERMO-DYNAMIC TRAP
⊗	CONTROL VALVE	⊖	FLOW & THERMOSTAT TRAP
⊗	J-WAY CONTROL VALVE	⊖	CONTROL DAMPER MOTOR
⊗	RELIEF VALVE	⊖	PUMP
⊗	BALL VALVE	⊖	PRESSURE GAUGE
⊗	DRAIN VALVE	⊖	THERMOSTAT

- ⊗ 2" FLOOR DRAIN (RAISED 6" AFF)
- ⊗ WATER HEATER
- ⊗ HOT WATER
- ⊗ COLD WATER
- ⊗ SANITARY SEWER
- ⊗ UNIT HEATER (UH-1)
- ⊗ MAKE-UP AIR UNIT (MAU-1)
- ⊗ EXHAUST FAN (EF-1)
- ⊗ CONTROL SENSOR WELL
- ⊗ AQUASTAT
- ⊗ THERMOSTAT
- ⊗ CLEAN-OUT
- ⊗ ERHAUST FAN SWITCH
- ⊗ GLYCOL HEAT SUPPLY
- ⊗ GLYCOL HEAT RETURN

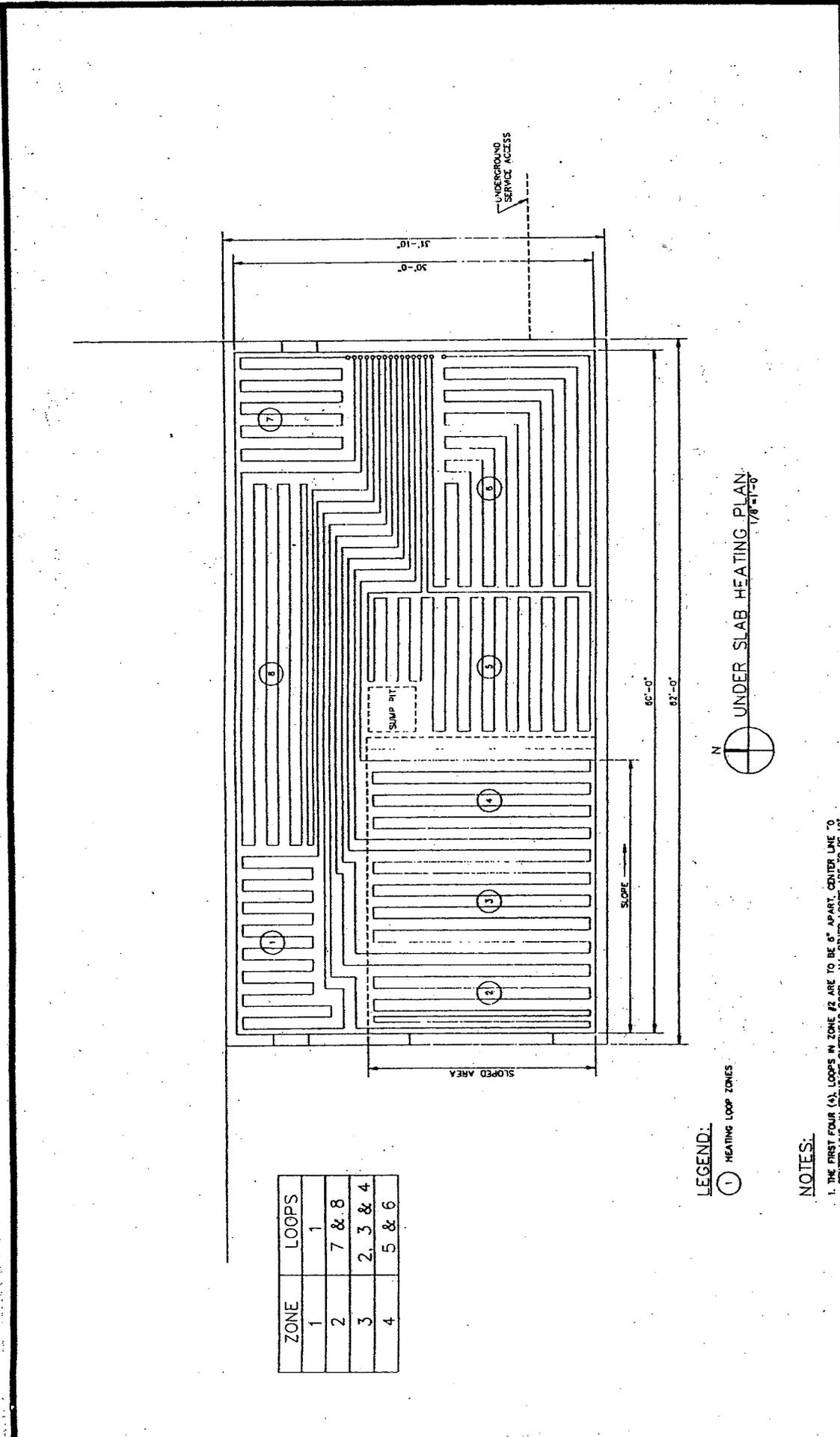
**Brown & Root Services Corporation**

FT. WAINWRIGHT AK (IOC)  
DERA TREATMENT FACILITY,  
ADDITION TO BUILDING 3489  
EQUIPMENT LIST & SCHEDULES  
FW60270/807

DATE: 07-01-98  
SCALE: NO SCALE  
SHEET NO: 11 OF 24

SCALE FACTOR: 1

REVISION: M-0  
DRAWING NO: M-0  
D.O.M.:  
DRAWN BY: WJN  
CHK: GK



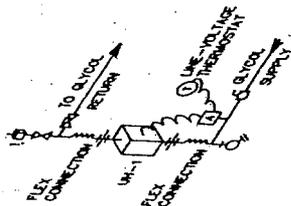
ZONE	LOOPS
1	1
2	7 & 8
3	2, 3 & 4
4	5 & 6

**LEGEND:**  
 (1) HEATING LOOP ZONES

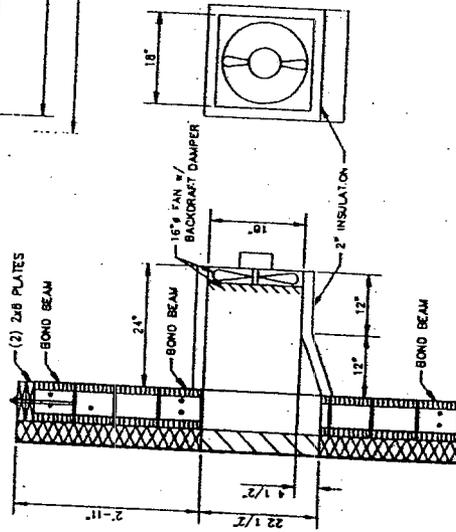
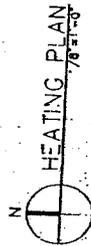
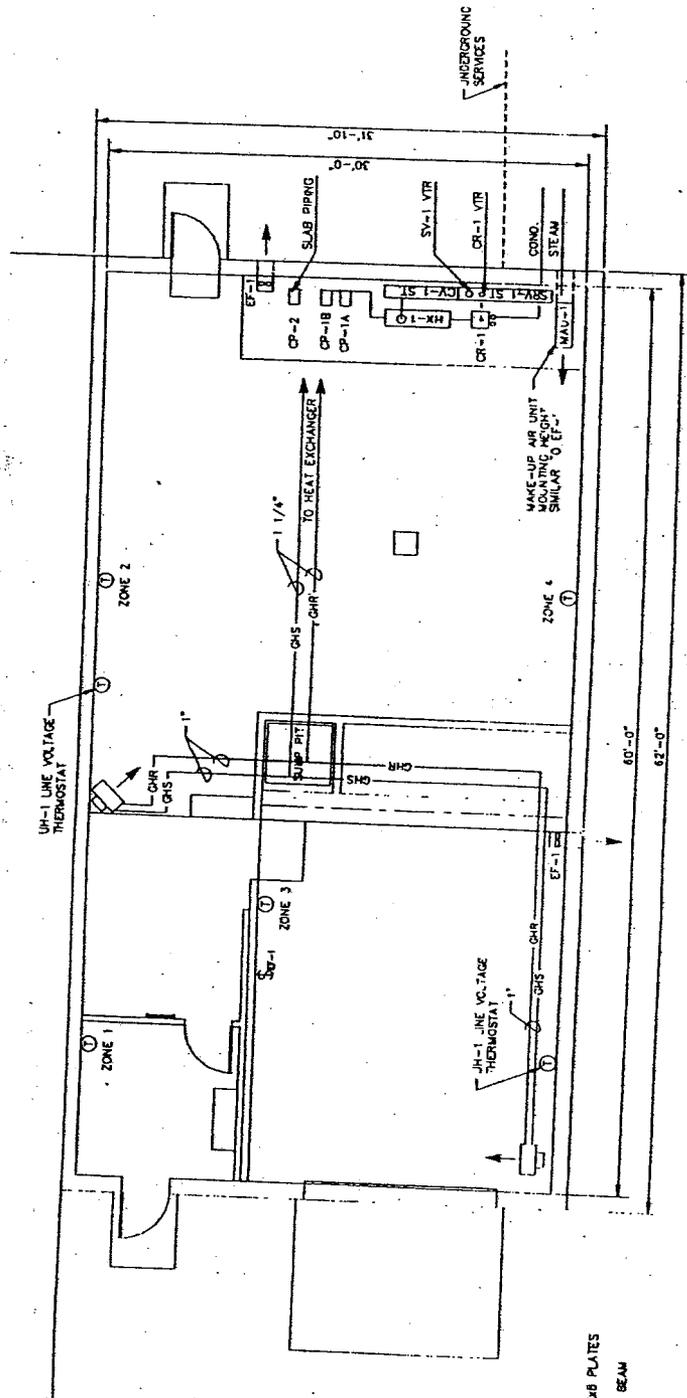
**NOTES:**  
 1. THE FIRST FOUR (4) LOOPS IN ZONE #2 ARE TO BE 6" APART CENTER LINE TO CENTER LINE IN FRONT OF OVERHEAD DOOR. ALL OTHER LOOPS ARE TO BE 12" APART, CENTER LINE TO CENTER LINE.  
 2. OVERALL LENGTH OF EACH COIL NOT TO EXCEED 300'.  
 3. HYDRONIC PIPING 5/8" PEX-WR350.  
 4. SET BALANCE VALVE FLOW RATE TO 1 GPM.

UNDER SLAB HEATING PLAN  
 1/8" = 1'-0"

<b>Brown &amp; Root Services Corporation</b>		<b>FT. WAINWRIGHT, AK (JOC)          DEBRA TREATMENT FACILITY,          ADDITION TO BUILDING 3489          UNDER SLAB HEATING PLAN          FW60270/807</b>	
REVISION:	DRAWING NO: M-1	DATE: 07-01-96	SCALE: 1/8" = 1'-0"
D.C.M.: GM	DRAWN BY: WJN	SHEET NO: 12 OF 24	SCALE FACTOR: 1

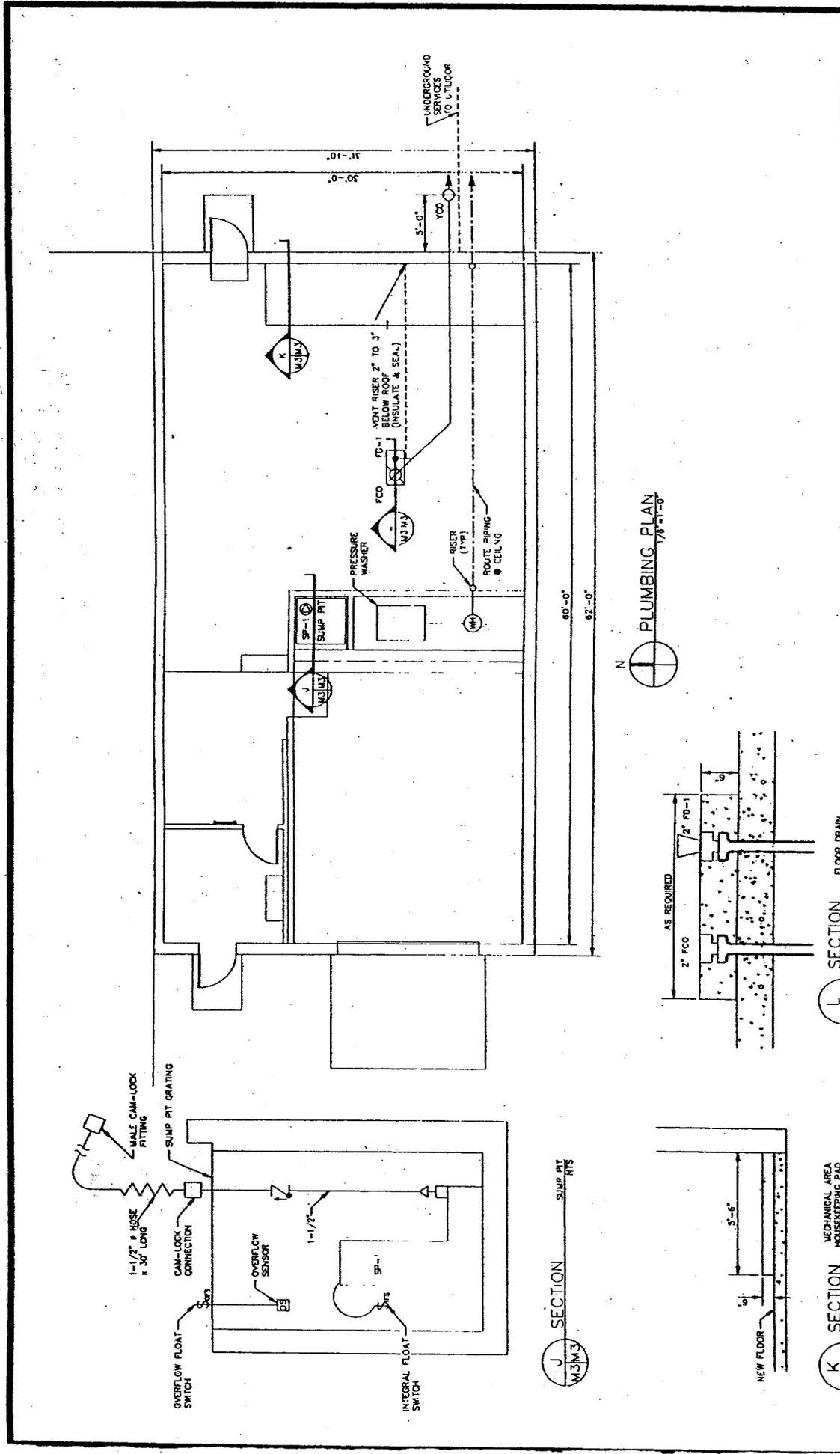


TYPICAL UNIT HEATER  
SINGLE LINE DIAGRAM  
NOT TO SCALE



TYPICAL EF-1  
1/2\"/>

Brown & Root Services Corporation				FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 HEATING PLAN FW50270/807	
REVISION:		DRAWING NO:	M-2	SCALE:	AS NOTED
D.O.M.:	GM	DRAWN BY:	WJN	SHEET NO.:	13 OF 24
			SCALE FACTOR: 1		



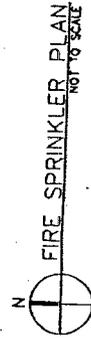
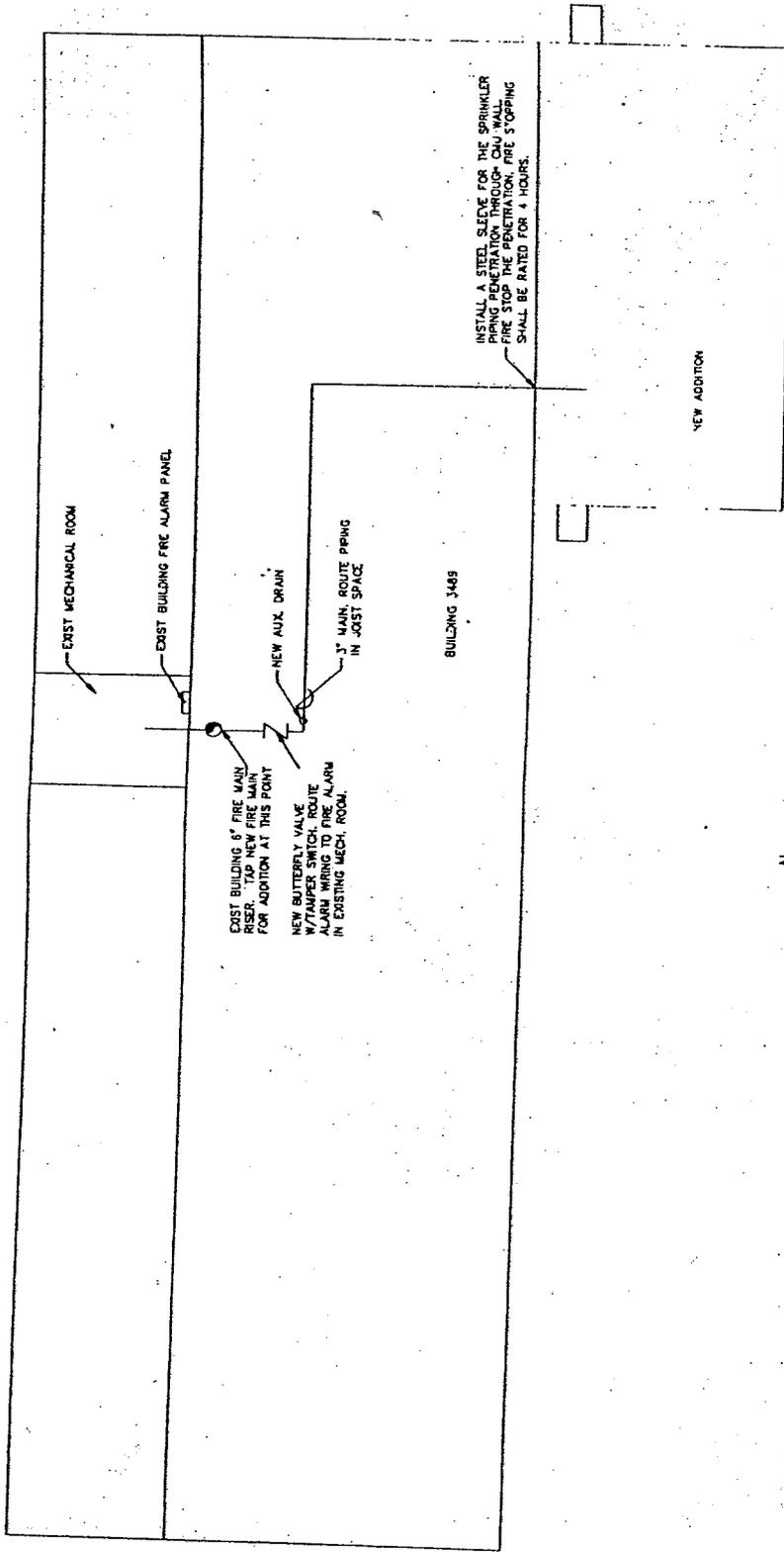
Brown & Root Services Corporation		DATE	07-01-96
REVISION:	DRAWING NO: M-3	SCALE	AS NOTED
DRAWN BY: CM	CHECKED BY: WJN	SHEET NO:	14 OF 24
FT. WAINWRIGHT AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 348B PLUMBING PLAN PW60270/807		SCALE FACTOR: 1	

J SECTION SUMP PIT NTS

K SECTION MECHANICAL AREA MOUSEKEEPING PAD NTS

L SECTION FLOOR DRAIN NTS

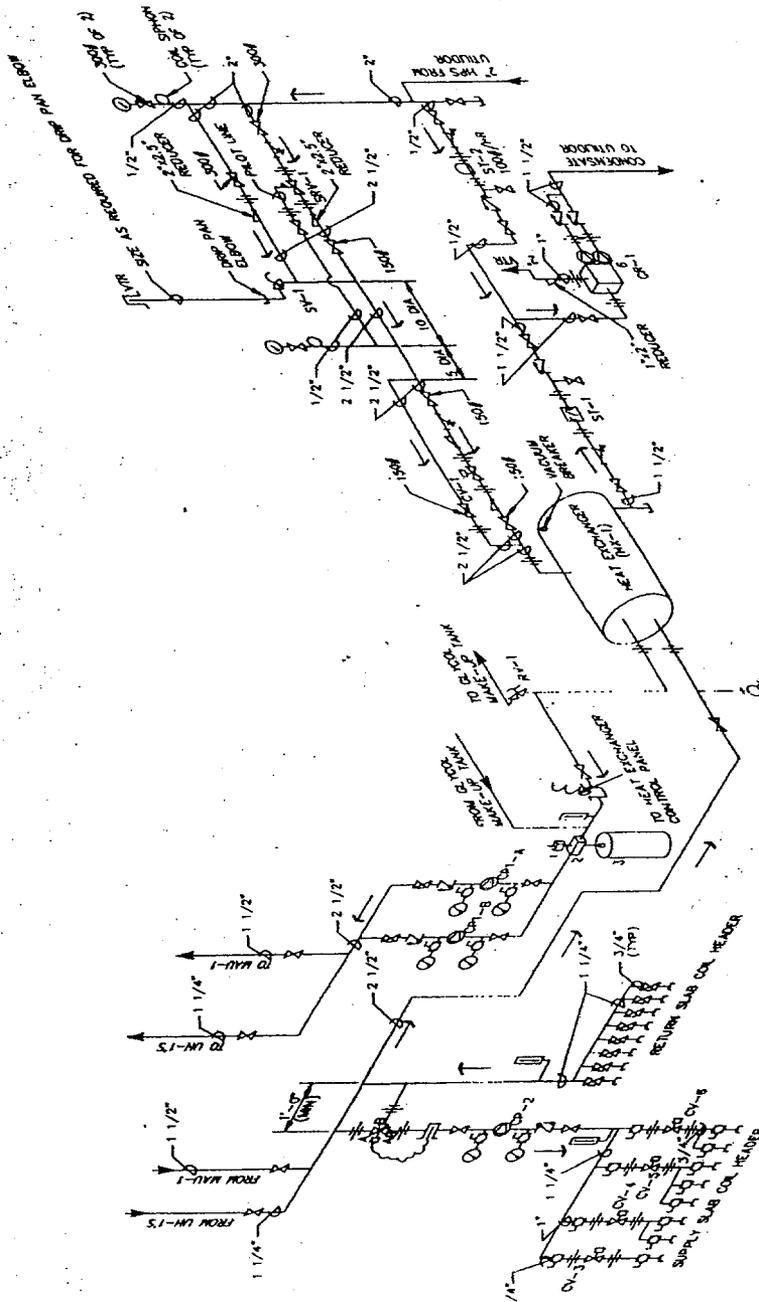
N PLUMBING PLAN 1/8"=1'-0"



**NOTE:**

SPRINKLER CONTRACTOR TO DESIGN A FIRE PROTECTION SYSTEM PER NFPA - 13 FOR CRUISE SHIP YARD (GROUP 1).  
SUBMIT STAMPED DRAWINGS FOR APPROVAL.

<b>Brown &amp; Root Services Corporation</b> <small>REVISION:</small> <small>DRAWING NO:</small> M-4 <small>DRAWN BY:</small> WJN		<small>DATE:</small> 07-01-98 <small>SCALE:</small> AS NOTED <small>SHEET NO:</small> 15 OF 24
<small>D.O.M.:</small> GM		FT. WAINWRIGHT, AK (JOC) DEBRA TREATMENT FACILITY, ADDITION TO BUILDING 3489 FIRE SPRINKLER PLAN FW50270/807 SCALE FACTOR: 1

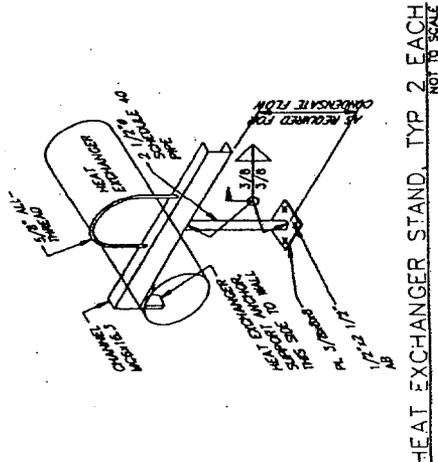


HEAT EXCHANGER ISOMETRIC DIAGRAM NOT TO SCALE

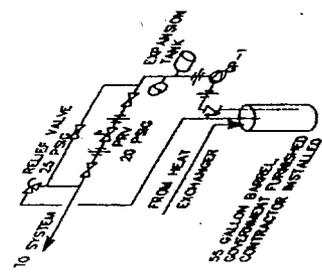
HEAT EXCHANGER ISOMETRIC DIAGRAM NOT TO SCALE

HEAT EXCHANGER & AIR HANDLING UNIT DIAGRAM SCHEDULE

1	AUTOMATIC AIR VENT (HIGH CAPACITY)
2	AIR SEPARATOR (AS-1)
3	REC. CAP. CONDENSATE TANK (ET-1)
4	TEMPERATURE SENSOR
5	TEMPERATURE SENSOR
6	DUPLEX CONDENSATE RECEIVER



HEAT EXCHANGER STAND, TYP 2 EACH NOT TO SCALE



GLYCOL MAKE-UP TANK ISOMETRIC DIAGRAM NOT TO SCALE

**Brown & Root Services Corporation**

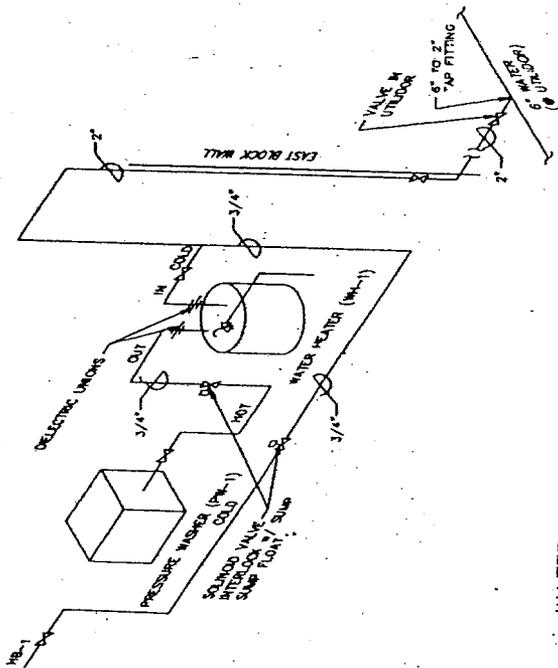
REVISION: M-5  
DRAWING NO: M-5  
SCALE: NO SCALE

DATE: 07-01-96  
SCALE: NO SCALE  
SHEET NO: 16 OF 24

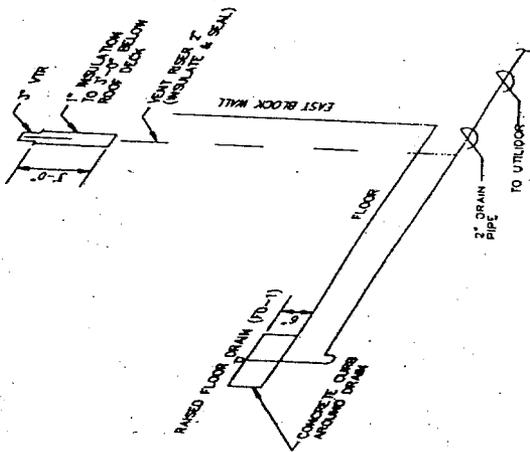
PROJECT: FT. WALWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 HEAT EXCHANGER DIAGRAMS FTW50270/807

SCALE FACTOR: 1

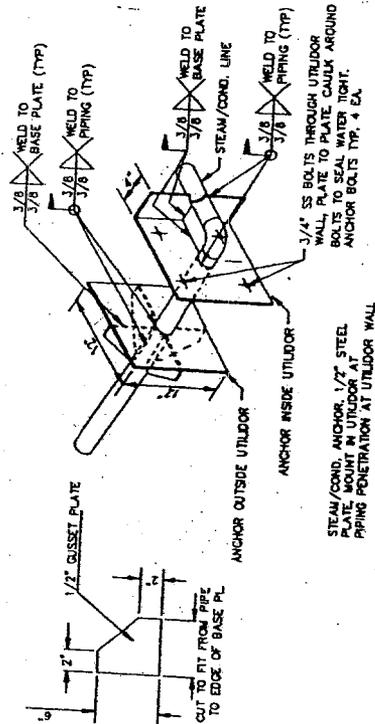
DESIGNER: GM  
DRAWN BY: WJN



WATER SUPPLY ISOMETRIC DIAGRAM  
NOT TO SCALE

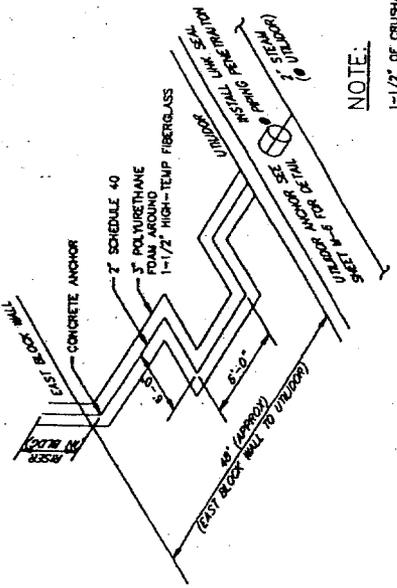


FLOOR DRAIN ISOMETRIC DIAGRAM  
NOT TO SCALE

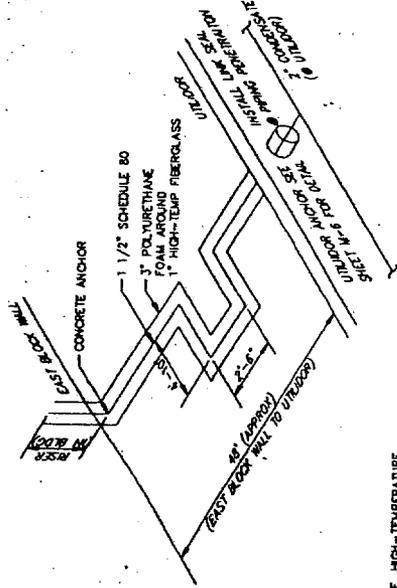


STEAM & CONDENSATE ANCHOR IN UTILIDOR  
NOT TO SCALE

Brown & Root Services Corporation			
REVISION:		DRAWING NO:	M-6
D.O.K.:	GM	DRAWN BY:	WJN
FT. WAINWRIGHT, AK (JOC) DEBRA TREATMENT FACILITY, ADDITION TO BUILDING 3499 WATER, WASTE & S/C ANCHOR FW50270/807		DATE:	07-01-86
		SCALE:	NO SCALE
		SHEET NO:	17 OF 24
		SCALE FACTOR:	1

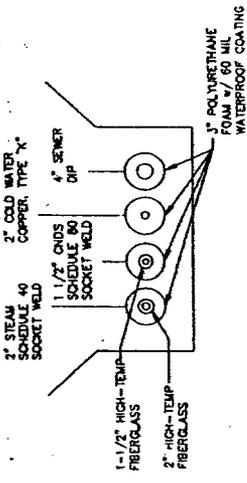


STEAM LINE TO UTILIDOR  
NOT TO SCALE

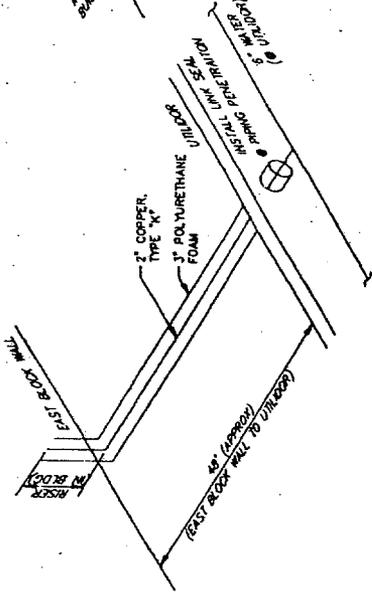


CONDENSATE LINE TO UTILIDOR  
NOT TO SCALE

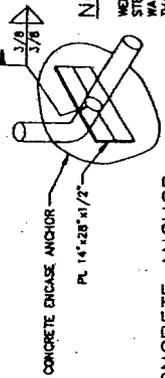
NOTE:  
1-1/2" OF CRUSHABLE, HIGH-TEMPERATURE FIBERGLASS EX. LOOP BENDS TO ALLOW FOR THERMAL EXPANSION.



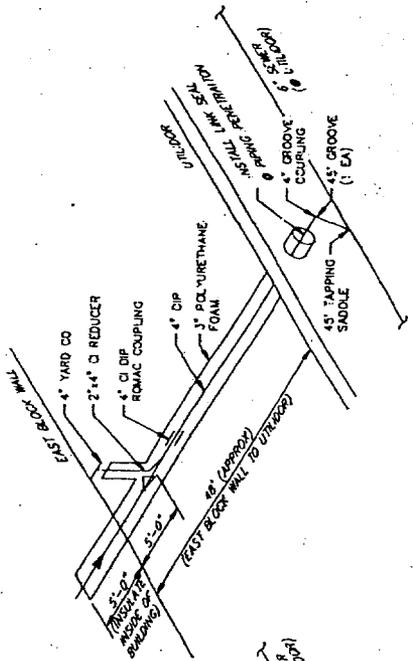
DIRECT BURIED UTILITIES  
NOT TO SCALE



WATER LINE TO UTILIDOR  
NOT TO SCALE



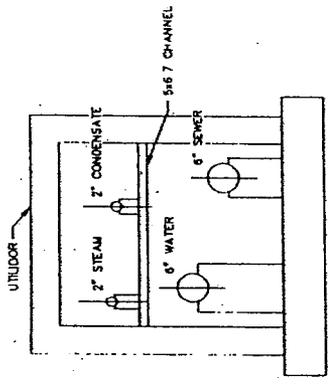
TYPICAL CONCRETE ANCHOR  
NOT TO SCALE



SEWER LINE TO UTILIDOR  
NOT TO SCALE

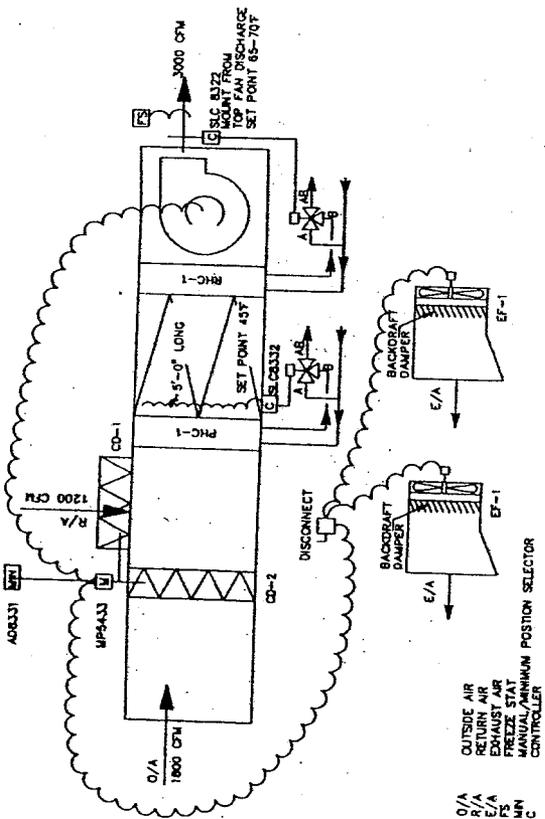
NOTE:

WELD ANCHOR PLATE @ 90° ELBOW FOR WATER, CONDENSATE, SPRAY URETHANE INSULATION. SET ANCHOR PLATE IN CONCRETE.



EXISTING UTILIDOR SECTION  
NOT TO SCALE

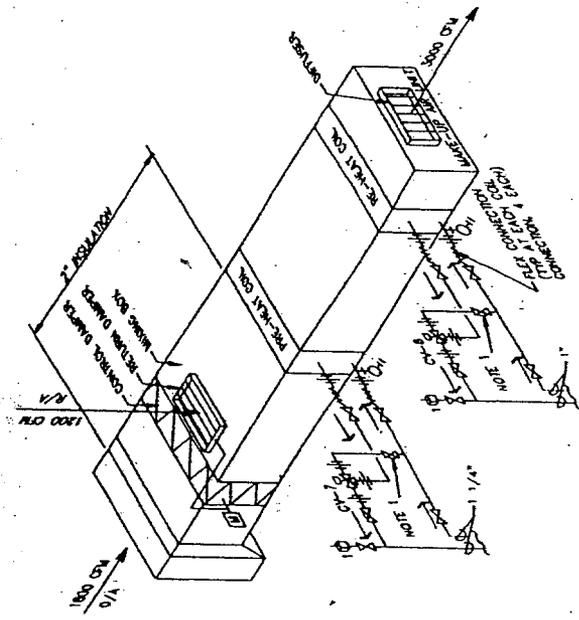
		DATE: 07-01-96 SCALE: NO SCALE SHEET NO: 18 OF 24
FT. VAINWRIGHT AK (IOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 SERVICE CONNECTION DIAGRAMS FW60270/807		SCALE FACTOR: 1
REVISION:	DRAWING NO: M-7 ORIGIN: WIN	
D.D.M.: GM		



**SEQUENCE OF OPERATION,  
MAU-1 & EF-1**

THE MAU-1 & EF-1'S ARE INTERLOCKED TO OPERATE TOGETHER. THE DISCONNECT SWITCH TURNS ON THE SYSTEM. MAU-1 STARTS FIRST AND OPERATES FOR THE FIRST 5 MINUTES WITH 100% RETURN AIR. AFTER 5 MINUTES THE OUTSIDE AIR DAMPER BEGINS TO OPEN. WHEN THE OUTSIDE AIR DAMPER ACTUATOR END SWITCH CLOSURES (90 - 100% OPEN) THEN THE EXHAUST AIR DAMPER BEGINS TO OPEN. THE TEMPERATURE CONTROLLER'S MODULATE TO MAINTAIN SET POINT. IF THE SYSTEM'S TEMPERATURE DROPS BELOW SET POINT, A FREEZE STAT SHUTS DOWN THE SYSTEM. MIXED AIR DAMPERS WILL BE SET BY THE BALANCER TO PROVIDE 1200 CFM RETURN AIR AND 1800 CFM OUTSIDE AIR.

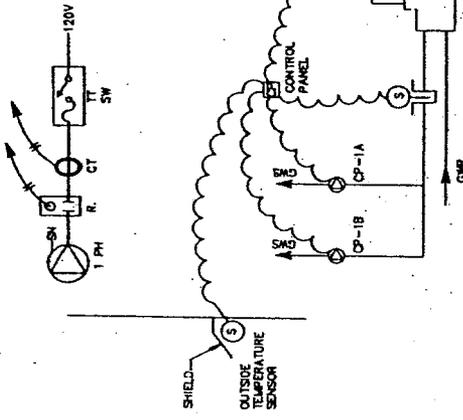
CONTROL COMPONENTS MODEL NUMBERS ARE "SEE ENVIRONMENTAL CONTROLS"



**MAKE-UP AIR UNIT ISOMETRIC DIAGRAM  
NOT TO SCALE**

NOTE 1: SET BYPASS BALANCE VALVE TO EQUAL COOL WATER PRESS. DROP.  
NOT TO SCALE

<b>Brown &amp; Root Services Corporation</b>		DATE: 07-01-86	SCALE: NO SCALE	SHEET NO: 18 OF 24
REVISION: M-8		FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 SQ. OP. MAU-1 & EF-1; MAU-1 FWS0270/807		
D.O.M.: CM	DRAWN BY: WIN	SCALE FACTOR: 1		



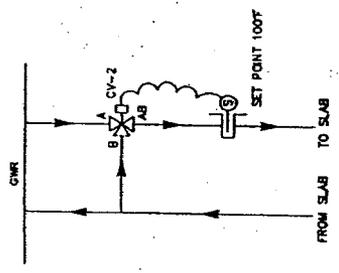
THE OUTSIDE TEMPERATURE SENSOR SENSES THE AMBIENT AIR TEMPERATURE. AT 65°F IT TURNS ON CP-1A. IF THE TEMPERATURE RISES TO 70°F, CP-1A CIRCULATES GLYCOL WATER SOLUTION. THEN IT TURNS OFF. WHEN THE TEMPERATURE FALLS TO 60°F, CP-1A CIRCULATES GLYCOL WATER SOLUTION. WHEN IT TURNS OFF, CP-1A CIRCULATES GLYCOL WATER SOLUTION. WHEN IT TURNS OFF, CP-1A CIRCULATES GLYCOL WATER SOLUTION. WHEN IT TURNS OFF, CP-1A CIRCULATES GLYCOL WATER SOLUTION.

HYDRONIC TEMPERATURE	AMBIENT AIR TEMPERATURE
100°F	65°F
160°F	67°F
180°F	-60°F

\*\* LIMIT @ 180°F

**SEQUENCE OF OPERATION,  
CP-1A, CP-1B, & HX-1**

GWS GLYCOL WATER SUPPLY  
GWR GLYCOL WATER RETURN

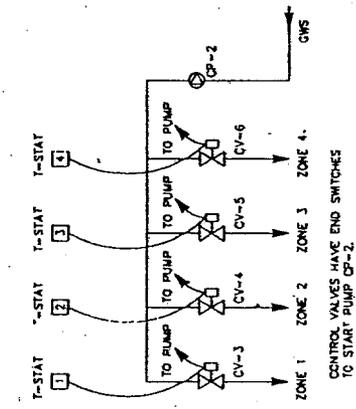


THE TEMPERATURE SENSOR IN THE GWS TO THE SLAB SENSES THE HYDRONIC FLUID TEMPERATURE. IF THE HYDRONIC FLUID TEMPERATURE IS BELOW THE SET POINT, THE 3-WATT VALVE CONTROLLER MODULATES TO MAINTAIN THE SET POINT TEMPERATURE.

CV-2, SEBE, VS-8313-201-4-6, VALVE CV = 6.5  
CONTROLLER: SEBE, SC-8111, 60 TO 160 °C CONTROLLER.

**SEQUENCE OF OPERATION,  
SLAB HEAT - 3-WAY VALVE**

GWS GLYCOL WATER SUPPLY



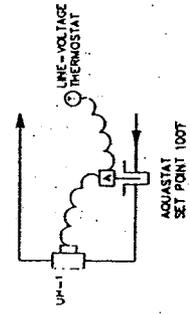
IF ANY ZONE THERMOSTAT CALLS FOR HEAT, CP-2 TURNS ON. THE ZONE VALVE FOR THAT ZONE OPENS. WHEN ZONE IS SATISFIED, THE CONTROL VALVE CLOSES. IF ALL THE ZONES HAVE REACHED THEIR SET POINT TEMPERATURE, & THE CONTROL VALVE CLOSES, THE PUMP IS TURNED OFF.

CV-3, CV-4, CV-5, CV-6: CONTROL VALVES  
SEBE, VA-1403-202-4-3  
T-STAT: SEBE, TC-1101

CONTROL VALVES HAVE END SWITCHES TO START PUMP CP-2.

**SEQUENCE OF OPERATION,  
SLAB HEATING**

GWS GLYCOL WATER SUPPLY  
T-STAT THERMOSTAT



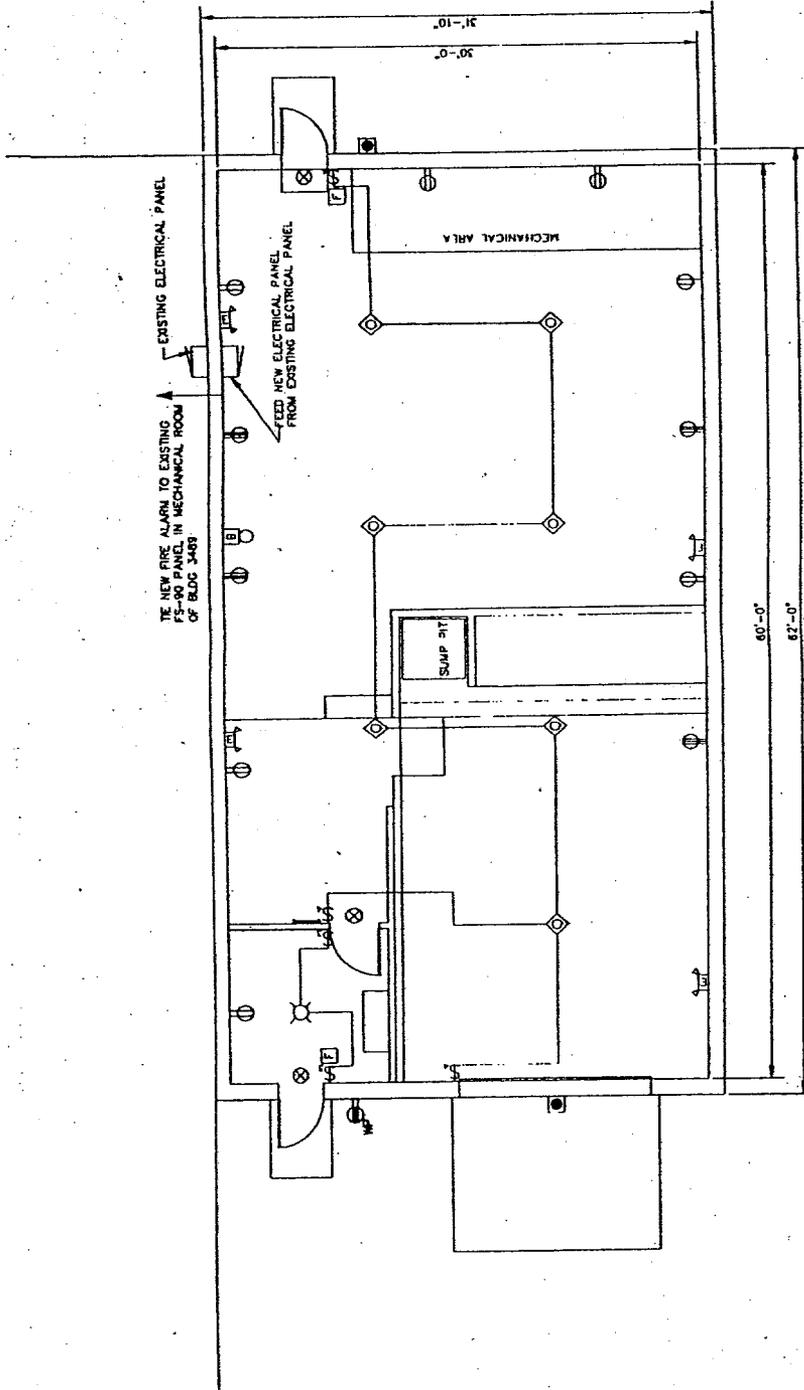
HYDRONIC GLYCOL SOLUTION BURNS W/O THROUGH THE HEATERS. UNIT HEATERS ARE CONTROLLED BY LINE-VOLTAGE THERMOSTAT WHICH IS INTERLOCKED TO THE AQUASTAT. IF THE HYDRONIC SOLUTION IS BELOW SET POINT TEMPERATURE, THE UNIT HEATER CANNOT TURN ON.

**SEQUENCE OF OPERATION,  
UNIT HEATER (UH-1)**

<b>Brown &amp; Root Services Corporation</b>		<b>DATE:</b> 07-01-86
<b>REVISION:</b>	<b>DRAWING NO:</b> M-9	<b>SCALE:</b> NO SCALE
<b>D.O.M.:</b> GM	<b>DESIGN BY:</b> WJN	<b>SHEET NO:</b> 20 OF 24
		<b>SCALE FACTOR:</b> 1

**FT. WADSWORTH, AK (JOC)  
DERA TREATMENT FACILITY/  
ADDITION TO BUILDING 3489  
OPERATION, SLAB HEAT & HX-1  
FW50270/807**





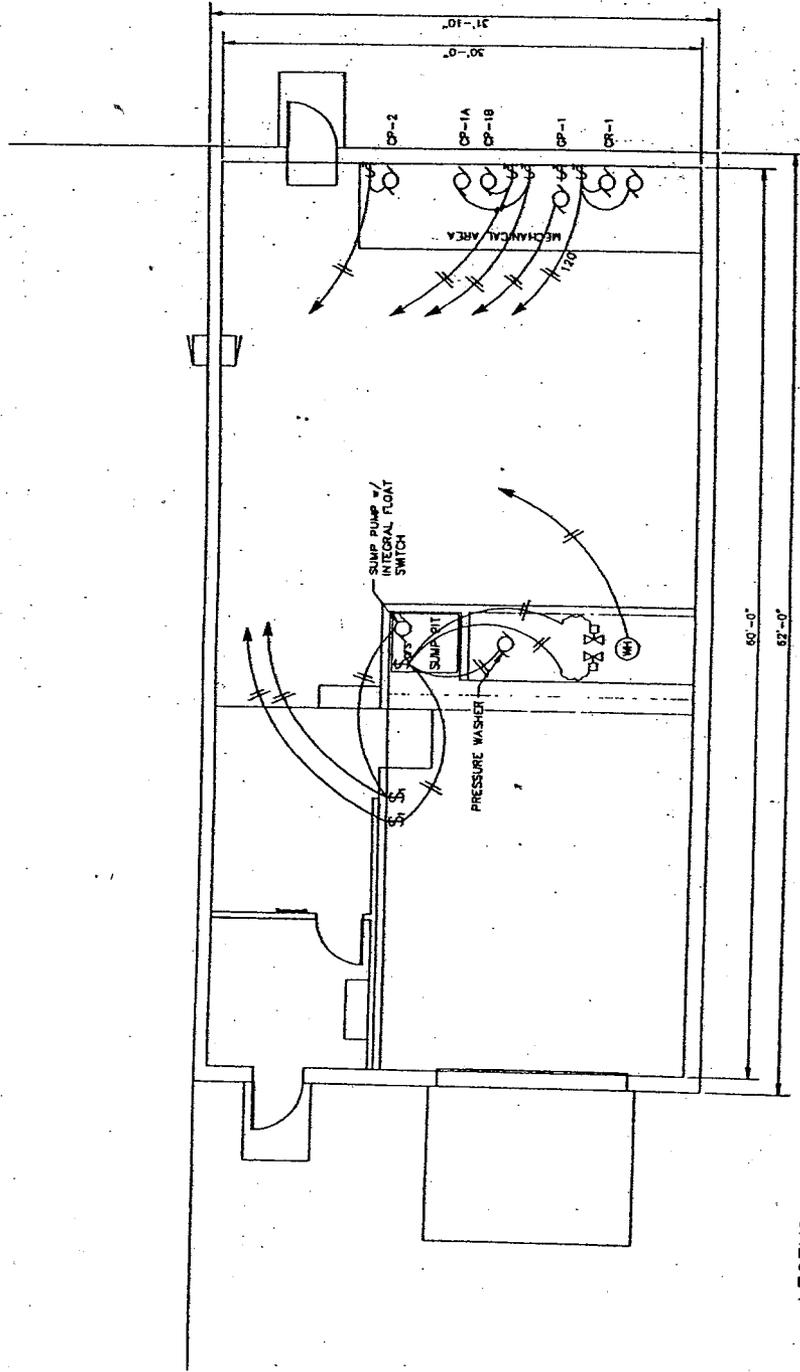
**LEGEND:**

- ⊗ EXIT LIGHT
- ⊕ 120V DUPLEX OUTLET
- ⊕ 240V DUPLEX OUTLET
- ⊕ 150W HIGH-PRESSURE SODIUM w/ PHOTOELECTRIC CELL
- ⊕ 60W HOUSEHOLD LIGHT FIXTURE
- ⊕ 120V DUPLEX OUTLET IN WEATHERPROOF ENCLOSURE
- ⊕ 240V DUPLEX OUTLET
- ⊕ ELECTRICAL PANEL
- ⊕ 150W LOW-BAY 120V MEDIUM WAX/FLUO. LIGHT FIXTURE
- ⊕ 150W HIGH-PRESSURE SODIUM w/ PHOTOELECTRIC CELL
- ⊕ 60W HOUSEHOLD LIGHT FIXTURE
- ⊕ EXIT LIGHT
- ⊕ 3-WAY SWITCH
- ⊕ 4-WAY SWITCH
- ⊕ EMERGENCY LIGHT w/ BATTERY BACK-UP
- ⊕ MANUAL FIRE-ALARM PULL-STATION HONEYWELL S484A 1043"
- ⊕ 10" FIRE-BELL HONEYWELL SC066C 1026"



**ELECTRICAL PLAN, GENERAL**  
1/8" = 1'-0"

<b>Brown &amp; Root Services Corporation</b>		DATE: 07-01-86
REVISION:		SCALE: 1/8" = 1'-0"
D.D.M.: GM	DRAWING NO: E-1	SHEET NO: 22 OF 24
PROJECT: FT. WAINWRIGHT, AK (JOC) DERA TREATMENT FACILITY, ADDITION TO BUILDING 3489 ELECTRICAL PLAN, GENERAL		SCALE FACTOR: 1
DRAWING NO: PW50270/807		



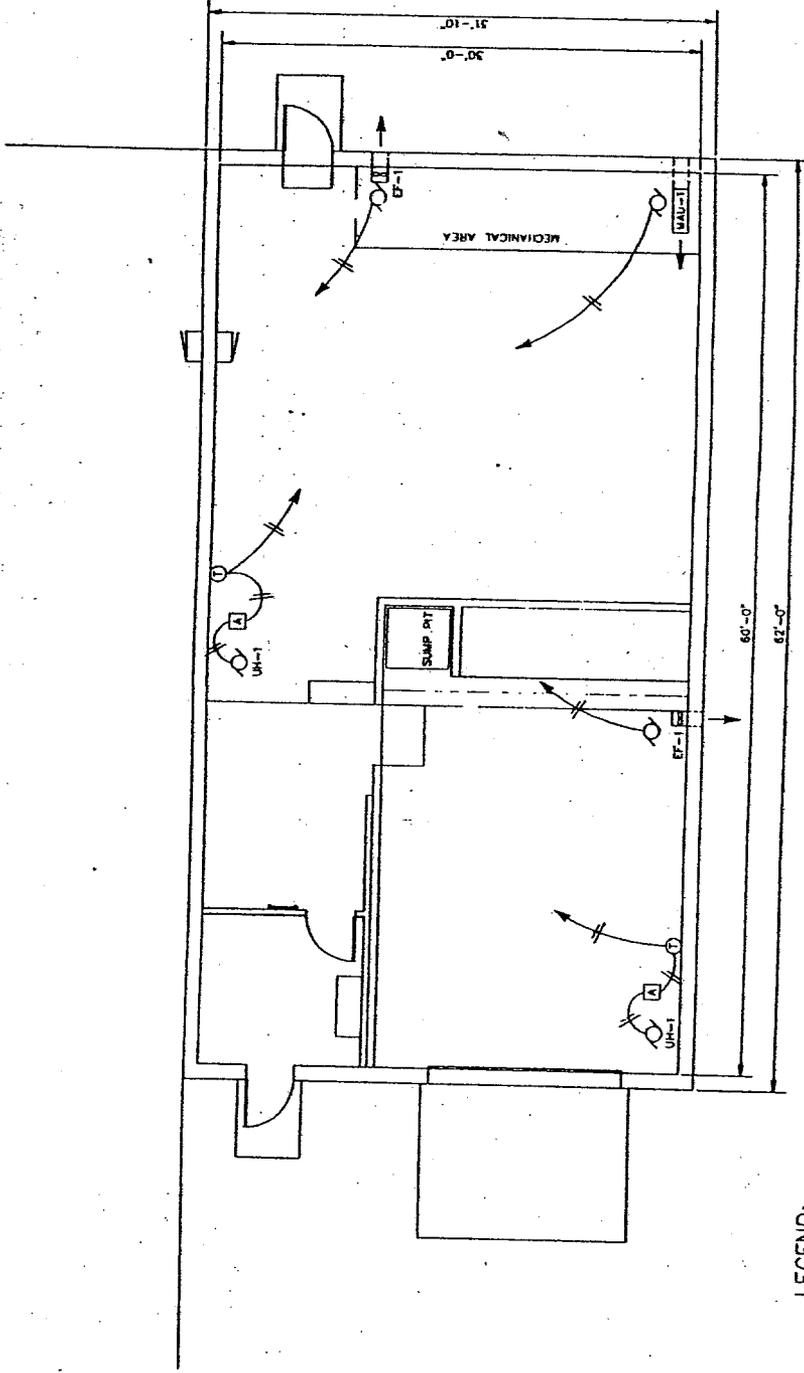
**LEGEND:**

- MOTOR
- WATER HEATER (WH-1)
- SOLONOID VALVE
- SINGLE-POLE SWITCH
- OVERFLOW FLOAT SWITCH
- HOME RUN
- ELECTRICAL PANEL

**ELECTRICAL PLAN, MECHANICAL CONTROLS**



<b>Brown &amp; Root Services Corporation</b>		<b>FT. WAINWRIGHT, AK (JOC)</b>	
REVISION:	DRAWING NO:	DERA TREATMENT FACILITY,	
	E-2	ADDITION TO BUILDING 3489	
D.D.M.:	DRAWN BY:	ELECTRICAL PLAN, MECH CONTROLS	
GM	WJN	PW50270/807	
		SCALE FACTOR: 1	SHEET NO: 23 OF 24
			DATE: 07-01-86
			SCALE: 1/8" = 1'-0"



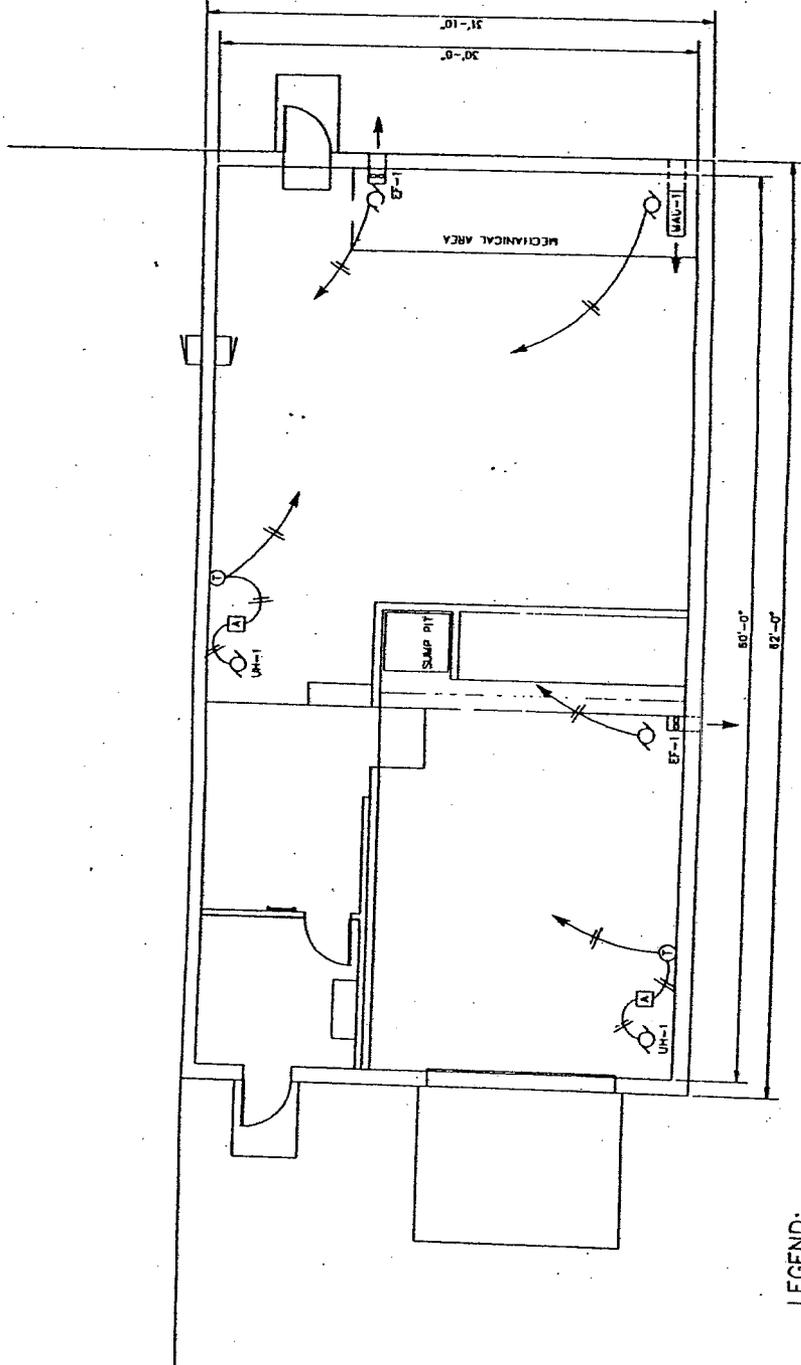
**LEGEND:**

- MOTOR
- ADJUST
- THERMOSTAT
- EXHAUST FAN (EF-1)
- MAKE-UP AIR UNIT (MAU-1)
- HOME RUN
- ELECTRICAL PANEL

**ELECTRICAL PLAN, HEATING & EXHAUST**  
1/8/81-8



<b>Brown &amp; Root Services Corporation</b>		<b>FT. WAINWRIGHT, AK (JOC)</b>	
REVISION:	DRAWING NO:	DERA TREATMENT FACILITY,	
	E-3	ADDITION TO BUILDING 3489	
D.O.M.:	DRAWN BY:	ELECTRICAL PLAN, HEAT & EXHAUST	
GM	WJN	FW50270/807	
			SCALE FACTOR: 1
			SHEET NO: 24 OF 2



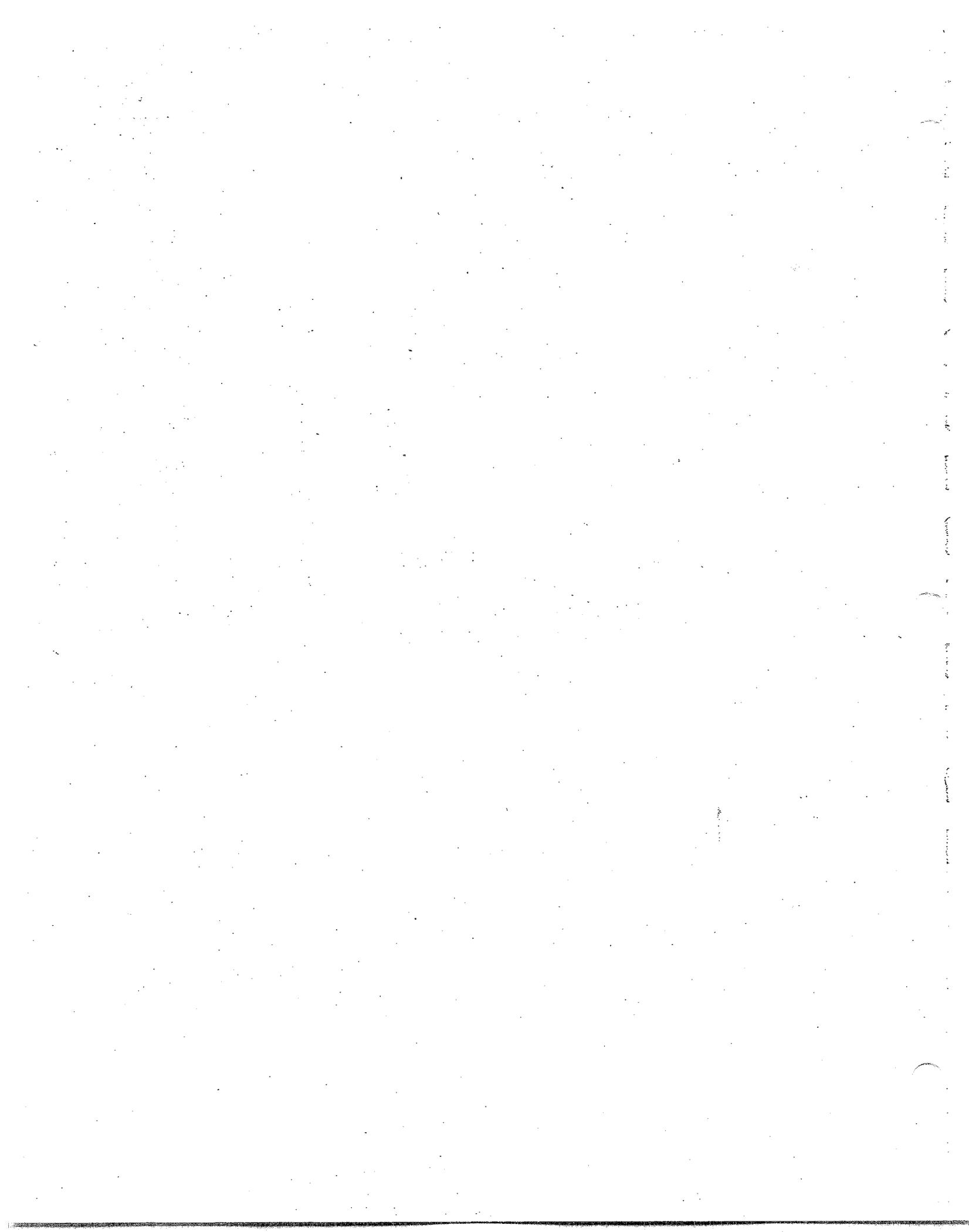
**LEGEND:**

- MOTOR
- AQUASTAT
- THERMOSTAT
- EXHAUST FAN (EF-1)
- MAKE-UP AIR UNIT (MAU-1)
- HOME RUN
- ELECTRICAL PANEL

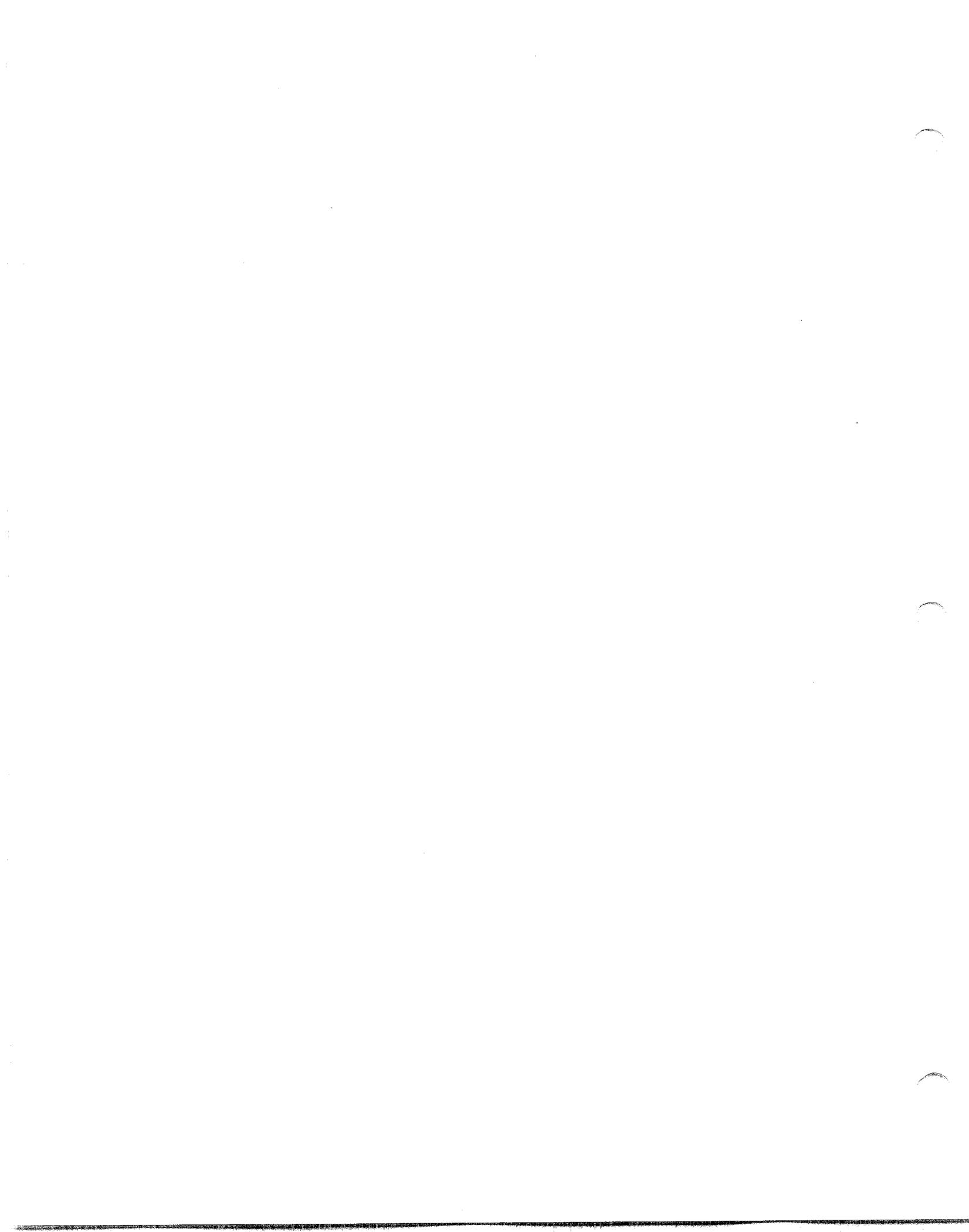
**ELECTRICAL PLAN, HEATING & EXHAUST**  
178'-11-0"

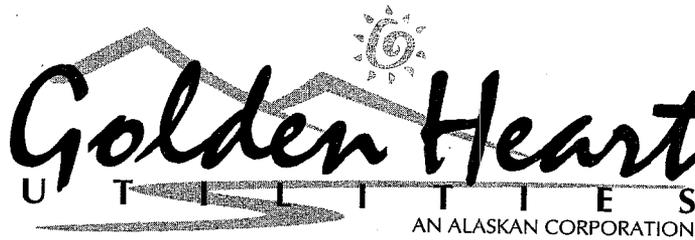


<b>Brown &amp; Root Services Corporation</b>		<b>FT. WAINTRIGHT, AK (JOC)</b>	
REVISION:	DRAWING NO: E-3	DERA TREATMENT FACILITY,	
DRAWING BY: GM	DESIGN BY: WJN	ADDITION TO BUILDING 3489	
		ELECTRICAL PLAN, HEAT & EXHAUST	
		FW00270/807	
		DATE: 07-01-98	SCALE: 1/8" = 1'-0"
			SHEET NO: 24 OF 24
			SCALE FACTOR: 1



**APPENDIX C**  
**DISCHARGE PERMIT**





PO Box 80370  
Fairbanks, AK 99708-0370

Phone: (907) 455-4448  
Fax: (907) 474-0619

May 29, 2003

Mark Kitter  
North Wind Environment, Inc.  
235 E. 8<sup>th</sup> Ave., Suite 210  
Anchorage, AK 99501

RE: SPECIAL DISCHARGE PERMIT NO. 03E-02

Dear Mr. Kitter:

Your request for a Wastewater Discharge Permit has been approved for a one-year period. Please review the terms and conditions of the permit carefully.

If you have any questions or comments, please call me at 907-455-0185.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Mabie".

Jeff Mabie  
Chemist/Industrial Pretreatment Coordinator

Attachment





**SPECIAL DISCHARGE PERMIT**

**Permit No. 03-E-02**

In accordance with the provisions of the Fairbanks General Code of Ordinances (FGC), Chapter 82 Utilities, Section 82.1-82.299, Golden Heart Utilities (GHU) tariffs, and the Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251 et seq.:

**Name:** North Wind Environmental, Inc.  
**Address:** 235 E. 8<sup>th</sup> Ave., Suite 210  
Anchorage, AK 99501

**Disposal Site:** US Army Ft. Wainwright  
Sanitary sewer system (Bldg 3489)

**Contact Person:** Mark Kitter  
**Phone:** (907) 277-5488  
**FAX:** (907) 277-5422

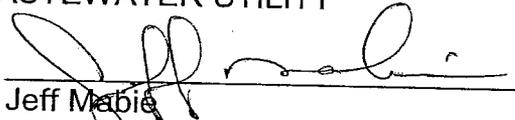
is hereby authorized to discharge domestic and industrial wastewater from the above-identified facility into GHU's sewage system in accordance with the conditions set forth in this permit. Compliance with this permit does not relieve the permittee of its obligation to comply with any or all applicable pretreatment regulations, standards or requirements under local, State and Federal laws, including any such regulations, standards, requirements, or laws that may become effective during the term of this permit.

Noncompliance with any term or condition of this permit shall constitute a violation of City of Fairbanks ordinances and GHU tariffs.

This permit shall become effective on June 2, 2003 and shall expire at midnight on June 1, 2004.

GHU WASTEWATER UTILITY

By:

  
Jeff Mabie  
Industrial Pretreatment Coordinator

Issued: 29 May 2003

## TERMS AND CONDITIONS

### 1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the treated wastewater holding tank and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water or substance. Monitoring points shall be not changed without notification to and the approval of the Industrial Pretreatment Coordinator.

### 2. Disposal Limitations

Permit shall be limited to the disposal of the wastewater from the monitoring well development purge water and monitoring well sample water from the Ft. Wainwright, Alaska site only.

### 3. Removed Substances

Solids, sludges, filter backwashes, or other pollutants removed in the course of treatment shall be disposed of in accordance with section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act.

### 4. Discharge Point

The treated wastewater shall be discharged into the Ft. Wainwright sewer system at a manhole adjacent to Building 3489 and the total volume discharged shall not exceed 5,000 gallons on any one day.

### 5. Monitoring Requirements

All collected wastewater shall be analyzed by a certified laboratory in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto, otherwise approved by EPA, or as specified by this permit. All limitations must be complied with. All wastewater will be analyzed for GRO, DRO, and BTEX. All other analytes identified below must be analyzed for, if suspected to be present at levels, which may exceed the stated fixed upper limits.

A.

Method	Analysis	Limits
EPA 8015m	Gasoline Range Organics (GRO)	25 mg/L
EPA 8100m	Diesel Range Organics (DRO)	25 mg/L
EPA 8260	Volatile Organic Compounds (VOC)	25 mg/L

EPA 8270	Semi-Volatiles	25 mg/L
EPA 8080	PCBs & Pesticides	0
EPA 8290	Dioxins	0
EPA 6010	Metals	Refer Below
EPA 7421	Lead	0.01 mg/L
EPA 7740	Selenium	Submit Results

B.

Fixed Upper Limits	
Metals	(mg/l)
Arsenic	4.35
Cadmium	0.33
Chromium (total)	1.23
Copper	3.38
Cyanide	1.20
Mercury	0.19
Nickel	4.74
Silver	0.43
Tin	5.0
Zinc	2.61

6. Correspondence or Reporting

All analytical results and all correspondence shall be sent to GHU, Wastewater Utility, 4247 Peger Road, Fairbanks, AK 99709-5468 or via fax at (907) 455-4467.

7. Inspection and Entry

GHU reserves the right to inspect the treatment operation, to take samples at any time throughout its operation, to shut down the operation for permit violations and reserves the right to cancel the manhole discharge provision at any time.

8. Notification

Name and phone number of a contact person at the Ft. Wainwright site shall be provided to GHU prior to commencing initial discharge. Notify the Industrial Pretreatment Coordinator within 24 hours of any changes in the treatment process, discharge amounts or equipment breakdowns that will affect the quality of the discharge.

9. Falsifying Information

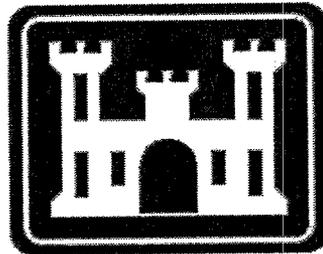
Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or a method inaccurate, is a crime and may result in the imposition of criminal sanctions and/or civil penalties.

**FINAL**  
**INVESTIGATIVE-DERIVED WASTE MANAGEMENT AREA**  
**SITE SAFETY AND HEALTH PLAN**

**FORT WAINWRIGHT, ALASKA**

**DACA85-02-C-0017**

**Prepared for:**



**Department of the Army**  
**U.S. Army Engineer District, Alaska**  
**P.O. Box 6898**  
**Anchorage, Alaska 99506-6898**

**Prepared by:**

*North Wind, Inc.*  
**235 East 8<sup>th</sup> Avenue, Suite 210**  
**Anchorage, Alaska 99501**

**August 2003**



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### LIST OF ATTACHMENTS

Attachment A	SSHP Sign-Off Sheet
Attachment B	Material Safety Data Sheets
Attachment C	Pre-Entry Briefing Attendance Sheet
Attachment D	USACE Accident Investigation Form

## LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ADEC	Alaska Department of Environmental Conservation
AL	action limit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGI	combustible gas indicator
DERA	Defense Environmental Restoration Account
DB	dry bulb temperature
DPW	U.S. Army Department of Public Works
FTW	Fort Wainwright
gpm	gallons per minute
GT	globe temperature
HAZWOPER	Hazardous Waste Operator
HSM	Health and Safety Manager
IDW	investigative derived waste
kV	kilovolts
LO/TO	lockout/tagout
MSDS	material safety data sheets
North Wind	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
OVM	organic vapor monitoring
PAH	polynuclear aromatic hydrocarbon
PEL	permissible exposure limit
PID	photoionization detector
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
ppm	parts per million
psi	per square inch
RCRA	Resource Conservation and Recovery Act

## LIST OF ACRONYMS (continued)

STEL	short term exposure limit
SSHO	Site Safety and Health Officer
SSHP	site safety and health plan
TLV	threshold limit value
TWA	time weighted average
USACE	U.S. Army Corps of Engineers
USARAK	U.S. Army, Alaska
WB	wet bulb temperature
WBGT	wet bulb globe temperature

## 1.0 INTRODUCTION

### 1.1 Site-Specific Safety and Health Plan Requirements

This Site-Specific Safety and Health Plan (SSHP) has been developed by North Wind, Inc. (North Wind) to establish the health and safety procedures required to minimize any potential risk to personnel who will operate the investigation-derived waste (IDW) management area at Fort Wainwright (FTW), Alaska. This SSHP was prepared under Contract No. DACA85-02-C-0017.

The provisions of this plan apply to all personnel who will potentially be exposed to safety and/or health hazards related to activities at the IDW Management Area. Each employee must sign a copy of the attached safety and health plan sign-off sheet (see Attachment A) to acknowledge that they have read and understood the SSHP and agree to abide by its requirements. Personnel covered by this SSHP who cannot or will not comply will be excluded from IDW Management Area activities.

This SSHP has been written to comply with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 Code of Federal Regulations [CFR] 1910.120), as well as guidance set forth in the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements, EM-385-1-1. All activities covered by this SSHP must be conducted in complete compliance with this SSHP; with individual contractors' safety policies and procedures; and with all applicable federal, state, and local health and safety regulations, including U.S. Army, Alaska (USARAK) Pamphlet 200-1 and, especially, 29 CFR 1910.120.

### 1.2 SSHP Modifications

This SSHP only pertains to activities conducted at the IDW Management Area.

The procedures in this SSHP have been developed based on current knowledge regarding the specific chemical and physical hazards, which are currently known or anticipated for the

operations to be conducted at the IDW Management Area. This information is based on information collected during other investigations at the installation. Should additional information become available regarding site hazards or should chemicals of concern at the IDW Management Area change, it may be necessary to modify this SSHP. All proposed modifications to this SSHP must be reviewed and approved by both the IDW Management Area operating contractor's and FTW health and safety personnel before such modifications are implemented.

Any significant modifications must be incorporated into the written document as addenda and the SSHP must be reissued. The operating contractor must ensure that all personnel covered by this SSHP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. The SSHP addenda should be distributed during the daily safety meeting so that they can be reviewed and discussed. Attendance forms will be collected during the meeting to document the review of new information.

### **1.3 Responsibilities**

Responsibility for the implementation of health and safety at the IDW Management Area is an integrated effort among the operating contractor and generating contractor and subcontractor employees.

The operating contractor is, by designation, the individual who has the primary responsibility for ensuring the overall health and safety at the IDW Management Area. The operating contractor therefore has the primary responsibility for ensuring the implementation of the requirements of this SSHP. The operating contractor's specific responsibilities include:

- ◆ Assuring that all personnel to whom this SSHP applies have access to a copy at the project site and have submitted a completed copy of the SSHP sign-off form;
- ◆ Assuring that all personnel to whom this SSHP applies have attended a pre-entry briefing prior to entering a restricted area;
- ◆ Assuring that personnel meet the medical surveillance and training requirements specified in Sections 8.1 and 8.2 of this SSHP and that subcontracted personnel submit documentation;

- ◆ Fostering a high level of health and safety awareness among employees at the IDW Management Area;
- ◆ Maintaining regular communications with the USACE project manager;
- ◆ Interfacing with FTW safety representatives on site;
- ◆ Procuring and distributing the personal protective equipment (PPE) needed for this project;
- ◆ Ensuring required air monitoring instrumentation is on-site;
- ◆ Performing the restricted area air monitoring required by this SSHP;
- ◆ Verifying that all PPE and health and safety equipment is in good working order;
- ◆ Notifying the operating contractor's corporate safety officer of all noncompliance situations and stopping work in the event that an immediate danger situation is perceived;
- ◆ Monitoring and controlling the safety performance of all personnel within the work areas to ensure that required safety and health procedures are being followed and correcting any deficiencies;
- ◆ Conducting the pre-entry briefing;
- ◆ Conducting accident/incident investigations and preparing accident/incident investigation reports; and
- ◆ Initiating emergency response procedures in accordance with Section 9.0 of this SSHP.

The operating contractor's corporate Health and Safety Manager (HSM) or his/her designee is responsible for the preparation, interpretation, and modification of this SSHP. Modifications to this SSHP that may result in less stringent precautions cannot be undertaken by the operating contractor without the approval of the operating contractor's HSM and USACE. Specific duties of the operating contractor's corporate safety officer or designee include:

- ◆ Writing and amending the SSHP for the IDW Management Area;
- ◆ Interviewing FTW personnel to identify any unique safety issues at the facility and to verify emergency response procedures at the Post;
- ◆ Advising the operating contractor on matters relating to health and safety on this site;
- ◆ Recommending appropriate PPE and air monitoring instrumentation to protect personnel from site hazards;
- ◆ Evaluating air monitoring and other data to determine if changing site condition warrant PPE changes (upgrading or downgrading);
- ◆ Performing site audits to monitor the effectiveness of this SSHP and to assure compliance with it; and

- ◆ Maintaining regular contact with the operating contractor to evaluate site conditions and new information that might require modifications to the SSHP.

All personnel working in the IDW Management Area are responsible for following the health and safety procedures specified in this SSHP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- ◆ Reading the SSHP in its entirety prior to the start of on-site work;
- ◆ Submitting a completed SSHP Acceptance Form and documentation of medical surveillance and training to the operating contractor prior to the start of work;
- ◆ Attending the required pre-entry briefing prior to beginning on-site work;
- ◆ Bringing forth any questions or concerns regarding the content of the SSHP to the operating contractor or the operating contractor's corporate safety officer prior to the start of work;
- ◆ Reporting all accidents, injuries, and illnesses, regardless of their severity, to the operating contractor; and
- ◆ Complying with the requirements of this SSHP and the requests of the operating contractor.

## 2.0 SITE DESCRIPTION

### 2.1 Facility History and Use

FTW is a U.S. Army installation located near the city of Fairbanks, Alaska. The IDW management facilities for Fort Wainwright are located in Buildings 3489 and 3476.

The liquid IDW treatment system is available for use only during normal working hours (Monday through Friday 0800 to 1700). It is located in a separate section on the southern side of Building 3489. This area has a garage door on the western end and man doors on both the east and west ends of the area. The garage door opens to a ramp descending to the receiving trench where contractors discharge their IDW water and decontamination rinsate. A pressure washer is provided for equipment decontamination and cleaning of the area. Treatment equipment, holding and settling tanks, filtration systems, and the drum crusher are located on a raised and bermed area above the receiving trench. Doors to the IDW water management area are left unlocked at all times with access controlled by the fence gates. Gates in the fenced area around Building 3489 are to be kept locked except during normal business hours. Access at other times can be arranged with the U.S. Army Department of Public Works (DPW) Environmental Resources in Building 3023 where a key can be signed out.

The IDW soil management facilities are located at Building 3476 and inside the fenced yard around the building. The building provides heated storage for liquid IDW awaiting analysis during the winter and storage for some contractor equipment. Contractors must arrange with the facility operator for access to the building and authorization for storage use. The fenced yard is used as an accumulation area for soil IDW awaiting analysis and for storage of drums to be used in Defense Environmental Restoration Account (DERA) investigations for soil IDW or water containment and transport. The gate to the IDW soil management and storage area in the fenced yard around Building 3476 is to remain locked except when in use.

## **2.2 Liquid IDW Treatment System**

The scope of work covered by this SSHP addresses the implementation and operation of a liquid IDW treatment system. The treatment system is designed to remove dissolved contaminants from water derived from contaminated site investigation tasks, such as well purging, decontamination, and other Post environmental and remediation activities.

The water treatment system consists of a receiving trench where IDW water is delivered by contractors, a 2,500-gallon cone-bottomed polyethylene settling tank, two submersible pumps, a 5-gallon per minute (gpm) flow regulator, two particulate filters and two media vessels, followed by two 1,200-gallon polyethylene post-treatment holding tanks.

The liquid IDW treatment system has been designed to remove dissolved contaminants from wastewater. The normal operating pressure of the treatment system is expected to be less than 30 pounds per square inch (psi). Greater pressures may arise when filters require changing or the treatment media requires servicing. Sludge will be removed from the receiving trench as it accumulates and from the cone-bottom pre-treatment tank at least annually. Additional wastes generated include the spent treatment media.

## **2.3 IDW Soil Management Facility**

The soil IDW management facility is located within the fenced yard around Building 3476. Drums containing soil IDW generated during investigations conducted on FTW are staged in this yard pending analysis and are identified for disposal options following the procedures presented in the FTW IDW Management Area Work Plan.

### 3.0 IDW MANAGEMENT AREA ACTIVITIES

The purpose of the IDW management system is to collect, characterize, and dispose of potentially contaminated soil and water generated during investigations conducted on FTW. The IDW soil management consists of accumulation and categorizing of IDW soil from site investigations, well installations, and small excavations where potentially contaminated soil is generated. Following receipt and review of analytical laboratory data, the drums are segregated for the appropriate disposal method to be used. Clean (currently defined as petroleum, oil, and lubricants [POL] concentrations less than Alaska Department of Environmental Conservation [ADEC] Level A) soil is transported to the FTW landfill on River Road. Resource Conservation and Recovery Act (RCRA)-contaminated soil is turned over to DPW Environmental Resources Services Contractor for disposal as hazardous or characteristic waste. POL-contaminated soil is transferred to a stockpile located behind the Building 3584 Chip Barn for thermal treatment. Analytical results for the clean soil must accompany transfer to the landfill, and analytical results for the POL-contaminated soil must be provided to DPW Environmental Resources and the thermal remediation contractor for approval prior to transfer to the stockpile. Analytical results for RCRA-contaminated soil are provided to the hazardous waste management contractor for assistance in characterization prior to transfer.

The liquid IDW treatment system is designed to pre-condition wastewater for discharge to the FTW sanitary sewer system and eventually the Golden Heart Utility sewer system. The objective of the treatment system is to remove dissolved contaminants to specified concentrations acceptable for discharge to the sewer. To meet this objective, the following field operations are implemented:

- ◆ Collect wastewater for treatment;
- ◆ Operate the treatment system per the Work Plan;
- ◆ Blow down and change particulate filter elements when necessary;
- ◆ Backflush the clay/anthracite vessel when pressure differential exceeds criteria detailed in Section 3.3.2 of the IDW Management Area Work Plan;
- ◆ Replace the treatment media as indicated by tracking analytical results for effective volatile organic compound removal;

- ◆ Collect water samples from post-treatment tanks after treatment of 1,200 gallons; and
- ◆ Collect samples of the sludge from the receiving trench and pre-conditioning tanks and the spent treatment media.

## 4.0 HAZARD ASSESSMENT

The following chemical and physical hazard assessment applies only to the activities covered by this SSHP. The list of chemicals of concern has been developed for the activities. This SSHP will be amended should additional information become available concerning the types of contamination present or suspected of being present at the IDW Management Area.

### 4.1 Potential Chemicals of Concern

The primary chemicals of concern expected to be encountered at the various sites at FTW include petroleum hydrocarbons associated with fuels, waste fuels, and waste oils. Other contaminants are present at the sites in more localized areas. These contaminants include:

- ♦ Ethylene glycol
- ♦ Polynuclear aromatic hydrocarbon (PAH) compounds associated with incomplete burning; and
- ♦ Chlorinated solvents.

Table 1 provides a summary of the action and exposure limits for the chemicals of concern.

**Table 1 Exposure Values for Chemicals of Concern**

Chemical	OSHA AL	OSHA PEL	ACGIH TLV	ACGIH STEL
Benzene	0.5 ppm	1 ppm	0.5 ppm	2.5 ppm
Ethylbenzene	N/A	100 ppm	100 ppm	125 ppm
Heptane	N/A	500 ppm	400 ppm	500 ppm
n-Hexane	N/A	500 ppm	50 ppm (as h-hexane)	N/A
Nonane	N/A	N/A	200 ppm	N/A
Tetrachloroethylene	300 ppm ceiling	200 ppm	25 ppm	100 ppm
Toluene	300 ppm ceiling	200 ppm	50 ppm	N/A
Trichloroethene	N/A	100 ppm	50 ppm	100 ppm
Xylene	N/A	100 ppm	100 ppm	150 ppm

ACGIH = American Conference of Governmental Industrial Hygienists  
 PEL = permissible exposure limit  
 STEL = short term exposure limit  
 N/A = not applicable

AL = action limit  
 ppm = parts per million  
 TLV = threshold limit value

#### **4.1.1 Petroleum Hydrocarbons**

Petroleum is a highly complex mixture of aliphatic and aromatic hydrocarbons. Benzene, toluene, ethylbenzene, and xylenes are natural but minor components of fuel oils, kerosene, and diesel fuels. Gasoline contains higher quantities of these aromatic hydrocarbons. These compounds have been identified in soil and groundwater at numerous underground storage tank and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation sites at FTW.

Exposure to the vapors of benzene, toluene, ethylbenzene, and xylenes above their respective permissible exposure limits (PELs) as an 8-hour time-weighted average (TWA) may produce irritation of the mucous membranes of the upper respiratory tract, nose, and mouth. Overexposure may also result in the depression of the central nervous system. Symptoms of such exposure include drowsiness, headache, fatigue, and drunken-like behaviors. Chronic and prolonged overexposure to the vapors of benzene may cause damage to the blood-forming organs and is known to cause leukemia in humans.

Aliphatic hydrocarbons are asphyxiants and central nervous system depressants. Aliphatic hydrocarbons with higher molecular weights, such as heptane, octane, nonane, and decane, cause narcosis. Hexane has neurotoxic properties. Another common effect is irritation of the skin and mucous membranes of the upper respiratory tract. Repeated or prolonged skin contact may result in dermatitis due to defatting of the skin. Exposure limits have not been developed for all of the aliphatic hydrocarbons.

#### **4.1.2 Ethylene Glycol**

Ethylene glycol is a clear, colorless, odorless, syrupy liquid that lowers the freezing point of water. Ethylene glycol is used as a coolant and antifreeze and is commonly used as a deicer on airplanes and airport runways. Ethylene glycol was probably also used in the airfield and airport hangars. Ethylene glycol's vapor pressure is such that at room temperatures toxic concentrations are unlikely to occur.

### **4.1.3 PAH Compounds**

PAH compounds may be found in soils or groundwater at various hazardous waste sites. PAHs are a family of multiple-ring aromatic compounds commonly found in fossil fuels and formed from the incomplete combustion and pyrolysis of organic materials. Because of the relatively low vapor pressures of PAH compounds, they are not expected to pose an inhalation hazard to the field team at ambient outdoor temperatures. However, because of the potential for absorption through the skin, protective clothing will be required when handling contaminated soils.

### **4.1.4 Chlorinated Solvents**

Tetrachloroethylene is a common dry cleaning solvent. Short-term exposure to the vapors of tetrachloroethylene above this established PEL may result in central nervous system depression. Symptoms include headache, nausea, drowsiness, dizziness, or incoordination. It may also cause irritation of the eyes, nose and throat, and flushing of the face. Repeated or prolonged overexposure may cause liver damage and/or kidney injury as well as central nervous system disorders. The International Agency for Research on Cancer has concluded that tetrachloroethylene causes cancer in animals.

Other chlorinated solvents, such as trichloroethene, may have been used at the FTW as degreasers. Most chlorinated solvents cause the same toxic effects as tetrachloroethylene, including central nervous system depression.

Chlorinated solvents have been encountered during investigations of operable unit sites where used solvents or wash solvents were stored.

### **4.1.5 Other Chemicals at the IDW Management Area**

Material safety data sheets (MSDS) for the decontamination solutions that North Wind will use during the operation of the treatment system are provided in Attachment B of this document. It is the operating contractor's responsibility to ensure that all containers of decontamination solutions are labeled in accordance with OSHA's Hazard Communication Standard. The most likely route

of exposure to these solutions is through direct dermal contact, although a splash hazard is also possible. To reduce the potential for contact with the decontamination solutions, PPE, as described in Section 6.1 of this SSHP, will be worn.

## **4.2 Physical Hazards**

The following physical hazards have been identified for the operations and activities at the IDW Management Area.

### **4.2.1 Cold Stress**

Cold injury is classified as either localized, as in frostbite, frostnip, or chilblain, or generalized, as in hypothermia. The main factors contributing to cold injury are exposure to humidity and high winds, contact with wetness, and inadequate clothing.

The likelihood of developing frostbite occurs when the face or extremities are exposed to a cold wind in addition to cold temperatures. The freezing point of the skin is about 30°F. The fluids around the cells of the body tissue freeze, causing the skin to turn white. This freezing is due to exposure to extremely low temperatures. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly. The first symptom of frostbite is usually an uncomfortable sensation of coldness, followed by numbness. There may be a tingling, stinging, or aching feeling in the effected area. The most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes.

Symptoms of hypothermia, a condition of abnormally low body temperature, include uncontrollable shivering and sensations of cold. The heartbeat slows and may become irregular, the pulse weakens, and the blood pressure changes. Pain in the extremities and severe shivering can be the first warnings of dangerous exposure to cold.

Maximum severe shivering develops when the body temperature has fallen to 95°F. This must be taken as a sign of danger, and exposure to cold must be immediately terminated. Productive physical and mental work is limited when severe shivering occurs.

When the ambient temperature, or a wind chill equivalent, falls to below 40°F (ACGIH recommendation), site personnel who must remain outdoors should wear insulated coveralls, insulated boot liners, hard hat helmet liners, and insulated hand protection. Wool mittens are more efficient insulators than gloves. Keeping the head covered is very important, since 40 percent of body heat can be lost when the head is exposed. If it is not necessary to wear a hard hat, a wool knit cap provides the best head protection. A face mask may also be worn.

Persons should dress in several layers rather than one single heavy outer garment. The outer piece of clothing should ideally be wind and water proof. Clothing made of thin cotton fabric or synthetic fabrics, such as polypropylene, is ideal since it helps to evaporate sweat. Polypropylene is best at wicking away moisture while still retaining its insulating properties. Loosely fitting clothing also aids in sweat evaporation. Denim is not a good protective fabric. It is loosely woven, which allows moisture to penetrate. Socks with high wool content are best. If two pairs of socks are worn, the inner sock should be smaller and made of cotton, polypropylene, or a similar type of synthetic material that wicks away moisture. If clothing becomes wet, it should be taken off immediately and a dry set of clothing put on. If wind conditions become severe, it may become necessary to shield the work area temporarily. The operating contractor will determine if this type of action is necessary.

Dehydration occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Personnel should drink sufficient fluids to prevent dehydration, but avoid excess caffeine from coffee, tea, or soft drinks.

#### **4.2.2 Heat Stress**

Sweating does not cool the body unless moisture evaporates from the skin. Wearing PPE reduces the body's ability to eliminate large quantities of heat since sweat evaporation is decreased. Therefore, PPE may impair the body's efforts to maintain an acceptable temperature and result in heat stress.

Problems related to heat stress include heat fatigue, heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Heat rash occurs when sweat does not evaporate, causing the skin to be wet for an extended period of time. Standing erect and immobile in heat also allows blood to pool in lower parts of the body. As a result, blood does not return completely to the heart to be pumped to the brain. Fainting may then occur.

Heat cramps are painful spasms of the muscles caused by excessive salt loss associated with profuse sweating. Losing large amounts of fluid and salt may result in heat exhaustion. The skin will be clammy and moist. Affected persons will also exhibit extreme perspiration, giddiness, nausea, and headache.

Heat stroke occurs when the body's temperature regulatory system has failed. Symptoms of heat stroke include hot, dry, red, and/or spotted skin. The affected person may be mentally confused and delirious. Convulsions could also occur. **EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.** A person exhibiting signs of heat stroke should be removed from the work area to a shaded area. The affected person should also be soaked with water to promote evaporation. Fan the person's body to stimulate cooling.

Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

Early symptoms of heat-related health problems are as follows:

- ♦ Decline in task performance;
- ♦ Excessive fatigue;
- ♦ Uncoordination;
- ♦ Decline in alertness;
- ♦ Unsteady walk;
- ♦ Dizziness; and
- ♦ Muscle cramps.

An increase in susceptibility to heat stress may be caused by the following:

- ◆ Lack of physical fitness;
- ◆ Lack of acclimation;
- ◆ Increased age;
- ◆ Dehydration;
- ◆ Obesity;
- ◆ Drug or alcohol use;
- ◆ Sunburn; and
- ◆ Infection.

People unaccustomed to heat are particularly susceptible to heat fatigue. First timers in PPE need to gradually adjust to the heat. Measures to avoid heat stress are as follows:

- ◆ Establish work-rest cycles (short and frequent).
- ◆ Identify a shaded, cool rest area.
- ◆ Rotate personnel and alternate job functions.
- ◆ Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. **DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK.** For an 8-hour work day, drink 50 fluid ounces of fluids.
- ◆ Save the most strenuous tasks for non-peak heat hours such as the early morning or at night.
- ◆ Avoid drinking alcohol during exposure to prolonged periods of heat. Alcohol will cause additional dehydration.
- ◆ Avoid double shifts and/or overtime.

The implementation and enforcement of the above-mentioned measures will be the joint responsibility of the facility operator and his health and safety personnel. Potable water and/or Gatorade should be available each day for the field team.

Site personnel should also monitor their heart rate as an indicator of heat strain by the following method:

Radial pulse rates should be checked by using the first two fingers, applying light pressure to the pulse in the wrist for 1 minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beats/minute, the next work cycle will be shortened by one-third and the rest period will be kept the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, the work cycle will be shortened again by one-third. The SSHO is responsible for recording pulse rates and altering the work-rest cycles as needed.

Experience has shown that the work/rest regimen shown in Table 2 is appropriate for field workers performing light/moderate work outdoors while wearing Level D, no protective clothing.

**Table 2 Heat Stress Work/Rest Table**

<b>Work/Rest Regime (each hour)</b>	<b>WBGT Values (°C)</b>
Continuous Work	25
75% work / 25% rest	27
50% work / 50% rest	31
25% work / 75% rest	39

WBGT (wet bulb globe temperature) is defined according to the following formula (outdoors):

$$WBGT = 0.7WB + 0.2GT + 0.1DB$$

Where WB, GT, and DB are the wet bulb, globe, and dry bulb temperatures, respectively.

#### **4.2.3 Operation of Heavy Equipment**

Use of a forklift with a drum dumping attachment to move and empty the soil IDW drums will be required. Only persons who have completed forklift training and are certified in the operation of heavy equipment will be permitted to operate it. The process of transferring soil IDW from drums to a dump truck for transport to the landfill or POL stockpile involves clasping the open-top drum to the dumping attachment, hoisting the drum with the forklift over the dump truck, rotating the dumping attachment, assuring the soil is all dumped using a shovel, and returning the empty drum to the ground for decontamination or rinsing.

Drums will also require moving and relocation using a drum dolly. Care must be used to assure the drum is correctly positioned and clamped at the rim prior to tipping onto the wheels for transport.

While operating the heavy equipment and working at the IDW Management Area, personnel will wear steel-toed footwear, hard hats, hearing protection, and safety eyewear. Personnel should not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Personnel will not walk behind the forklift while operating. All industrial vehicles will be equipped with a backup alarm or signal. All activities will be conducted in accordance with 29 CFR 1910.178, Powered Industrial Trucks.

#### **4.2.4 Electrical Hazards**

- ◆ Electrical wiring and equipment shall be de-energized prior to conducting work. All electrical work will be performed in accordance with 29 CFR 1910.331, Electrical Standards for General Industry, or 29 CFR 1926.416, Electrical Standards for Construction.
- ◆ Only authorized personnel are permitted to enter high-voltage areas.
- ◆ Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout (LO/TO) procedures are implemented.
- ◆ Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment; remove from service.
- ◆ All temporary wiring, including extension cords, electrical power tools, and pressure washer must have ground fault circuit interrupters installed in line.
- ◆ Extension cords must be:
  1. Equipped with third-wire grounding;
  2. Covered, elevated, or protected from damage when passing through work areas;
  3. Protected from pinching if routed through doorways; and
  4. Not fastened with staples, hung from nails, or suspended with wire.
- ◆ Electrical power tools and equipment must be effectively grounded or double-insulated and Underwriters Laboratory approved.
- ◆ Operate and maintain electric power tools and equipment according to manufacturers' instructions.

- ◆ Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact.
- ◆ Maintain at least 10 feet from overhead power lines for voltages of 50 kilovolts (kV) or less, and 10 feet plus a ½-inch for every 1 kV over 50 kV.
- ◆ Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- ◆ Protect all electrical equipment, tools, switches, and outlets from environmental elements.
- ◆ Utilize rated electrical equipment where required.

#### **4.2.5 Control of Hazardous Energy**

- ◆ All LO/TO activities shall meet the requirements of 29 CFR 1910.147, The Control of Hazardous Energy (lockout/tagout).
- ◆ Do not work on equipment when unexpected operation could result in injury, unless LO/TO procedures are implemented.
- ◆ North Wind staff working under a LO/TO procedure must have completed the North Wind LO/TO training course. Project-specific training may also be required on site-specific LO/TO procedures.
- ◆ North Wind activities requiring LO/TO will follow ESH-012, *Control of Hazardous Energy (LO/TO)*. Subcontractors must follow their own LO/TO procedure. The Site Safety and Health Officer (SSHO), in conjunction with the corporate HSM, will review all Subcontractor LO/TO procedures prior to use. Where North Wind personnel are performing work on a locked out/tagged out system (authorized worker) or are in the area (affected worker) controlled by another contractor, they will be provided a status of the system prior to performing work on the system or entering the area in accordance with 29 CFR 1910.147.
- ◆ All safeguards must be put back in place, all affected personnel notified that LO/TO has been removed, and controls positioned in the safe mode prior to LO/TO removal.
- ◆ Do not remove another person's lock or tag, and never relinquish control of the key to your personal lock.

#### **4.2.6 Fire Prevention**

- ◆ Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be located within 50 feet. Extinguishers must:
  1. Be maintained in a fully charged and operable condition;

2. Be visually inspected each month; and
  3. Undergo a maintenance check each year.
- ◆ The area in front of extinguishers must be kept clear.
  - ◆ Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
  - ◆ Combustible materials stored outside should be at least 10 feet from any building.
  - ◆ Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
  - ◆ Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

#### **4.2.7 Back Strain**

Mechanical lifting devices will be used whenever practice to prevent back strain injuries. When lifting is required, proper techniques will be used as described below. Personnel will not attempt to lift objects that are awkward or more than 50 pounds or one-third of a person’s body weight (whichever is less) without assistance from a second person. The following precautions should be implemented when lifting or moving heavy objects.

- ◆ Bend at the knees, not the waist. Let your legs do the lifting.
- ◆ Do not twist while lifting.
- ◆ Bring the load as close to you as possible before lifting.
- ◆ Be sure the path you are taking while carrying a heavy object is free of obstructions and slip, trip, and fall hazards.
- ◆ Use mechanical devices to move objects that are too heavy to be moved manually.
- ◆ If mechanical devices are not available, ask another person to assist you.

#### **4.2.8 Struck-by, Caught-Between, Pinch Points, and Overhead Hazards**

Personnel performing IDW operations will be exposed to numerous potential safety hazards from operating equipment, drum crushing operations, material handling, and other industrial safety hazard sources. Personnel will maintain body position awareness at all time and not place themselves in a position that could result in a struck-by/caught-between injury. All operating equipment and tools will be properly guarded in accordance with 29 CFR 1910, Subpart O,

Machinery and Machine Guarding. Personnel will wear required PPE to mitigate pinch point and overhead hazards.

Table 3 summarizes the hazards associated with implementing each of the IDW system implementation tasks.

**Table 3 Task Hazard Analysis**

<b>Task</b>	<b>Hazards</b>	<b>Protective Measures</b>
IDW Management Area Operation	Cold stress, heavy equipment, utilities, lifting, traffic, heat stress	Warm clothing, protective gear, marking/clearance, practice back safety tips, wear traffic vests/ signage, use protective clothing, drink plenty liquids
Wastewater Sampling	Cold stress, lifting, dermal contact with contamination, heat stress	Warm clothing, practice back safety tips, use protective clothing, drink plenty liquids
Sludge/Media Sampling	Cold stress, lifting, dermal contact with contamination, inhalation of contaminated materials, heat stress	Warm clothing, practice back safety tips, use protective clothing, air monitoring/respiratory protection, drink plenty liquids

#### 4.2.9 General Work Practices and Housekeeping

- ◆ Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness requires sufficient illumination intensity to read a newspaper without difficulty.
- ◆ Good housekeeping must be maintained at all times in all project work areas.
- ◆ Common paths of travel should be established and kept free from the accumulation of materials.
- ◆ Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- ◆ Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- ◆ Specific areas should be designated for the proper storage of materials.
- ◆ Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- ◆ As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- ◆ Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.

- ◆ Oil and grease from routine operations and maintenance activities shall be cleaned from walking and working surfaces to reduce slip hazard.
- ◆ All housekeeping tasks will be conducted in accordance with 29 CFR 1926.25, Housekeeping.

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## 5.0 AIR MONITORING

Although air monitoring is not expected to be required during normal operation of the IDW management area, it is possible that highly volatile contaminants may be introduced to the breathing zone of the operator.

### 5.1 Direct Reading Instructions

#### Instrument 1: Photoionization Detector such as a Photovac 2020

A photoionization detector (PID) is an organic vapor monitoring (OVM) device and may be used to screen the breathing zone of employees.

#### Instrument 2: Draeger Pump Kit with Benzene 5/a tubes

If the OVM indicates the presence of petroleum hydrocarbons in the breathing zone of employees, it will be necessary to use the Draeger pump kit equipped with benzene tubes to determine if benzene is present in the breathing zone.

#### Instrument 3: Combustible Gas Indicator

A combustible gas indicator (CGI) may be used to screen the work areas for the presence of methane and potentially explosive atmospheres.

### 5.2 Action Levels

If breathing zone concentrations of the chemicals of concern are sustained for 2 minutes at or above the action levels (but below the short-term exposure limit or ceiling values), the area will be evacuated, engineering controls utilized to mitigate the hazard (e.g., ventilation) or respiratory protection donned (as described in Section 6.2) if operations are essential and the hazard can not feasibly be eliminated with engineering controls. The action levels are presented in Table 4.

**Table 4 Air Monitoring Action Levels**

<b>Contaminant</b>	<b>Action Level</b>	<b>Instrument</b>
Benzene	1 ppm	Draeger Pump Kit
Chlorinated Solvents	25 ppm (as tetrachloroethylene)	PID
Methane	>10% lower explosive limit of methane	CGI
Petroleum Hydrocarbons	50 ppm (as toluene) (in the absence of benzene)	PID

Hexane has the lowest PEL of all the common aliphatic hydrocarbons; therefore, this action level is the most protective (in the absence of benzene).

Because of the low exposure limit of benzene, it is not easily detected by the PID (PEL would be indicated by a barely noticeable meter deflection). Therefore, PID readings will be supplemented with specific colorimetric detector tubes to detect the presence of benzene. Draeger tube readings for benzene will be taken in the breathing zone of employees when the PID indicates sustained breathing zone concentrations of 10 parts per million (ppm) above background. Should Draeger tube readings indicate that breathing zone benzene levels are 1 ppm or higher, protective actions will be taken as described above. In the absence of benzene, the action level for donning respiratory protection in petroleum-contaminated areas is 50 ppm based on the threshold limit value for toluene as previously defined.

When working in areas where chlorinated solvent contamination is anticipated, the action level for donning respiratory protection is 25 ppm. This action level is based on the PEL of tetrachloroethylene and its reported relative response to the PID. Tetrachloroethylene has the lowest PEL of the common chlorinated solvents; therefore, this action level is the most protective during investigations in areas that may have been impacted by chlorinated solvents.

Air monitoring action levels are summarized in Table 4.

### **5.3 Equipment Calibration**

Equipment calibration procedures will be in accordance with each manufacturer's operating procedures. The Draeger pump will be leak-checked on a daily basis in accordance with the manufacturer's instructions. The CGI will be factory-calibrated to methane and checked daily against a 25 percent lower explosive limit pentane-in-air calibration standard.

## **6.0 PERSONAL PROTECTIVE EQUIPMENT**

PPE will be donned as described below for activities at the IDW Management Area to protect employees from coming in direct contact with contamination.

It has been assumed that all liquid IDW is contaminated and PPE will be required. However, if the likelihood of coming in direct contact with the contaminated material is minimal, the use of PPE may not be necessary. The operating contractor will decide when it is appropriate to downgrade the level of protective clothing. Similarly, it may be necessary to upgrade the type of PPE being worn for a specific task. If, for example, free product or highly contaminated water is encountered, it may be necessary to wear polycoated Tyvek® or equivalent, which offers more protection from liquids. The operating contractor will determine when an upgrade in protection is necessary.

### **6.1 Protective Clothing**

1. Hard Hat
2. Safety Glasses/Splash Guard or face shield
3. Steel-toed work boots or steel-toed rubber boots
4. Work coveralls or coated Tyvek® coveralls or equivalent
5. Nitrile gloves
6. Leather gloves
7. Hearing Protection (if noise levels are greater than 85 decibels)
8. Traffic Vest (when working around operating industrial equipment or vehicles).

If a pressure washer is used to decontaminate used drums for reuse, pretreatment tank or heavy equipment, a hooded splash suit and face shield will be worn in addition to the above items by the worker performing the decontamination or other nearby workers.

### **6.2 Respiratory Protection**

Respiratory protection may be required during transfer of POL-contaminated soil IDW from drums into the dump truck for transport to the thermal treatment stockpile. Personnel will

position themselves in an upwind direction of the transfer operation to minimize exposure to contaminated dust. Respiratory protection is not expected to be required for normal operation of the liquid IDW treatment system. However, if air monitoring indicates that respiratory protection is necessary, the following will be worn:

**Level C: Half-face air purifying respirator with organic vapor cartridges**

Respiratory protection will be donned as indicated in the table below:

Contaminant	Action Level*	Instrument
Benzene	1 ppm	Draeger Pump Kit
Chlorinated Solvents	25 ppm (as tetrachloroethylene)	PID
Petroleum Hydrocarbons	50 ppm (as toluene) (in the absence of benzene)	PID

\*At 10 ppm benzene or 50 ppm read on the PID, respiratory protection should be upgraded to a full-face air purifying respirator. Work will stop at the site and the facility operator, Corporate Safety Personnel and USACE PM will discuss the changing site conditions and modification of this plan. Work will not resume until the site is reevaluated and risks are determined.

All employees who are expected to wear respiratory protection must have successfully passed a respirator fit-test and have medical clearance within the last year. All North Wind personnel will follow North Wind ESH-007, *Respiratory Protection* requirements.

**6.3 Other Safety Equipment**

The following additional safety equipment is stored at the IDW Management Area on the equipment table located on the north wall:

- ◆ First aid kit;
- ◆ Spill kit;
- ◆ Portable, hand-held eyewash bottle; and
- ◆ 10-pound A-B-C type fire extinguishers.

First aid kits and fire extinguishers will be inspected monthly to ensure adequate supplies are available.

In addition to wearing the PPE, the following precautions must be followed by all employees required to operate the liquid IDW treatment system:

- ◆ Eye wash bottles and first aid kits will be kept in the facility. If an employee is cut while operating the treatment system, the affected area will be immediately disinfected and a bandage applied to the wound. All injuries, accidents or first aid cases will be reported using a North Wind Form-520, Incident Report Form.
- ◆ Once treatment system operation is finished, all equipment leaving the IDW Management Area will be immediately decontaminated. Personnel will remain in PPE during equipment decontamination.
- ◆ Once system operation activity is complete, personnel will immediately remove and dispose of used PPE.
- ◆ Antibacterial towelettes will be kept in the facility. Personnel must minimally wash their face and hands and any other part of their body that may have contacted the affected water.
- ◆ Toilet facilities will be provided in the work area or adjacent facilities.
- ◆ Personnel will practice good personal hygiene and not eat, smoke, chew, or participate in any other activity that could result in ingestion of contaminants in the workplace. Personnel will only be allowed to eat and smoke in designated areas.

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## 7.0 DECONTAMINATION

Proper decontamination is required of all personnel and equipment before leaving the IDW Management Area. Personnel decontamination will be accomplished by following a systematic procedure of removing PPE. The decontamination procedures for sampling equipment are presented in the FTW IDW Management Area Work Plan. All decontamination tasks, where required, will be conducted in accordance with 29 CFR 1910.120, Hazardous Waste Operator (HAZWOPER) training.

Disposable PPE, such as Tyvek® coveralls and gloves, etc., will be disposed of in accordance with Section 5.0 of the FTW IDW Management Area Work Plan.

### Decontamination Procedures

1. Remove and wipe clean hardhat and safety glasses (if worn, if not, skip to item No. 2)
2. Scrub boots
3. Remove outer gloves
4. Remove work coveralls or Tyvek® coveralls
5. Remove respirator (if worn, if not, skip to item No. 6)
6. Remove inner gloves.

Decontamination fluids will be discharged to the receiving trench in the liquid IDW treatment facility.

Respirators will be cleaned and stored in accordance with North Wind ESH-007, *Respiratory Protection* requirements.

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## **8.0 MEDICAL MONITORING/TRAINING REQUIREMENTS/SITE CONTROL**

### **8.1 Medical Monitoring**

All personnel performing activities at the IDW Management Area must be active participants in a medical monitoring program that complies with 29 CFR 1910.120(f). Each individual must have completed an annual surveillance examination and/or an initial baseline examination within the last year prior to performing any work at the IDW Management Area. No site-specific monitoring is required.

### **8.2 Training**

Additionally, all personnel performing activities at the IDW Management Area must have completed the appropriate training requirements specified in 29 CFR 1910.120(e). Each individual must have completed an annual 8-hour refresher training course and/or initial 40-hour training course within the last year prior to performing any work at the IDW Management Area. Also, on-site managers and supervisors directly responsible for supervising individuals engaged in hazardous waste operations must have completed the specified 8-hour supervisor training course.

Although not required under 29 CFR 1910.120, one person qualified in First Aid and CPR will be present during all site work.

IDW Management Area personnel will be required to provide documentation of participation in a medical monitoring program and successful completion of the required training. This information must be provided prior to their performing any work on-site.

### **8.3 Pre-Entry Briefing**

The operating contractor will meet with FTW personnel to discuss the operational methods that will be used and the safety precautions associated with the work to be performed. The operating

contractor will be responsible for documenting the meeting and submitting a signed copy of the training roster to FTW personnel. This roster will become part of the contract files.

Prior to the commencement of on-site implementation activities, a site safety meeting will be held to review the specific requirements of this SSHP. SSHP sign-off sheets will be collected at this meeting. Attendance of the pre-entry briefing is mandatory and will be documented by the operating contractor. An attendance sign-in form is presented in Attachment C.

The following information should be covered in the pre-entry briefing:

- ◆ General Overview of SSHP;
- ◆ Names of Personnel and Alternates Responsible for Health and Safety;
- ◆ Chemical and Physical Hazards Associated with Site Activities;
- ◆ Personal Protective Equipment Required for Site Activities;
- ◆ Use of Air Monitoring Equipment;
- ◆ Site Emergency Procedures;
- ◆ Training and Medical Surveillance Requirements;
- ◆ Signs and Symptoms of Overexposure;
- ◆ Review of MSDSs for Decontamination Solutions;
- ◆ Risk-Minimizing Work Practices; and
- ◆ Uses of Safety Equipment.

#### **8.4 On-going Safety Meetings**

Short safety refresher meetings will be conducted, as needed, throughout the duration of the project. Safety meetings must be convened after an accident has occurred, if the operating contractor stops work or if new data is presented that has not been properly addressed in this SSHP.

#### **8.5 Site Control**

Site security and control will be provided by conducting soil IDW tasks within the fenced yard around Building 3476. Other IDW management facilities and treatment areas will be secured as deemed appropriate by the facility operator.

## 9.0 EMERGENCY RESPONSE PLAN

OSHA defines **emergency response** as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence that results, or is likely to result, in an **uncontrolled release of a hazardous substance.**" The IDW Management Area personnel response actions will be limited to evacuation and medical/first aid as described within this section below. Accordingly, this section of the SSHP has been written to meet the requirements of 29 CFR 1910.38 (a).

Any spill of fuel, hazardous chemicals, regulated waste, or hazardous substances, *no matter how small*, requires *immediate notification of the facility operator's SSHO, who in turn will contact the Hazardous Materials/Regulated Waste Manager and Supervisor, the Fire Department, and DPW Environmental Resources* (the supervisor or person in charge immediately notifies the Fire Department). DPW Environmental Resources will determine if additional reports to federal, state, and local agencies are required. In the event of a spill, all spill control and reporting tasks will be conducted in accordance with USARAK PAM 200-1, Section 16.0 First Responder Spill Response.

The basic elements of an emergency evacuation plan include employee training, alarm systems, escape routes, escape procedures, critical operations or equipment, rescue and medical duty assignments, designation of responsible parties, emergency reporting procedures, and methods to account for all employees after evacuation.

**Employee Training:** Employees must be instructed in the specific aspects of emergency evacuation applicable to the site as part of the site safety meeting prior to the commencement of all on-site activities. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

**Alarm Systems/Emergency Signals:** An emergency communication system must be in effect at the IDW Management Area. The most simple and effective emergency communication system in many situations will be **direct verbal communication**. Verbal communication must be

supplemented anytime voices can not be clearly perceived above ambient noise levels (e.g., noise from heavy equipment) and anytime a clear-line-of-sight can not be easily maintained amongst all IDW Management Area personnel because of distance, terrain or other obstructions. Currently, if verbal communications cannot be clearly perceived all operations requiring verbal communication will be halted until conditions allow easily maintained communication.

Employees will be able to communicate effectively with one another in each of the work areas. If there is more than one work crew on-site at a time, additional communication will be required so that the two teams can interact with each other and support each other in the event of an emergency.

**Escape Routes and Procedures:** The operating contractor will meet with FTW DPW Environmental Resources representatives to identify the appropriate escape routes from the IDW Management Area. These escape routes will be discussed with the IDW Management Area personnel during the pre-entry briefing.

**Critical Operations or Equipment:** All equipment and operations are required to cease in accordance with the established signal procedure. The only exception will be related to health and safety. The operating contractor must determine at the time of an emergency if health and safety will be jeopardized by immediate stoppage of any particular piece of equipment or personal activities. If such a determination is made, personnel involved in critical duties must be minimized and special instructions must be established.

**Rescue and Medical Duty Assignments:** IDW Management Area personnel can contact emergency personnel by dialing the emergency dispatcher at extension 911. The dispatcher will contact security, fire, and ambulance services as well as the Explosive Ordnance Disposal team. Table 5 provides the numbers of FTW and contractor safety personnel. Directions to the hospital should be taped to the dashboard of all on-site vehicles that may be used for emergency transport.

The operating contractor is responsible for activating emergency response actions. In the event an injury or illness requires more than first aid treatment, that individual will accompany the

injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the on-site project manager and the operating contractor's corporate HSM.

If the injured employee can be moved from the accident area, he or she will be brought to a safe area where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The operating contractor must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

**Designation of Responsible Parties:** The operating contractor is responsible for initiating emergency response. In the event the operating contractor cannot fulfill this duty, an alternate will take charge. All personnel on-site are responsible for knowing the escape route from the site.

**Accident Investigation:** Any incident (other than minor first aid treatment) resulting in injury, illness, or property damage requires an accident investigation and report. The investigation will be initiated as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided.

The investigation should begin while details are fresh in the mind of anyone involved. The person administering first aid may be able to start the fact gathering process if the injured are able to speak. Pertinent facts must be determined. Questions beginning with who, what, when, where, and how are usually most effective to discover ways to improve job performance in terms of efficiency, quality of work, as well as health and safety concerns.

The USACE accident investigation form is presented in Attachment D.

In the event of an accident, the operating contractor is required to report to the operating contractor's corporate HSM and complete a North Wind Form-520, Incident Report Form. A copy of this form will be forwarded to the operating contractor's corporate HSM as soon as possible. If a subcontractor employee is injured, he/she must submit their company accident investigation forms to the operating contractor as soon as possible.

In addition, the operating contractor must immediately report any accident or incident to the FTW representative.

A list of emergency references is provided in Table 5.

**Table 5      Emergency References**

<b>Contact</b>	<b>Telephone Numbers</b>
FIRE:	911 (Fort Emergency Dispatcher)
POLICE:	911 (Fort Emergency Dispatcher)
AMBULANCE:	911 (Fort Emergency Dispatcher)
HOSPITAL:	911 (Fort Wainwright – Bassett Army Community Hospital)
DPW ENVIRONMENTAL RESOURCES	1-(907) 353-9195/6489
NATIONAL RESPONSE CENTER:	1-800-424-8802
<b>CONTRACTOR REPRESENTATIVES:</b>	
North Wind, Inc.	Kim Kearney Project Manager 1-(907)-277-5488 (0800-1700 Mon-Fri) 1-(907)-242-1877 (after business hours)
North Wind, Inc.	Mark Kitter Site Safety and Health Officer 1-(907)-277-5488 (0800-1700 Mon-Fri)
North Wind, Inc.	Bruce Miller, CIH Corporate Health and Safety Manager 1-(208) 520-4644 (anytime)

## 10.0 SPILL CONTINGENCY PLAN

Liquid IDW will be treated at the IDW Management Area. It is possible that a failure of a holding tank or leak in the system may occur. The entire treatment system secondary containment is capable of containing 150 percent of the volume of all holding tanks. Spilled fluids can then be pumped to empty vessels or drummed if necessary and re-introduced to the treatment system. DPW should be notified immediately in the event a spill occurs.

IDW soil is stored and moved to Building 3476 and the fenced yard around the building. Spills that occur in this area should follow response requirements detailed in USARAK Pamphlet 200-1 Section 16.

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**ATTACHMENT A  
SSHIP SIGN-OFF SHEET**



**Site-Specific Safety and Health Plan Receipt and Acceptance Form**

**For the**

**IDW Management Area, Fort Wainwright, Alaska**

I have reviewed this document and understand its contents and requirements. A copy of the above-referenced document has been made available to me. I agree to abide by the requirements of this Site-Specific Safety and Health Plan.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Representing



**ATTACHMENT B**  
**MATERIAL SAFETY DATA SHEETS**





**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**FUEL OIL, 008102**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

The information in this document is compiled from information maintained by the United States Department of Defense (DOD). Anyone using this information is solely responsible for the accuracy and applicability of this information to a particular use or situation. Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

**Section 1 - Product and Company Identification  
FUEL OIL, 008102**

**Product Identification:** FUEL OIL, 008102  
**Date of MSDS:** 06/04/1990 **Technical Review Date:** 05/16/1995  
**FSC:** 9140 **NIIN:** LIIN: 00N017173  
**Submitter:** N EN  
**Status Code:** C  
**MFN:** 01  
**Article:** N  
**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** B P AUSTRALIA LIMITED  
**Manufacturer's Address1:** 1 ALBERT RD  
**Manufacturer's Address2:** MELBORNE, NK 00000

**Manufacturer's Country:** US  
**General Information Telephone:** 03-268-4111  
**Emergency Telephone:** 03-268-4111  
**Emergency Telephone:** 03-268-4111  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** N  
**Published:** Y  
**CAGE:** 9V308  
**Special Project Code:** N

### Contractor Information

**Contractor's Name:** B P AUSTRALIA LIMITED  
**Contractor's Address1:** 1 ALBERT RD  
**Contractor's Address2:** MELBORNE, NK 00000  
**Contractor's Telephone:** 03-268-4111  
**Contractor's CAGE:** 9V308

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### Section 2 - Compositon/Information on Ingredients

#### FUEL OIL, 008102

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**Ingredient Name:** DIESEL FUELS;(PETROLEUM HYDROCARBON COMPOUNDS)  
**Ingredient CAS Number:** 68334-30-5 **Ingredient CAS Code:** M  
**RTECS Number:** HZ1800000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: >99**  
**% Enviromental Weight:**  
**Other REC Limits:** N/K  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code:** M  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code:** M  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:** N

**Ingredient Name:** EFTS OF OVEREXP:PNEUMIT. NOTE TO MD:1:FUEL INJECTION THROUGH SKIN FROM CONTACT W/HIGH PRESS/VELOCITY FUEL (SEE ING 5)  
**Ingredient CAS Number:** **Ingredient CAS Code:** X  
**RTECS Number:** 9999999ZZ **RTECS Code:** M  
**=WT: =WT Code:**

**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name:** FIRST AID PROC:TO THE NOSE, THROAT OR COUGHING, REMOVE TO FRESH AIR. GET MD IF SYMPS PERSIST. IF CASUALTY IS(SEE ING 13)

**Ingredient CAS Number: Ingredient CAS Code: X**  
**RTECS Number: 999999ZZ RTECS Code: M**  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name:** ING 10:ASPIRATION, GASTRIC LAVAGE SHOULD BE AVOIDED-IF DEEMED NECESSARY INDERTAKE ONLY AFTER ENDOTRACHEAL INTUBATION.

**Ingredient CAS Number: Ingredient CAS Code: X**  
**RTECS Number: 999999ZZ RTECS Code: M**  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**

**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name:** ING 11:UNCON BUT BRTHG, PLACE IN UNCON (RECOVERY) POSITION. IF NOT BRTHG, GIVE MOUTH-TO-MOUTH VENT & (SEE ING 14)

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: 9999999ZZ RTECS Code: M**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**

**% Low Volume: % Low Volume Code:**

**% High Volume: % High Volume Code:**

**% Text: N/K**

**% Enviromental Weight:**

**Other REC Limits: N/K**

**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**

**OSHA STEL: OSHA STEL Code:**

**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**

**ACGIH STEL: N/P ACGIH STEL Code:**

**EPA Reporting Quantity:**

**DOT Reporting Quantity:**

**Ozone Depleting Chemical:**

**Ingredient Name:** ING 13:EXTERNAL CARDIAC MASSAGE AS NECESSARY.

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: 9999999ZZ RTECS Code: M**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: UNKNOWN**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name: ING 4:SPRAYS ARE SERIOUS MED EMERGENCIES. INJURIES MAY NOT APPEAR SERIOUS AT FIRST BUT WITHIN A FEW HOURS (SEE ING 6)**

**Ingredient CAS Number: Ingredient CAS Code: X**  
**RTECS Number: 999999ZZ RTECS Code: M**

**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name: ING 5:TISSUE BECOMES SWOLLEN, DISCOLOURED & EXTREMELY PAINFUL W/EXTENSIVE SUBCULTANEOUS NECROSIS. EMERGENCY (SEE ING 7)**

**Ingredient CAS Number: Ingredient CAS Code: X**  
**RTECS Number: 999999ZZ RTECS Code: M**

**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**

<Volume: <Volume Code:  
% Low WT: % Low WT Code:  
% High WT: % High WT Code:  
% Low Volume: % Low Volume Code:  
% High Volume: % High Volume Code:  
% Text: N/K  
% Enviromental Weight:  
Other REC Limits: N/K  
OSHA PEL: NOT APPLICABLE OSHA PEL Code: M  
OSHA STEL: OSHA STEL Code:  
ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M  
ACGIH STEL: N/P ACGIH STEL Code:  
EPA Reporting Quantity:  
DOT Reporting Quantity:  
Ozone Depleting Chemical:

**Ingredient Name:** ING 6:SURGICAL EXPLORATION & THORO CLEANSING OF WOUND & UNDERLYING TISSUES IS NECESSARY TO MINIMIZE NECROSIS (SEE ING 8)

**Ingredient CAS Number: Ingredient CAS Code:** X

**RTECS Number: 999999ZZ RTECS Code:** M

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**

**% Low Volume: % Low Volume Code:**

**% High Volume: % High Volume Code:**

**% Text: N/K**

**% Enviromental Weight:**

**Other REC Limits: N/K**

**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**

**OSHA STEL: OSHA STEL Code:**

**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**

**ACGIH STEL: N/P ACGIH STEL Code:**

**EPA Reporting Quantity:**

**DOT Reporting Quantity:**

**Ozone Depleting Chemical:**

**Ingredient Name:** ING 7:AND TISSUE LOSS. NOTE:HIGH PRESS MAY FORCE FLUID CONSIDERABLY LONG DISTANCES ALONG TISSUE PLANES. 2: (SEE ING 9)

**Ingredient CAS Number: Ingredient CAS Code:** X

**RTECS Number: 999999ZZ RTECS Code:** M

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name: ING 8:OIL CAN BE ASPIRATED FOLLOWING REGURGITATION OF STOMACH CONTENTS & CAN CAUSE SEVERE/POTENTIALLY FATAL(SEE ING 10)**

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: 9999999ZZ RTECS Code: M**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**

**% Low Volume: % Low Volume Code:**

**% High Volume: % High Volume Code:**

**% Text: N/K**

**% Enviromental Weight:**

**Other REC Limits: N/K**

**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**

**OSHA STEL: OSHA STEL Code:**

**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**

**ACGIH STEL: N/P ACGIH STEL Code:**

**EPA Reporting Quantity:**

**DOT Reporting Quantity:**

**Ozone Depleting Chemical:**

**Ingredient Name: ING 9:CHEM PNEUMIT, WHICH MAY REQUIRE TREATMENT W/ANTIBIOTIC & CORTICOSTEROID THERAPY. BECAUSE OF RISK OF (SEE ING 11)**

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: 9999999ZZ RTECS Code: M**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Enviromental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name:** OTHER PREC:STANDING BY OUTSIDE THE TANK WITH NIOSH/MSHA APPROVED SCBA & APPROPRIATE EQUIP TO EFFECT A QUICK RESCUE.

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: 9999999ZZ RTECS Code: M**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**

**% Low Volume: % Low Volume Code:**

**% High Volume: % High Volume Code:**

**% Text: N/K**

**% Enviromental Weight:**

**Other REC Limits: N/K**

**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**

**OSHA STEL: OSHA STEL Code:**

**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**

**ACGIH STEL: N/P ACGIH STEL Code:**

**EPA Reporting Quantity:**

**DOT Reporting Quantity:**

**Ozone Depleting Chemical:**

**Ingredient Name:** POLYCYCLIC AROMATIC HYDROCARBONS

**Ingredient CAS Number: Ingredient CAS Code: X**

**RTECS Number: RTECS Code: X**

**=WT: =WT Code:**

**=Volume: =Volume Code:**

**>WT: >WT Code:**

**>Volume: >Volume Code:**

**<WT: <WT Code:**

**<Volume: <Volume Code:**

**% Low WT: % Low WT Code:**

**% High WT: % High WT Code:**

**% Low Volume: % Low Volume Code:**

**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Environmental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

**Ingredient Name: SUPP DATA:CAN CREATE A FLAMMABILITY OR EXPLOSION HAZARD.**  
**Ingredient CAS Number: Ingredient CAS Code: X**  
**RTECS Number: 999999ZZ RTECS Code: M**  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: N/K**  
**% Environmental Weight:**  
**Other REC Limits: N/K**  
**OSHA PEL: NOT APPLICABLE OSHA PEL Code: M**  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV: NOT APPLICABLE ACGIH TLV Code: M**  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:**

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**FUEL OIL, 008102**

---

**Health Hazards Acute & Chronic:** INGEST:UNLIKELY TO CAUSE HARM IF ACCIDENTALLY SWALLOWED ALTHOUGH INGESTION OF LARGE AMOUNTS MAY CAUSE GI EFTS SUCH AS DISCOMFORT, VOMIT AND DIARRHEA. EYE:MAY BE IRRIT TO EYES IF EXPOSED TO VAPS, MISTS OR FUMES. SKIN:ON RPTD/PRLNGD CONTACT MAY CAUSE DERM AND SERIOUS IRREVERSIBLE SKIN DISORDERS. (EFTS OF OVEREXP)

**Signs & Symptoms of Overexposure:**

HLTH HAZ:UNLIKELY TO CAUSE SKIN SENSIT. CRACKED COMPONENTS CONTAINING POLYCYCLIC AROMATIC HYDROCARBON COMPOUNDS MAY BE PRESENT, SOME OF WHICH HAVE BEEN SHOWN TO INDUCE SKIN CANCER IN LAB ANIMALS. INHA L:VAPORS/MIST MAY CAUSE IRRIT TO NOSE &THROAT. ASPIRATION OF LIQ INTO

LUNGS CAN CAUSE SERIOUS (EVEN FATAL) (SEE ING 4)

**Medical Conditions Aggravated by Exposure:**  
NONE SPECIFIED BY MANUFACTURER.

**LD50 LC50 Mixture:** NONE SPECIFIED BY MANUFACTURER.

**Route of Entry Indicators:**

**Inhalation:** YES  
**Skin:** NO  
**Ingestion:** YES

**Carcinogenicity Indicators**

**NTP:** NO  
**IARC:** NO  
**OSHA:** NO

**Carcinogenicity Explanation:** NOT RELEVANT.

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**Section 4 - First Aid Measures**  
**FUEL OIL, 008102**

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**First Aid:**

INGEST: CONTACT MD OR POIS CTL CTR. DO NOT INDUCE VOMIT. GIVE A GLASS OF WATER. IF ANY SUSPICION OF ASPIRATION INTO LUNGS (E.G. DURING VOMITING) OBTAIN MD IMMEDIATELY. EYE: IRRIGATE WITH COPIOUS QUANTITIES OF WATER. IF SORENESS OR REDNESS PERSISTS, GET MD. SKIN: WASH OFF WITH SOAP AND WATER. REMOVE CONTAM CLTHG & LAUNDRER BEFORE RE-USE. INHAL: IF INHAL OF MISTS, FUMES OR VAPS CAUSES IRRIT (SEE ING 12)

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**Section 5 - Fire Fighting Measures**  
**FUEL OIL, 008102**

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**Fire Fighting Procedures:**

WEAR NIOSH/MSHA APPROVED SCBA & FULL PROT EQUIP (FP N). USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES & ANY ADJACENT STORAGE VESSELS. IF SAFE, SHUT OFF (SUPDAT)

**Unusual Fire or Explosion Hazard:**

COMBUSTIBLE. AVOID HEAT/SOURCES OF IGNIT. HOSES SHOULD BE ELEC CONTINUOUS & CONTAINERS BONDED TO AVOID STATIC CHARGE BUILD-UP. WILL PRESENT FLAMM HAZ (SUPP DATA)

**Extinguishing Media:**

USE FOAM, CO\*2, POWDER OR BCF FIRE EXTINGUISHERS.

**Flash Point:** Flash Point Text: >142F, 61C

**Autoignition Temperature:**

**Autoignition Temperature Text:** N/A  
**Lower Limit(s):** 0.7%  
**Upper Limit(s):** 5%

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**Section 6 - Accidental Release Measures**  
**FUEL OIL, 008102**

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**Spill Release Procedures:**

KEEP PUBLIC AWAY. EXTINGUISH ALL IGNITION SOURCES. FOR MAJOR SPILLS, DAM & RECOVER. PREVENT ENTRY INTO DRAINAGE SYSTEMS, RIVERS, ETC. COLLECT W/ABSORBENT MATL SUCH AS SAND EARTH OR SAWDUST. WARN OCCUPANTS DOWNWIND.

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**Section 7 - Handling and Storage**  
**FUEL OIL, 008102**

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**Handling and Storage Precautions:****Other Precautions:**

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**Section 8 - Exposure Controls & Personal Protection**  
**FUEL OIL, 008102**

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**Respiratory Protection:**

DO NOT ENTER STORAGE TANKS WITHOUT NIOSH/MSHA APPROVED SCBA UNLESS TANK HAS BEEN WELL VENTILATED & TANK ATMOSPHERE HAS BEEN SHOWN TO CONTAIN HYDROCARBON VAPOR CONC OF LESS THAN 1% OF THE LOWER FLAMM LIMIT & O<sub>2</sub> CONC OF AT LEAST 20% VOLUME.

**Ventilation:**

NONE SPECIFIED BY MANUFACTURER.

**Protective Gloves:**

PVC GLOVES.

**Eye Protection:** CHEMICAL WORKERS GOGGLES (FP N).

**Other Protective Equipment:** PROTECTIVE CLOTHING AS NECESSARY TO PREVENT SKIN CONTACT.

**Work Hygienic Practices:** AVOID CONTACT WITH SKIN AND OBSERVE GOOD PERSONAL HYGIENE.

**Supplemental Health & Safety Information:** FIRE FIGHT PROC:SOURCE OF PROD. REMOVE SOURCES OF RE-IGNITION. EXPLO HAZ:HEATED ABOVE FLASH POINT, (NOTE:FLASH POINT MUST NOT BE REGARDED AS RELIABLE INDICATOR OF POTNTL FLAMM OF VAP IN FUEL TANK HEAD SPACES). IF FUEL CONTACTS HOT SURFS OR LEAKS FROM HIGH PRESS FUEL PIPES, VAPS/MISTS CAN BE GENERATED WHICH (SEE ING 3)

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**Section 9 - Physical & Chemical Properties**  
**FUEL OIL, 008102**

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**HCC:** V4

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point: Boiling Point Text:** 356F,180C

**Melting/Freezing Point: Melting/Freezing Text:** N/K

**Decomposition Point: Decomposition Text:** N/K

**Vapor Pressure:** >0.1 KPA **Vapor Density:** N/K

**Percent Volatile Organic Content:**

**Specific Gravity:** N/K

**Volatile Organic Content Pounds per Gallon:**

pH: N/K

**Volatile Organic Content Grams per Liter:**

Viscosity: N/P

**Evaporation Weight and Reference: N/K**

Solubility in Water: &lt;0.1% MASS @20C

Appearance and Odor: PALE YELLOW/ORANGE LIQUID

Percent Volatiles by Volume: &gt;90%

Corrosion Rate: N/K

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**Section 10 - Stability & Reactivity Data**  
**FUEL OIL, 008102**

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**Stability Indicator:** N/P**Materials to Avoid:**

NONE SPECIFIED BY MANUFACTURER.

**Stability Condition to Avoid:**

NONE SPECIFIED BY MANUFACTURER.

**Hazardous Decomposition Products:**

OXIDES OF CARBON, NITROGEN AND SULPHUR.

**Hazardous Polymerization Indicator:** N/P**Conditions to Avoid Polymerization:**

NONE SPECIFIED BY MANUFACTURER.

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**Section 11 - Toxicological Information**  
**FUEL OIL, 008102**

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**Toxicological Information:**

N/P

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**Section 12 - Ecological Information**  
**FUEL OIL, 008102**

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**Ecological Information:**

N/P

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**Section 13 - Disposal Considerations**  
**FUEL OIL, 008102**

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**Waste Disposal Methods:**

ADVISE AUTHORITIES. ENSURE WASTE DISP CONFORMS W/LOCAL WASTE DISP REGULATIONS. AFTER RECOVERY AND EVAPORATION REMAINING SOIL MAY BE DISPOSED OF TO APPROVED LANDFILL, OR IF APPROVED, ALLOWED TO DEGRADE INSITU. MODERATELY TOXIC TO AQUATIC LIFE.

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**Section 14 - MSDS Transport Information**  
**FUEL OIL, 008102**

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**Transport Information:**

N/P

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**Section 15 - Regulatory Information**

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**FUEL OIL, 008102**

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**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**N/P

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**Section 16 - Other Information****FUEL OIL, 008102**

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**Other Information:**

N/P

**HMIS Transportation Information****Product Identification:** FUEL OIL, 008102**Transportation ID Number:** 21795**Responsible Party CAGE:** 9V308**Date MSDS Prepared:** 06/04/1990**Date MSDS Reviewed:** 11/04/1991**MFN:** 11/04/1991**Submitter:** N TN**Status Code:** C**Container Information****Unit of Issue:** NK**Container Quantity:** NK**Type of Container:****Net Unit Weight:****Article without MSDS:** N**Technical Entry NOS Shipping Number:****Radioactivity:****Form:****Net Explosive Weight:****Coast Guard Ammunition Code:****Magnetism:** N/P**AF MMAC Code:****DOD Exemption Number:****Limited Quantity Indicator:****Multiple Kit Number:** 0**Kit Indicator:** N**Kit Part Indicator:** N**Review Indicator:** Y**Additional Data:**

NOT REGULATED FOR TRANSPORTATION

**Department of Transportation Information****DOT Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION**DOT PSN Code:** ZZZ**Symbols:** N/R

**DOT PSN Modifier:**  
**Hazard Class:** N/R  
**UN ID Number:** N/R  
**DOT Packaging Group:** N/R  
**Label:** N/R  
**Special Provision(s):** N/R  
**Packaging Exception:** N/R  
**Non Bulk Packaging:** N/R  
**Bulk Packaging:** N/R  
**Maximum Quantity in Passenger Area:** N/R  
**Maximum Quantity in Cargo Area:** N/R  
**Stow in Vessel Requirements:** N/R  
**Requirements Water/Sp/Other:** N/R

#### **IMO Detail Information**

**IMO Proper Shipping Name:** NOT REGULATED FOR THIS MODE OF TRANSPORTATION  
**IMO PSN Code:** ZZZ  
**IMO PSN Modifier:**  
**IMDG Page Number:** N/R  
**UN Number:** N/R  
**UN Hazard Class:** N/R  
**IMO Packaging Group:** N/R  
**Subsidiary Risk Label:** N/R  
**EMS Number:** N/R  
**Medical First Aid Guide Number:** N/R

#### **IATA Detail Information**

**IATA Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION  
**IATA PSN Code:** ZZZ  
**IATA PSN Modifier:**  
**IATA UN Id Number:** N/R  
**IATA UN Class:** N/R  
**Subsidiary Risk Class:** N/R  
**UN Packaging Group:** N/R  
**IATA Label:** N/R  
**Packaging Note for Passengers:** N/R  
**Maximum Quantity for Passengers:** N/R  
**Packaging Note for Cargo:** N/R  
**Maximum Quantity for Cargo:** N/R  
**Exceptions:** N/R

#### **AFI Detail Information**

**AFI Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION  
**AFI Symbols:**  
**AFI PSN Code:** ZZZ  
**AFI PSN Modifier:**  
**AFI UN Id Number:** N/R  
**AFI Hazard Class:** N/R  
**AFI Packing Group:** N/R  
**AFI Label:** N/R  
**Special Provisions:** N/A  
**Back Pack Reference:** N/A

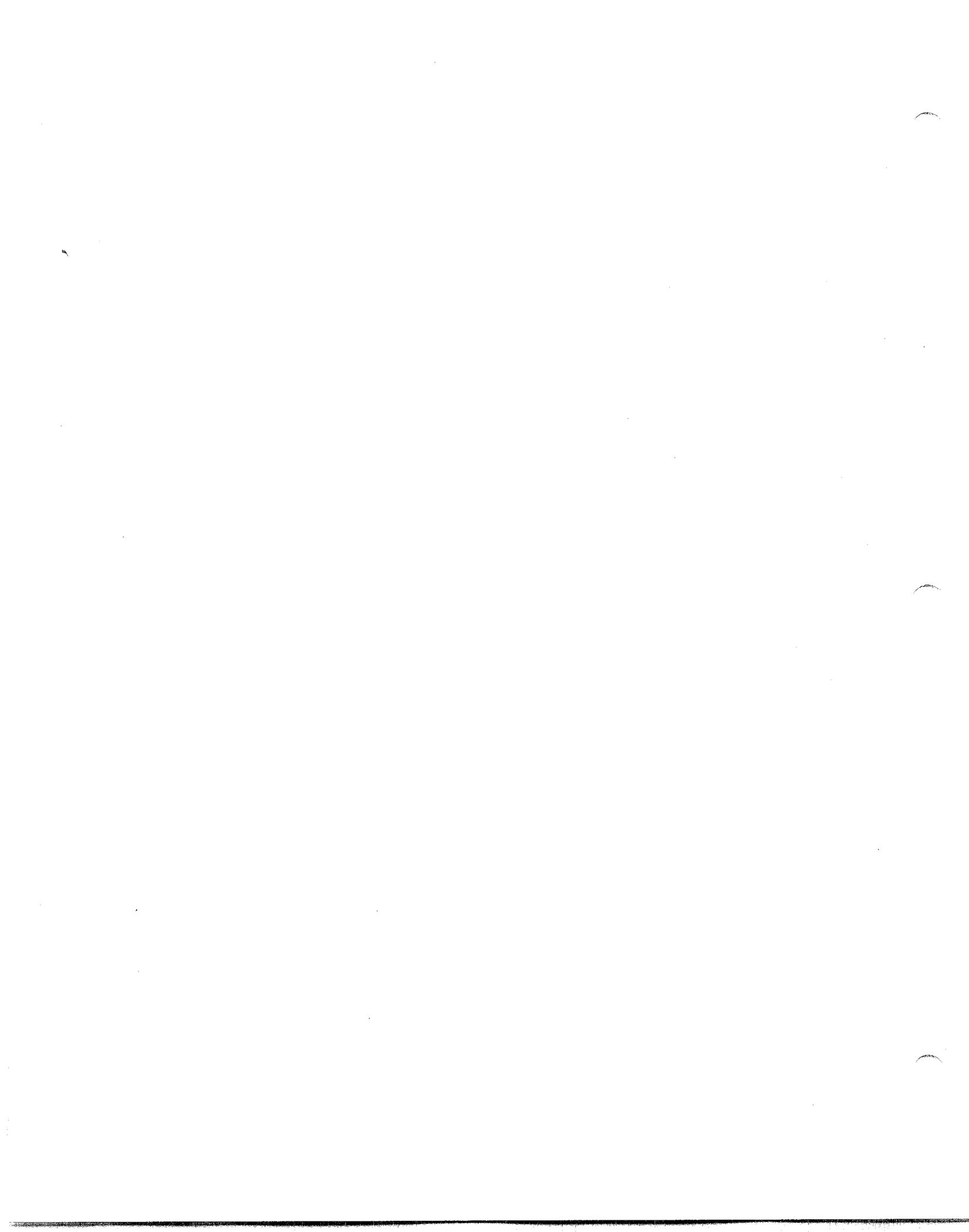
#### **HAZCOM Label Information**

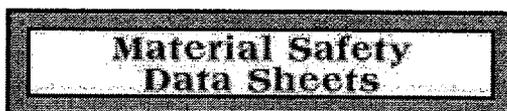
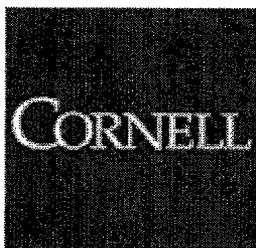
**Product Identification:** FUEL OIL, 008102

**CAGE:** 9V308  
**Assigned Individual:** N  
**Company Name:** B P AUSTRALIA LIMITED  
**Company PO Box:**  
**Company Street Address1:** 1 ALBERT RD  
**Company Street Address2:** MELBORNE, NK 00000 US  
**Health Emergency Telephone:** 03-268-4111  
**Label Required Indicator:** Y  
**Date Label Reviewed:** 08/06/1991  
**Status Code:** C  
**Manufacturer's Label Number:**  
**Date of Label:** 08/06/1991  
**Year Procured:** N/K  
**Organization Code:** G  
**Chronic Hazard Indicator:** N  
**Eye Protection Indicator:** YES  
**Skin Protection Indicator:** YES  
**Respiratory Protection Indicator:** YES  
**Signal Word:** WARNING  
**Health Hazard:** Moderate  
**Contact Hazard:** Slight  
**Fire Hazard:** Moderate  
**Reactivity Hazard:** None

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**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**KEROSENE**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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**Section 1 - Product and Company Identification**  
**KEROSENE**

**Product Identification:** KEROSENE

**Date of MSDS:** 11/20/1985 **Technical Review Date:** 02/22/1995

**FSC:** 9140 **NIIN:** LIIN: 00F038305

**Submitter:** F BT

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** BEACON OIL CO  
**Post Office Box:** 466  
**Manufacturer's Address1:** 525 W THIRD ST  
**Manufacturer's Address2:** HANFORD, CA 93230-5016  
**Manufacturer's Country:** US  
**General Information Telephone:** 209-582-0241  
**Emergency Telephone:** 209-582-0241  
**Emergency Telephone:** 209-582-0241  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 4E189  
**Special Project Code:** N

**Preparer Information**

**Preparer's Name:** BEACON OIL CO  
**Preparer's Address1:** 525 W THIRD ST  
**Preparer's Address2:** HANFORD, CA 93230-5016  
**Preparer's CAGE:** 4E189  
**Assigned Individual:** N

**Contractor Information**

**Contractor's Name:** BEACON OIL CO  
**Contractor's Address1:** 525 W THIRD ST  
**Contractor's Address2:** HANFORD, CA 93230-5016  
**Contractor's Telephone:** 209-583-3304  
**Contractor's CAGE:** 4E189

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**Section 2 - Compositon/Information on Ingredients**  
**KEROSENE**

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**Ingredient Name:** KEROSENE, KEROSINE (SUSPECTED ANIMAL CARC BY IARC) \*95-1\*  
**Ingredient CAS Number:** 8008-20-6 **Ingredient CAS Code:** M  
**RTECS Number:** OA5500000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** 99.8  
**% Enviromental Weight:**

**Other REC Limits:** 100 MG/CUM NIOSH  
**OSHA PEL:** N/K OSHA PEL Code: M  
**OSHA STEL:** OSHA STEL Code:  
**ACGIH TLV:** N/K ACGIH TLV Code: M  
**ACGIH STEL:** N/P ACGIH STEL Code:  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**KEROSENE**

---

**Health Hazards Acute & Chronic:** INHALATION: IRRITATION TO THE NOSE, THROAT & LUNGS, CNS DEPRESSION & DEATH. SKIN/EYES: IRRITATION. INGESTION: IRRITATION OF MOUTH, THROAT & GI TRACT, CNS DEPRESSION.

**Signs & Symptoms of Overexposure:**  
IRRITATION, DIZZINESS, DROWSINESS, LOSS OF COORDINATION, COMA, REDNESS, BURNING, TEARING, NAUSEA, VOMITING, DIARRHEA, RESTLESSNESS

**Medical Conditions Aggravated by Exposure:**  
N/K

**LD50 LC50 Mixture:** N/P

**Route of Entry Indicators:**  
**Inhalation:** YES  
**Skin:** NO  
**Ingestion:** YES

**Carcinogenicity Indicators**  
**NTP:** NO  
**IARC:** NO  
**OSHA:** NO

**Carcinogenicity Explanation:** NONE

---

**Section 4 - First Aid Measures**  
**KEROSENE**

---

**First Aid:**  
INHALATION: MOVE TO FRESH AIR. GIVE AIR, OXYGEN/CPR IF NECESSARY. EYES: FLUSH W/CLEAN WATER FOR 15 MINS. SKIN: WIPE FREE OF EXCESS LIQUIDS W/CLOTH. WASH W/SOAP & WATER. INGESTION: ASPIRATION HAZARD. DO NOT INDUCE VOMITING. ASPIRATION HAZARD. OBTAIN MEDICAL ATTENTION IN ALL CASES.

---

**Section 5 - Fire Fighting Measures**  
**KEROSENE**

---

**Fire Fighting Procedures:**

USE WATER FOG/SPRAY IN COOLING TANKS & CONTAINERS. DON'T ENTER ENCLOSED/CONFINED FIRE SPACE W/OUT PROPER PROTECTIVE EQUIPMENT. USE SCBA DOWNWIND OF FIRE.

**Unusual Fire or Explosion Hazard:**

COMBUSTIBLE LIQUID. MATERIAL MAY BE IGNITED BY HEAT, SPARKS, OPEN FLAME. KEROSENE FLOATS ON WATER & MAY CREATE AN EXPLOSION/FIRE/ENVIRONMENTAL HAZARD.

**Extinguishing Media:**

FOAM, DRY CHEMICAL, CO2, HALON

**Flash Point:** Flash Point Text: 110-162F

**Autoignition Temperature:**

**Autoignition Temperature Text:** N/A

**Lower Limit(s):** 0.7

**Upper Limit(s):** 5

---

**Section 6 - Accidental Release Measures**  
**KEROSENE**

---

**Spill Release Procedures:**

CONTAIN/REMOVE IGNITION SOURCES/SAFELY STOP FLOW. SMALL: REMOVE W/ABSORBENT MATERIAL/TRANSFER TO SAFE CONTAINER/STORE IN WELL VENTILATED FIRE SAFE STORAGE AREA UNTIL DISPOSAL. LARGE: EVACUATE PERSONNEL. USE PROPER PROTECTION EQUIPMENT. (SEE SUPP)

---

**Section 7 - Handling and Storage**  
**KEROSENE**

---

**Handling and Storage Precautions:**

**Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**KEROSENE**

---

**Respiratory Protection:**

USE NIOSH/MSHA APPROVED RESPIRATOR WHEN VAPOR LEVELS EXCEED EXPOSURE LIMITS.

**Ventilation:**

REQUIRED TO KEEP VAPOR CONCENTRATIONS BELOW OCCUPATIONAL EXPOSURE LIMITS.

**Protective Gloves:**

IMPERVIOUS

**Eye Protection:** REQUIRED WHEN SPLASHING/SPRAYING LIQUID.

**Other Protective Equipment:** IMPERVIOUS PROTECTIVE CLOTHING, APRON, BOOTS, FACIAL PROTECTION

**Work Hygienic Practices:** REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. REMOVE/DISCARD CONTAMINATED LEATHER SHOES/GLOVES. WASH AFTER HANDLING

**Supplemental Health & Safety Information:** SPILL PROC CONT'D: BLANKET W/FOAM/USE WATER FOG TO DISPERSE VAPORS. DIKE AREA TO PREVENT SPREADING. PUMP CONTAMINATED WATER & HYDROCARBON LIQUID TO SALVAGE TANK. REMAINING MATERIAL CAN BE TAKEN UP W/A BSORBENT & PLACED IN CONTAINERS.

---

**Section 9 - Physical & Chemical Properties**  
**KEROSENE**

---

**HCC:**

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point: Boiling Point Text:** 350-513F

**Melting/Freezing Point: Melting/Freezing Text:** N/K

**Decomposition Point: Decomposition Text:** N/K

**Vapor Pressure: 0 Vapor Density:** N/K

**Percent Volatile Organic Content:**

**Specific Gravity:** 0.81-0.83

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/K

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** N/K

**Solubility in Water:** NEGLIGIBLE

**Appearance and Odor:** LIGHT YELLOW W/KEROSENE ODOR.

**Percent Volatiles by Volume:** N/K

**Corrosion Rate:** N/K

---

**Section 10 - Stability & Reactivity Data**  
**KEROSENE**

---

**Stability Indicator:** YES

**Materials to Avoid:**

STRONG OXIDIZING AGENTS, STRONG ACIDS

**Stability Condition to Avoid:**

HEAT, SPARKS, OPEN FLAME & IGNITION SOURCES

**Hazardous Decomposition Products:**

CO, CO<sub>2</sub>, VARIOUS HYDROCARBON & SULFUR COMPOUNDS

**Hazardous Polymerization Indicator:** NO

**Conditions to Avoid Polymerization:**

N/K

---

**Section 11 - Toxicological Information**  
**KEROSENE**

---

**Toxicological Information:**

N/P

---

**Section 12 - Ecological Information**  
**KEROSENE**

---

**Ecological Information:**

N/P

---

**Section 13 - Disposal Considerations**  
**KEROSENE**

---

**Waste Disposal Methods:**

MAXIMIZE PRODUCT RECOVERY FOR REUSE/DISPOSE OF PRODUCT & CONTAMINATED MATERIALS IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS. IGNITABLE HAZARDOUS WASTE # (D001). COMBSUTIBLE LIQUID UN 1223.

---

**Section 14 - MSDS Transport Information**  
**KEROSENE**

---

**Transport Information:**

N/P

---

**Section 15 - Regulatory Information**  
**KEROSENE**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information**  
**KEROSENE**

---

**Other Information:**

N/P

**HAZCOM Label Information**

**Product Identification:** KEROSENE**CAGE:** 4E189**Assigned Individual:** N**Company Name:** BEACON OIL CO**Company PO Box:****Company Street Address1:** 525 W THIRD ST**Company Street Address2:** HANFORD, CA 93230-5016 US**Health Emergency Telephone:** 209-582-0241**Label Required Indicator:** Y**Date Label Reviewed:** 12/16/1998**Status Code:** C**Manufacturer's Label Number:****Date of Label:** 12/16/1998**Year Procured:** N/K**Organization Code:** G**Chronic Hazard Indicator:** N/P**Eye Protection Indicator:** N/P**Skin Protection Indicator:** N/P**Respiratory Protection Indicator:** N/P**Signal Word:** N/P**Health Hazard:**

**Contact Hazard:**

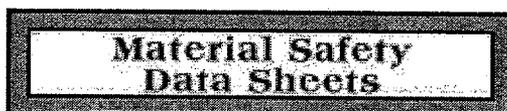
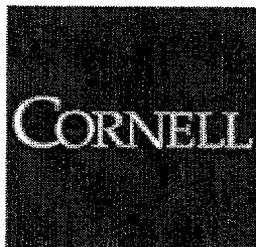
**Fire Hazard:**

**Reactivity Hazard:**

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**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**TOLUENE**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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**Section 1 - Product and Company Identification**  
**TOLUENE**

**Product Identification:** TOLUENE

**Date of MSDS:** 01/01/1985 **Technical Review Date:** 12/02/1998

**FSC:** 8030 **NIIN:** 00-432-1544

**Submitter:** F BT

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** ESSEX CHEMICAL CORP PRO-SEAL DIV  
**Manufacturer's Address1:** 19451 SUSANA RD  
**Manufacturer's Address2:** COMPTON, CA 90221-5713  
**Manufacturer's Country:** US  
**General Information Telephone:** 310-537-7600  
**Emergency Telephone:** 310-537-7600  
**Emergency Telephone:** 310-537-7600  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 83527  
**Special Project Code:** N

**Item Description**

**Item Name:** SEALING COMPOUND  
**Item Manager:** GSA  
**Specification Number:** MIL-S-8802  
**Type/Grade/Class:** TYPE 2; CLASS C-80  
**Unit of Issue:** KT  
**Unit of Issue Quantity:** 0  
**Type of Container:** METAL

**Contractor Information**

**Contractor's Name:** ESSEX CHEMICAL CORP PRO-SEAL DIV  
**Contractor's Address1:** 19451 SUSANA RD  
**Contractor's Address2:** COMPTON, CA 90221-5713  
**Contractor's Telephone:** 310-537-7600  
**Contractor's CAGE:** 83527

---

**Section 2 - Compositon/Information on Ingredients**  
**TOLUENE**

---

**Ingredient Name:** TOLUENE (SARA III)  
**Ingredient CAS Number:** 108-88-3 **Ingredient CAS Code:** M  
**RTECS Number:** XS5250000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** N/P

**% Environmental Weight:**  
**Other REC Limits:** N/P  
**OSHA PEL:** 200 PPM/150 STEL **OSHA PEL Code:** M  
**OSHA STEL:** **OSHA STEL Code:**  
**ACGIH TLV:** 50 PPM; 9293 **ACGIH TLV Code:** M  
**ACGIH STEL:** N/P **ACGIH STEL Code:**  
**EPA Reporting Quantity:** 1000 LBS  
**DOT Reporting Quantity:** 1000 LBS  
**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**TOLUENE**

---

**Health Hazards Acute & Chronic:** N/P

**Signs & Symptoms of Overexposure:**  
N/P

**Medical Conditions Aggravated by Exposure:**  
N/P

**LD50 LC50 Mixture:** N/P

**Route of Entry Indicators:**  
**Inhalation:** N/P  
**Skin:** N/P  
**Ingestion:** N/P

**Carcinogenicity Indicators**  
**NTP:** N/P  
**IARC:** N/P  
**OSHA:** N/P

**Carcinogenicity Explanation:** N/P

---

**Section 4 - First Aid Measures**  
**TOLUENE**

---

**First Aid:**  
N/P

---

**Section 5 - Fire Fighting Measures**  
**TOLUENE**

---

**Fire Fighting Procedures:**  
WATER NOT RECOMMENDED  
**Unusual Fire or Explosion Hazard:**  
VOLATILE SOLVENT  
**Extinguishing Media:**  
CO<sub>2</sub>, FOAM, DRY CHEMICAL

**Flash Point:** Flash Point Text: 66 F CLOSED CUP

**Autoignition Temperature:**

Autoignition Temperature Text: N/A

Lower Limit(s): 1.3

Upper Limit(s): 7

---

**Section 6 - Accidental Release Measures**  
**TOLUENE**

**Spill Release Procedures:**

N/P

---

**Section 7 - Handling and Storage**  
**TOLUENE**

**Handling and Storage Precautions:**

**Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**TOLUENE**

**Respiratory Protection:**

N/P

**Ventilation:**

N/P

**Protective Gloves:**

N/P

**Eye Protection:** N/P

**Other Protective Equipment:** N/P

**Work Hygienic Practices:** N/P

**Supplemental Health & Safety Information:** ESSEX CHEMICAL CORP., SPECIALTY  
CHEMICAL DIV. 19451 SUSANA ROAD, COMPTON, CA 90221

---

**Section 9 - Physical & Chemical Properties**  
**TOLUENE**

**HCC:** F2

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point:** Boiling Point Text: 110.7 C

**Melting/Freezing Point:** Melting/Freezing Text: N/A

**Decomposition Point:** Decomposition Text: N/A

**Vapor Pressure:** 36. Vapor Density: 3.1

**Percent Volatile Organic Content:**

**Specific Gravity:** 0.86

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/P

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** 4.5

**Solubility in Water:** NIL

**Appearance and Odor:** WHITE PASTE, ORGANIC SULFIDE ODOR

**Percent Volatiles by Volume:** 14

**Corrosion Rate:** N/P

---

**Section 10 - Stability & Reactivity Data  
TOLUENE**

---

**Stability Indicator:** N/P

**Materials to Avoid:**

N/P

**Stability Condition to Avoid:**

N/P

**Hazardous Decomposition Products:**

N/P

**Hazardous Polymerization Indicator:** N/P

**Conditions to Avoid Polymerization:**

N/P

---

**Section 11 - Toxicological Information  
TOLUENE**

---

**Toxicological Information:**

N/P

---

**Section 12 - Ecological Information  
TOLUENE**

---

**Ecological Information:**

N/P

---

**Section 13 - Disposal Considerations  
TOLUENE**

---

**Waste Disposal Methods:**

N/P

---

**Section 14 - MSDS Transport Information  
TOLUENE**

---

**Transport Information:**

N/P

---

**Section 15 - Regulatory Information  
TOLUENE**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information**  
**TOLUENE**

---

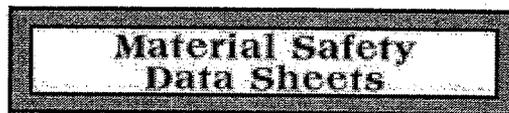
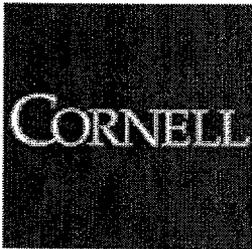
**Other Information:**

N/P

**HAZCOM Label Information****Product Identification:** TOLUENE**CAGE:** 83527**Assigned Individual:** N**Company Name:** ESSEX CHEMICAL CORP PRO-SEAL DIV**Company PO Box:****Company Street Address1:** 19451 SUSANA RD**Company Street Address2:** COMPTON, CA 90221-5713 US**Health Emergency Telephone:** 213-537-7600**Label Required Indicator:** Y**Date Label Reviewed:** 12/16/1998**Status Code:** C**Manufacturer's Label Number:****Date of Label:** 12/16/1998**Year Procured:** N/K**Organization Code:** G**Chronic Hazard Indicator:** N/P**Eye Protection Indicator:** N/P**Skin Protection Indicator:** N/P**Respiratory Protection Indicator:** N/P**Signal Word:** N/P**Health Hazard:****Contact Hazard:****Fire Hazard:****Reactivity Hazard:**

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**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**UNLEADED REGULAR GASOLINE**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
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**Section 1 - Product and Company Identification  
UNLEADED REGULAR GASOLINE**

**Product Identification:** UNLEADED REGULAR GASOLINE  
**Date of MSDS:** 03/07/1988 **Technical Review Date:** 04/25/1988  
**FSC:** 9130 **NIIN:** LIIN: 00B010045  
**Submitter:** B DT  
**Status Code:** C  
**MFN:** 01  
**Article:** N  
**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** AMOCO OIL COMPANY  
**Post Office Box:** N/K  
**Manufacturer's Address1:** 200 EAST RANDOLPH DRIVE  
**Manufacturer's Address2:** CHICAGO, IL 60601  
**Manufacturer's Country:** US  
**General Information Telephone:** 312 856-3907  
**Emergency Telephone:** 800 447-8735  
**Emergency Telephone:** 800 447-8735  
**MSDS Preparer's Name:** N/K  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 15958  
**Special Project Code:** N

**Contractor Information**

**Contractor's Name:** AMOCO OIL CO  
**Contractor's Address1:** 200 E RANDOLPH DR MC 1408  
**Contractor's Address2:** CHICAGO, IL 60601-6401  
**Contractor's Telephone:** 312-856-3907  
**Contractor's CAGE:** 15958

---

**Section 2 - Compositon/Information on Ingredients**  
**UNLEADED REGULAR GASOLINE**

---

**Ingredient Name:** GASOLINE  
**Ingredient CAS Number:** 8006-61-9 **Ingredient CAS Code:** M  
**RTECS Number:** LX3300000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** N/K  
**% Enviromental Weight:**  
**Other REC Limits:** N/K  
**OSHA PEL:** 300 PPM/500 STEL **OSHA PEL Code:** M  
**OSHA STEL:** **OSHA STEL Code:**  
**ACGIH TLV:** 300 PPM/500STEL;9192 **ACGIH TLV Code:** M  
**ACGIH STEL:** N/P **ACGIH STEL Code:**  
**EPA Reporting Quantity:**  
**DOT Reporting Quantity:**  
**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**UNLEADED REGULAR GASOLINE**

---

**Health Hazards Acute & Chronic:** INHALATION:MODERATELY TOXIC FOR ACUTE EXPOSURES BY THIS ROUTE.EYE:NO SIGNIFICANT IRRITATION EXPECTED.INGESTION:HARMFUL IF SWALLOWED AND/OR ASPIRATED INTO LUNGS.

**Signs & Symptoms of Overexposure:**

INHALATION:EXCESSIVE EXPOSURES TO VAPORS WILL PRODUCE SYMPTOMS OF INTOXICATION,HEADACHE,DIZZINESS,AND NAUSEA.SKIN:PROLONGED OR REPEATED CONTACT CAN DEFAT THE SKIN AND LEAD TO IRRITATION AND/OR DERMATI TIS.

**Medical Conditions Aggravated by Exposure:**

N/K

**LD50 LC50 Mixture:** N/K

**Route of Entry Indicators:**

**Inhalation:** YES

**Skin:** YES

**Ingestion:** YES

**Carcenogenicity Indicators**

**NTP:** N/P

**IARC:** N/P

**OSHA:** N/P

**Carcinogenicity Explanation:** N/K

---

**Section 4 - First Aid Measures**  
**UNLEADED REGULAR GASOLINE**

---

**First Aid:**

IN CASE OF EYE CONTACT,FLUSH WITH PLENTY OF WATER.SKIN CONTACT,WASH EXPOSED SKIN WITH SOAP AND WATER.REMOVE CONTAMINATED CLOTHING,INCLUDING SHOES AND THOROUGHLY CLEAN AND DRY BEFORE REUSE.INHALATION:IF HARMFUL EFFECTS OCCUR,REMOVE TO UNCONTAMINATED AREA.GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING.INGESTION:IF SWALLOWED,DO NOT INDUCE VOMITING.GET MEDICAL ATTENTION.

---

**Section 5 - Fire Fighting Measures**  
**UNLEADED REGULAR GASOLINE**

---

**Fire Fighting Procedures:**

N/K

**Unusual Fire or Explosion Hazard:**

EXTREMELY FLAMMABLE VAPOR/AIR MIXTURES FORM.

**Extinguishing Media:**

DRY CHEMICAL B-C,CARBON DIOXIDE,WATER FOG,FOAM(WATER MAY BE

INEFFECTIVE).

**Flash Point:** Flash Point Text: -45 F

**Autoignition Temperature:**

**Autoignition Temperature Text:** N/A

**Lower Limit(s):** 1.3%

**Upper Limit(s):** 7.6%

---

**Section 6 - Accidental Release Measures**  
**UNLEADED REGULAR GASOLINE**

---

**Spill Release Procedures:**

REMOVE OR SHUT OFF ALL SOURCES OF IGNITION. USE WATER SPRAY TO DISPERSE VAPORS. INCREASE VENTILATION IF POSSIBLE.

---

**Section 7 - Handling and Storage**  
**UNLEADED REGULAR GASOLINE**

---

**Handling and Storage Precautions:**

**Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**UNLEADED REGULAR GASOLINE**

---

**Respiratory Protection:**

AVOID BREATHING VAPOR AND/OR MIST. USE WITH ADEQUATE VENTILATION.

**Ventilation:**

N/K

**Protective Gloves:**

YES

**Eye Protection:** SAFETY GLASSES

**Other Protective Equipment:** WEAR PROTECTIVE CLOTHING AND GLOVES IF PROLONGED OR REPEATED CONTACT IS LIKELY.

**Work Hygienic Practices:** N/K

**Supplemental Health & Safety Information:** N/K

---

**Section 9 - Physical & Chemical Properties**  
**UNLEADED REGULAR GASOLINE**

---

**HCC:**

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point:** Boiling Point Text: 80F TO 430F

**Melting/Freezing Point:** Melting/Freezing Text: N/K

**Decomposition Point:** Decomposition Text: N/K

**Vapor Pressure:** 9-15 D-323 Vapor Density: 3 TO 4

**Percent Volatile Organic Content:**

**Specific Gravity:** H2O=1 0.75

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/K

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** N/K

**Solubility in Water:** NEGLIGIBLE BELOW 0.1

**Appearance and Odor:** CLEAR,BRIGHT LIQUID.CHARACTERISTIC ODOR

**Percent Volatiles by Volume:** N/K

**Corrosion Rate:** N/K

---

**Section 10 - Stability & Reactivity Data  
UNLEADED REGULAR GASOLINE**

---

**Stability Indicator:** YES

**Materials to Avoid:**

AVOID STRONG OXIDIZERS

**Stability Condition to Avoid:**

N/K

**Hazardous Decomposition Products:**

N/K

**Hazardous Polymerization Indicator:** N/P

**Conditions to Avoid Polymerization:**

N/K

---

**Section 11 - Toxicological Information  
UNLEADED REGULAR GASOLINE**

---

**Toxicological Information:**

N/P

---

**Section 12 - Ecological Information  
UNLEADED REGULAR GASOLINE**

---

**Ecological Information:**

N/P

---

**Section 13 - Disposal Considerations  
UNLEADED REGULAR GASOLINE**

---

**Waste Disposal Methods:**

ENCLOSED-CONTROLLED INCINERATION IS RECOMMENDED UNLESS DIRECTED OTHERWISE BY APPLICABLE ORDINANCES.

---

**Section 14 - MSDS Transport Information  
UNLEADED REGULAR GASOLINE**

---

**Transport Information:**

N/P

---

**Section 15 - Regulatory Information  
UNLEADED REGULAR GASOLINE**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information**  
**UNLEADED REGULAR GASOLINE**

---

**Other Information:**

N/P

**HAZCOM Label Information**

**Product Identification:** UNLEADED REGULAR GASOLINE

**CAGE:** 15958

**Assigned Individual:** N

**Company Name:** AMOCO OIL CO

**Company PO Box:**

**Company Street Address1:** 200 E RANDOLPH DR MC 1408

**Company Street Address2:** CHICAGO, IL 60601-6401 US

**Health Emergency Telephone:** 800 447-8735

**Label Required Indicator:** Y

**Date Label Reviewed:** 12/16/1998

**Status Code:** C

**Manufacturer's Label Number:**

**Date of Label:** 12/16/1998

**Year Procured:** N/K

**Organization Code:** G

**Chronic Hazard Indicator:** N/P

**Eye Protection Indicator:** N/P

**Skin Protection Indicator:** N/P

**Respiratory Protection Indicator:** N/P

**Signal Word:** N/P

**Health Hazard:**

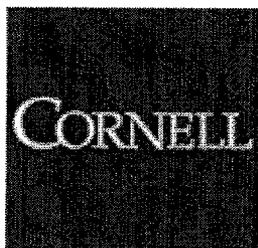
**Contact Hazard:**

**Fire Hazard:**

**Reactivity Hazard:**

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**Material Safety  
Data Sheets**

**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
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**XYLENE**

<u>Section 1 - Product and Company Identification</u>	<u>Section 9 - Physical &amp; Chemical Properties</u>
<u>Section 2 - Composition/Information on Ingredients</u>	<u>Section 10 - Stability &amp; Reactivity Data</u>
<u>Section 3 - Hazards Identification Including Emergency Overview</u>	<u>Section 11 - Toxicological Information</u>
<u>Section 4 - First Aid Measures</u>	<u>Section 12 - Ecological Information</u>
<u>Section 5 - Fire Fighting Measures</u>	<u>Section 13 - Disposal Considerations</u>
<u>Section 6 - Accidental Release Measures</u>	<u>Section 14 - MSDS Transport Information</u>
<u>Section 7 - Handling and Storage</u>	<u>Section 15 - Regulatory Information</u>
<u>Section 8 - Exposure Controls &amp; Personal Protection</u>	<u>Section 16 - Other Information</u>

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**Section 1 - Product and Company Identification  
XYLENE**

**Product Identification:** XYLENE

**Date of MSDS:** 02/28/1990 **Technical Review Date:** 08/10/1995

**FSC:** 6810 **NIIN:** LIIN: 00N012651

**Submitter:** N EN

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** MARSH LABORATORIES  
**Manufacturer's Address1:** 2437 WAVERLY AVE  
**Manufacturer's Address2:** PITTSBURGH, PA 15218  
**Manufacturer's Country:** US  
**General Information Telephone:** 412-271-3060  
**Emergency Telephone:** 412-271-3060  
**Emergency Telephone:** 412-271-3060  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** N  
**Published:** Y  
**CAGE:** 0TUN7  
**Special Project Code:** N

**Contractor Information**

**Contractor's Name:** MARSH LABORATORIES  
**Contractor's Address1:** 2437 WAVERLY AVE  
**Contractor's Address2:** PITTSBURG, PA 15218  
**Contractor's Telephone:** 412-271-3060  
**Contractor's CAGE:** 0TUN7

---

**Section 2 - Compositon/Information on Ingredients**  
**XYLENE**

---

**Ingredient Name:** XYLENE (SARA III)  
**Ingredient CAS Number:** 1330-20-7 **Ingredient CAS Code:** M  
**RTECS Number:** ZE2100000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** 100  
**% Enviromental Weight:**  
**Other REC Limits:** N/K  
**OSHA PEL:** 100 PPM;150 PPM STEL **OSHA PEL Code:** M  
**OSHA STEL: OSHA STEL Code:**  
**ACGIH TLV:** 100 PPM;150 PPM STEL **ACGIH TLV Code:** M  
**ACGIH STEL: N/P ACGIH STEL Code:**  
**EPA Reporting Quantity:** 1000 LBS  
**DOT Reporting Quantity:** 1000 LBS  
**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview****XYLENE**

---

**Health Hazards Acute & Chronic:** EYES:CAN CAUSE SEVERE IRRITATION, TEARING, BLURRED VISION. SKIN:PROLONGED CONTACT MAY CAUSE MODERATE IRRITATION. INGEST:CAN CAUSE GI IRRITATION, NAUSEA, VOMITING & DIARRHEA. INHAL:CAN CAUSE NASAL & RE SPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS & EVEN (EFTS OF OVEREXP)

**Signs & Symptoms of Overexposure:**

HLTH HAZ:ASPHYXIATION IF LARGE AMOUNTS ARE INHALED.

**Medical Conditions Aggravated by Exposure:**

PRE-EXISTING SKIN CONDITIONS.

**LD50 LC50 Mixture:** NONE SPECIFIED BY MANUFACTURER.

**Route of Entry Indicators:**

**Inhalation:** YES

**Skin:** YES

**Ingestion:** YES

**Carcenogenicity Indicators**

**NTP:** NO

**IARC:** NO

**OSHA:** NO

**Carcinogenicity Explanation:** NOT RELEVANT

---

**Section 4 - First Aid Measures****XYLENE**

---

**First Aid:**

EYES:FLUSH IMMEDIATELY W/LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN:WASH W/SOAP & WATER. INGEST:DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ATTENTION. INHAL:REMOVE TO FRESH AIR. ADMINISTER OXYGEN IF BREATHING IS DIFFICULT, ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.

---

**Section 5 - Fire Fighting Measures****XYLENE**

---

**Fire Fighting Procedures:**

USE NIOSH/MSHA APPROVED SCBA & FULL PROT EQUIP (FP N). MATERIAL IS FLAMMABLE LIQUID. WATER MAY BE INEFTIVE IN CONTROLLING FIRE. USE APPROP EXTING MEDIA.

**Unusual Fire or Explosion Hazard:**

NONE

**Extinguishing Media:**

WATER FOG, ALCOHOL FOAM, DRY CHEMICAL.

**Flash Point:** Flash Point Text: 80.0F,26.7C

**Autoignition Temperature:****Autoignition Temperature Text:** N/A**Lower Limit(s):** 1%**Upper Limit(s):** 6%

---

**Section 6 - Accidental Release Measures****XYLENE**

---

**Spill Release Procedures:**

ELIMINATE ALL IGNITION SOURCES. DIKE AREA TO PREVENT SPREADING. ABSORB W/PAPER, VERMICULITE OR OTHER ABSORBENT MATERIAL. TRANSFER TO HOOD OR CONTAINERS.

---

**Section 7 - Handling and Storage****XYLENE**

---

**Handling and Storage Precautions:****Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection****XYLENE**

---

**Respiratory Protection:**

NIOSH/MSHA APPROVED SCBA IF TLV IS EXCEEDED.

**Ventilation:**

LOCAL EXHAUST.

**Protective Gloves:**

RUBBER GLOVES.

**Eye Protection:** ANSI APRV CHEMICAL WORKERS GOGGLES (FP N)

**Other Protective Equipment:** PROTECTIVE APRON.

**Work Hygienic Practices:** USE GOOD INDUSTRIAL HYGIENE PRACTICES.

**Supplemental Health & Safety Information:** NONE SPECIFIED BY MANUFACTURER.

---

**Section 9 - Physical & Chemical Properties****XYLENE**

---

**HCC:** F4

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point:** Boiling Point Text: 279F,137C

**Melting/Freezing Point:** Melting/Freezing Text: N/A

**Decomposition Point:** Decomposition Text: N/K

**Vapor Pressure:** 19.4 @ 68F Vapor Density: 3.6

**Percent Volatile Organic Content:**

**Specific Gravity:** 0.872 (H\*2O=1)

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/K

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** 0.75 (BUTYL ACETATE=1)  
**Solubility in Water:** NO - INSOLUBLE  
**Appearance and Odor:** COLORLESS LIQUID; ODOR DETECTABLE.  
**Percent Volatiles by Volume:** N/K  
**Corrosion Rate:** N/K

---

**Section 10 - Stability & Reactivity Data**  
**XYLENE**

---

**Stability Indicator:** YES  
**Materials to Avoid:**  
OXIDIZING MATERIAL.  
**Stability Condition to Avoid:**  
NOT APPLICABLE  
**Hazardous Decomposition Products:**  
NONE  
**Hazardous Polymerization Indicator:** NO  
**Conditions to Avoid Polymerization:**  
NOT RELEVANT

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**Section 11 - Toxicological Information**  
**XYLENE**

---

**Toxicological Information:**  
N/P

---

**Section 12 - Ecological Information**  
**XYLENE**

---

**Ecological Information:**  
N/P

---

**Section 13 - Disposal Considerations**  
**XYLENE**

---

**Waste Disposal Methods:**  
INCINERATE I/A/W FEDERAL, STATE & LOCAL REGULATIONS. SMALL SPILLS MAY BE ALLOWED TO EVAPORATE UNDER CHEMICAL HOOD. MATERIAL COLLECTED IN ABSORBANT MATERIAL MAY BE DEPOSITED IN A POSTED TOXIC LANDFILL I/A/W FEDERAL, STATE & LOCAL REGULATIONS.

---

**Section 14 - MSDS Transport Information**  
**XYLENE**

---

**Transport Information:**  
N/P

---

**Section 15 - Regulatory Information**  
**XYLENE**

---

**SARA Title III Information:**  
N/P

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**Federal Regulatory Information:**

N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information**  
**XYLENE**

---

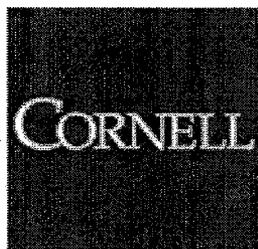
**Other Information:**

N/P

**HAZCOM Label Information****Product Identification:** XYLENE**CAGE:** 0TUN7**Assigned Individual:** N**Company Name:** MARSH LABORATORIES**Company PO Box:****Company Street Address1:** 2437 WAVERLY AVE**Company Street Address2:** PITTSBURG, PA 15218 US**Health Emergency Telephone:** 412-271-3060**Label Required Indicator:** Y**Date Label Reviewed:** 08/18/1993**Status Code:** C**Manufacturer's Label Number:****Date of Label:** 08/18/1993**Year Procured:** N/K**Organization Code:** G**Chronic Hazard Indicator:** N**Eye Protection Indicator:** YES**Skin Protection Indicator:** YES**Respiratory Protection Indicator:** YES**Signal Word:** DANGER**Health Hazard:** Moderate**Contact Hazard:** Moderate**Fire Hazard:** Severe**Reactivity Hazard:** None

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**Material Safety  
Data Sheets**

**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**719,ETHYLBENZENE**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

**Section 1 - Product and Company Identification  
719,ETHYLBENZENE**

**Product Identification:** 719,ETHYLBENZENE

**Date of MSDS:** 01/01/1985 **Technical Review Date:** 02/18/1983

**FSC:** 6810 **NIIN:** LIIN: 00K000829

**Submitter:** D DG

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** EASTMAN KODAK COMPANY  
**Manufacturer's Address1:** 343 STATE STREET  
**Manufacturer's Address2:** ROCHESTER, NY 14650  
**Manufacturer's Country:** US  
**General Information Telephone:** 716-722-5151  
**Emergency Telephone:** 716-722-5151  
**Emergency Telephone:** 716-722-5151  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 19139  
**Special Project Code:** N

**Contractor Information**

**Contractor's Name:** EASTMAN KODAK CO GOVERNMENT MARKETS CONTRACTS  
**Contractor's Address1:** 343 STATE ST  
**Contractor's Address2:** ROCHESTER, NY 14650-1115  
**Contractor's Telephone:** 716-722-5151/(800) 242-2424  
**Contractor's CAGE:** 19139

---

**Section 2 - Composition/Information on Ingredients**  
**719,ETHYLBENZENE**

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**Ingredient Name:** ETHYL BENZENE (SARA III)  
**Ingredient CAS Number:** 100-41-4 **Ingredient CAS Code:** M  
**RTECS Number:** DA0700000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** 100  
**% Environmental Weight:**  
**Other REC Limits:** N/P  
**OSHA PEL:** 100 PPM/125 STEL **OSHA PEL Code:** M  
**OSHA STEL:** **OSHA STEL Code:**  
**ACGIH TLV:** 100 PPM/125 STEL 9192 **ACGIH TLV Code:** M  
**ACGIH STEL:** N/P **ACGIH STEL Code:**  
**EPA Reporting Quantity:** 1000 LBS  
**DOT Reporting Quantity:** 1000 LBS  
**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**719,ETHYLBENZENE**

---

**Health Hazards Acute & Chronic:** N/P**Signs & Symptoms of Overexposure:**  
VAPORS IRRITAT EYES,RESPIR TRACT AND SKIN.**Medical Conditions Aggravated by Exposure:**  
N/P**LD50 LC50 Mixture:** N/P**Route of Entry Indicators:****Inhalation:** N/P**Skin:** N/P**Ingestion:** N/P**Carcenogenicity Indicators****NTP:** N/P**IARC:** N/P**OSHA:** N/P**Carcinogenicity Explanation:** N/P

---

**Section 4 - First Aid Measures**  
**719,ETHYLBENZENE**

---

**First Aid:**

INHALE:REMOVE TO FRESH AIR,GIVE CPR/O\*2 IF NEED.EYES/SKIN:FLUSH WITH LG AMTS H\*20 FOR 15 MIN.

---

**Section 5 - Fire Fighting Measures**  
**719,ETHYLBENZENE**

---

**Fire Fighting Procedures:**

SELF-CNTND BRTHG APP,H\*20 SPRAY COOL CONT,KNOCK DOWN VAPOR.

**Unusual Fire or Explosion Hazard:**

CONT MAY EXPLODE IN HEAT OF FIRE.SPILL/RUNOFF MAY POLLUTE,CAUSE FIRE OR EXPLOSION

**Extinguishing Media:**

CO\*2,DRY CHEMICAL

**Flash Point:** Flash Point Text: 59F/15C**Autoignition Temperature:****Autoignition Temperature Text:** N/A**Lower Limit(s):** 1.0**Upper Limit(s):** UNK

---

**Section 6 - Accidental Release Measures**  
**719,ETHYLBENZENE**

---

**Spill Release Procedures:**

ELIMINATE IGNITION SOURCES.ABSORB SPILLED MATERIAL W.VERMICULITE.PLACE IN FIBER CARTON.WASH SPILL AREA WELL WITH SOAP & WATER.

---

**Section 7 - Handling and Storage**  
**719,ETHYLBENZENE**

---

**Handling and Storage Precautions:****Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**719,ETHYLBENZENE**

---

**Respiratory Protection:**

CONTROL VAPOR CONC BY LOCAL EXHAUST.

**Ventilation:**

MECHANICAL/LOCAL FOR CONTROLLING VAPOR TO TLV(100 PPM)

**Protective Gloves:**

IMPERVIOUS

**Eye Protection:** SAFETY/CHEM GOGGLES.

**Other Protective Equipment:** NORMAL FULL CLOTHING COVERING ARMS AND LEGS.

**Work Hygenic Practices:** N/P

**Supplemental Health & Safety Information:** N/P

---

**Section 9 - Physical & Chemical Properties**  
**719,ETHYLBENZENE**

---

**HCC:** F3

**NRC/State License Number:**

**Net Property Weight for Ammo:**

**Boiling Point: Boiling Point Text:** 277F/136C

**Melting/Freezing Point: Melting/Freezing Text:** N/A

**Decomposition Point: Decomposition Text:** N/A

**Vapor Pressure: 10 Vapor Density:** 3.66

**Percent Volatile Organic Content:**

**Specific Gravity:** 0.866

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/P

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** UNKNOWN

**Solubility in Water:** NEGLIGIBLE

**Appearance and Odor:** COLORLESS LIQUID,AROMATIC ODOR.

**Percent Volatiles by Volume:** 100

**Corrosion Rate:** N/P

---

**Section 10 - Stability & Reactivity Data**

---

**719,ETHYLBENZENE**

---

**Stability Indicator:** YES**Materials to Avoid:**

NONE

**Stability Condition to Avoid:**

NONE

**Hazardous Decomposition Products:**

CO\*2,CO

**Hazardous Polymerization Indicator:** NO**Conditions to Avoid Polymerization:**N/P

---

**Section 11 - Toxicological Information**  
**719,ETHYLBENZENE**

---

**Toxicological Information:**N/P

---

**Section 12 - Ecological Information**  
**719,ETHYLBENZENE**

---

**Ecological Information:**N/P

---

**Section 13 - Disposal Considerations**  
**719,ETHYLBENZENE**

---

**Waste Disposal Methods:**MIX WITH FLAMMABLE SOLVENT,SPRAY INTO INCINERATOR EQUIPPED WITH AFTERBURNER AND SCRUBBER.STATE AND LOCAL LAWS TAKE PRECEDENCE.

---

**Section 14 - MSDS Transport Information**  
**719,ETHYLBENZENE**

---

**Transport Information:**N/P

---

**Section 15 - Regulatory Information**  
**719,ETHYLBENZENE**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**N/P

---

**Section 16 - Other Information**  
**719,ETHYLBENZENE**

---

**Other Information:**

N/P

**HMIS Transportation Information****Product Identification:** 719,ETHYLBENZENE**Transportation ID Number:** 9874**Responsible Party CAGE:** 19139**Date MSDS Prepared:** 01/01/1985**Date MSDS Reviewed:** 02/18/1983**MFN:** 02/18/1983**Submitter:** D DG**Status Code:** C**Container Information****Unit of Issue:** NK**Container Quantity:** NK**Type of Container:****Net Unit Weight:****Article without MSDS:** N**Technical Entry NOS Shipping Number:****Radioactivity:****Form:****Net Explosive Weight:****Coast Guard Ammunition Code:****Magnetism:** N/P**AF MMAC Code:****DOD Exemption Number:****Limited Quantity Indicator:****Multiple Kit Number:** 0**Kit Indicator:** N**Kit Part Indicator:** N**Review Indicator:** Y**Additional Data:**

ITEM UNDER CAT #719 IS ALSO AVAILABLE IN 1 KG QUANTITIES.FLASHPOINT METHOD NOT IDENTIFIED.

**Department of Transportation Information****DOT Proper Shipping Name:** ETHYLBENZENE**DOT PSN Code:** FYP**Symbols:****DOT PSN Modifier:****Hazard Class:** 3**UN ID Number:** UN1175**DOT Packaging Group:** II**Label:** FLAMMABLE LIQUID**Special Provision(s):** T1**Packaging Exception:** 150**Non Bulk Packaging:** 202**Bulk Packaging:** 242**Maximum Quantity in Passenger Area:** 5 L**Maximum Quantity in Cargo Area:** 60 L**Stow in Vessel Requirements:** B

**Requirements Water/Sp/Other:****IMO Detail Information****IMO Proper Shipping Name:** ETHYLBENZENE**IMO PSN Code:** GQL**IMO PSN Modifier:****IMDG Page Number:** 3222**UN Number:** 1175**UN Hazard Class:** 3.2**IMO Packaging Group:** II**Subsidiary Risk Label:** -**EMS Number:** 3-07**Medical First Aid Guide Number:** 310**IATA Detail Information****IATA Proper Shipping Name:** ETHYLBENZENE**IATA PSN Code:** LCB**IATA PSN Modifier:****IATA UN Id Number:** 1175**IATA UN Class:** 3**Subsidiary Risk Class:****UN Packaging Group:** II**IATA Label:** FLAMMABLE LIQUID**Packaging Note for Passengers:** 305**Maximum Quantity for Passengers:** 5L**Packaging Note for Cargo:** 307**Maximum Quantity for Cargo:** 60L**Exceptions:****AFI Detail Information****AFI Proper Shipping Name:** ETHYLBENZENE**AFI Symbols:****AFI PSN Code:** LCB**AFI PSN Modifier:****AFI UN Id Number:** UN1175**AFI Hazard Class:** 3**AFI Packing Group:** II**AFI Label:****Special Provisions:** P5**Back Pack Reference:** A7.3**HAZCOM Label Information****Product Identification:** 719,ETHYLBENZENE**CAGE:** 19139**Assigned Individual:** N**Company Name:** EASTMAN KODAK CO GOVERNMENT MARKETS CONTRACTS**Company PO Box:****Company Street Address1:** 343 STATE ST**Company Street Address2:** ROCHESTER, NY 14650-1115 US**Health Emergency Telephone:** 716-722-5151**Label Required Indicator:** Y**Date Label Reviewed:** 12/16/1998**Status Code:** C**Manufacturer's Label Number:****Date of Label:** 12/16/1998

**Year Procured:** N/K

**Organization Code:** F

**Chronic Hazard Indicator:** N/P

**Eye Protection Indicator:** N/P

**Skin Protection Indicator:** N/P

**Respiratory Protection Indicator:** N/P

**Signal Word:** N/P

**Health Hazard:**

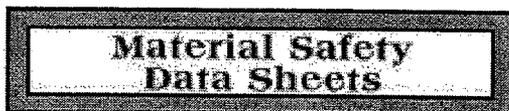
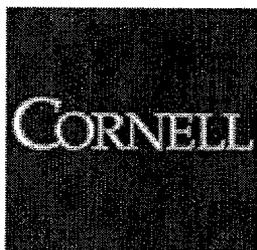
**Contact Hazard:**

**Fire Hazard:**

**Reactivity Hazard:**

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**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
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**BENZENE**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
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Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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**Section 1 - Product and Company Identification  
BENZENE**

**Product Identification:** BENZENE  
**Date of MSDS:** 01/08/1996 **Technical Review Date:** 05/08/1999  
**FSC:** 6810 **NIIN:** 00-753-4778  
**Submitter:** D DG  
**Status Code:** C  
**MFN:** 01  
**Article:** N  
**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** FISHER SCIENTIFIC, CHEMICAL DIV.  
**Manufacturer's Address1:** 1 REAGENT LANE  
**Manufacturer's Address2:** FAIR LAWN, NJ 07410  
**Manufacturer's Country:** US  
**General Information Telephone:** 201-796-7100 OR 201-796-7523  
**Emergency Telephone:** 201-796-7100/800-424-9300(CHEMTREC)  
**Emergency Telephone:** 201-796-7100/800-424-9300(CHEMTREC)  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 1B464  
**Special Project Code:** N

**Item Description**

**Item Name:** BENZENE,ACS  
**Item Manager:**  
**Specification Number:** NK  
**Type/Grade/Class:** NK  
**Unit of Issue:** BT  
**Unit of Issue Quantity:** 1  
**Type of Container:** BOTTLE

**Contractor Information**

**Contractor's Name:** FISHER SCIENTIFIC CO. CHEMICAL MFG DIV  
**Contractor's Address1:** 1 REAGENT LANE  
**Contractor's Address2:** FAIR LAWN, NJ 07410-2802  
**Contractor's Telephone:** 201-796-7100  
**Contractor's CAGE:** 1B464

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**Section 2 - Compositon/Information on Ingredients**  
**BENZENE**

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**Ingredient Name:** BENZENE (SARA 313) (CERCLA)  
**Ingredient CAS Number:** 71-43-2 **Ingredient CAS Code:** M  
**RTECS Number:** CY1400000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text: >99**

**% Environmental Weight:****Other REC Limits:** NONE RECOMMENDED**OSHA PEL:** SEE 1910.1028 **OSHA PEL Code:** M**OSHA STEL:** **OSHA STEL Code:****ACGIH TLV:** 10 PPM; A2; 9596 **ACGIH TLV Code:** M**ACGIH STEL:** N/P **ACGIH STEL Code:****EPA Reporting Quantity:** 10 LBS**DOT Reporting Quantity:** 10 LBS**Ozone Depleting Chemical:** N**Section 3 - Hazards Identification, Including Emergency Overview****BENZENE**

**Health Hazards Acute & Chronic:** EYE:IRRIT,CORNEAL INJURY.SKIN:IRRIT,ABSORBED THRU SKIN IN HARMFUL ATMS.INGEST:ASPIRATION HAZ.CNS DEPRESSDEATH DUE TO RESP FAILURE,ASPIRATION INTO LUNGS MAY CAUSE CHEM PNEUMONITIS-FATAL.INHA:RESP TRACT IRRIT,CNS EFFECTS/DEPRESS.IRREVERSIBLEINJURY TO BONE MARROW,IRRIT EYE/RESP TRACT.CHRONIC:CAN HAZ W/LAB ANIMALS.(SUPPL)

**Signs & Symptoms of Overexposure:**

EYE:BURN SENS,RED,TEAR,INFLAMM,CORNEAL INJURY.SKIN:REDNESS,VESIVULATION.INGEST:EXITEMENT,HEAD,DIZZ,DROWS,NAU,COI DEPRESS.EUPHORIA,NAU,S TAGGERING GAIT,COMA,VERTIGO,LOSS OF APETITE,ABD DISCOMFT,BLUR VISION,DIFFI BREATH,WEAK,MUC MEMB/SKIN PALE,HEMNORRHAGIC

**Medical Conditions Aggravated by Exposure:**

NONE SPECIFIED BY MANUFACTURER.

**LD50 LC50 Mixture:** LD50 ORAL RAT =930MG/KG**Route of Entry Indicators:****Inhalation:** YES**Skin:** YES**Ingestion:** YES**Carcenogenicity Indicators****NTP:** YES**IARC:** YES**OSHA:** YES

**Carcinogenicity Explanation:** PER MSDS:CARCINOGENICTY:ACGIH-A2 SUSP HUMAN CARC;CA-CARC;NIOSH-OCCUPAT CARC;NTP-KNOWN CARC;OSHA-SELECT CARC;IARC-GROUP I

**Section 4 - First Aid Measures****BENZENE****First Aid:**

EYE:FLUSH W/LOTS OF H2O FOR @LEAT 15MIN,OCCASIONALLY LIFT UP/LOW LIDS.GET MED AID IMMED.SKIN:GET MED AID IMMED.IMMED FLUSH W/PLENTY OF SOAP/WATER

FOR @LEAST 15MINS WHILE REMOVING CONTAM CLOTH/SHOES.IN GEST:DONT INDUCE VOMIT.CONSC/ALERT GIVE2-4C MILK/H2O.POSSIBLE ASPIRATION HA.GET MED AID IMMED.INHAL:GET MED AID IMMED.REMOVE TO FRESH AIR IMMED.NOT BREATH GIVE ART RESP;DIFFI GIVE OXY.DR:TREAT (SUPP)

---

### Section 5 - Fire Fighting Measures

#### BENZENE

---

**Fire Fighting Procedures:**

WEAR SCBA IN PRESSURE-DEMAND MSHA/NIOSH(APPROV/EQUIV)FULL PROT GEAR.H2O RUNOFF CAN CAUSE ENVIRO DMG.DIKE/COLLECT.USE WATERSPRAY OT KEEP FIRE-EXPO CNTNR COOL.

**Unusual Fire or Explosion Hazard:**

VAP CAN TRAVEL TO SOURCE OF IGN & FLASHBACK.EXTREMELY FLAMM.MATL WILL READILY IGNITE @RM TEMPS.

**Extinguishing Media:**

USE WATERSPRAY TO COLL FIRE-EXPO CNTNRS.IN CASE OF FIRE USE WATERSPRAY,DRY CHEMICAL,CO2, CHEM FOAM.

**Flash Point: Flash Point Text:** 12F,-11C

**Autoignition Temperature:**

**Autoignition Temperature Text:** 928F

**Lower Limit(s):** 1.3

**Upper Limit(s):** 7.1

---

### Section 6 - Accidental Release Measures

#### BENZENE

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**Spill Release Procedures:**

USE PROPER PPE PER MSDS.USE H2OSPRAY TO DIL SPILL TO NONFLAMM.AVOID RUNOFF INTO STORM SEWER/DITCH LEADS TO H2OWAYS.WEAR SCBA,APPROP PPE.DISPERSE GAS/VAP W/2HOSPRAY.REMOVE ALL IGN SOURCES.ABSORB USING ABSORBENT,NON-COMBUST MATL-EARTH,SAND,VERMICULITE.

---

### Section 7 - Handling and Storage

#### BENZENE

---

**Handling and Storage Precautions:****Other Precautions:**

---

### Section 8 - Exposure Controls & Personal Protection

#### BENZENE

---

**Respiratory Protection:**

FOLLOW OSHA RESPIRATOR REGULATIONS FOUND IN 29CFR1910.134.ALWAYS USE NIOSH APPROVED RESPIRATOR WHEN NECESSARY.

**Ventilation:**

USE ONLY IN CHEMICAL FUME HOODS.

**Protective Gloves:**

IMPERVIOUS GLOVES

**Eye Protection:** APPROP PROT EYEGLASSE,CHEM SAF GOGG

**Other Protective Equipment:** WEAR APPROP PROT CLOTH TO PREVENT SKIN EXPO.EYE  
PROT:29CFR1910.133.

**Work Hygenic Practices:** WASH WELL AFT HNDLG.REMOVE CONTAM CLOTH-WASH BEF  
REUSE.

**Supplemental Health & Safety Information:** HEALTH:PROL/REP EXPO MAY CAUSE ADVERSE  
REPROD EFFECTS,BONE MARROW ABN W/DMG TO BLOOD FORM TISSUES.INCR  
LEUKEMIA,MULTIPLE MYELOMAS,IMMUNODEPRESS EFFECTS,DRY/SCALY DERM/2ND  
INFECTIONS. 1STAID:SYMPT/SUPP . INCOMPT:ANHYDRIDE,NITRUL  
PERCHLORATE,OXY,OZONE,PERCHLORATES,PERCHLORYL  
FLUORIDE+AL3CL,PERMANGANATES+H2SO4,AGCLO4,K2O2.

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### Section 9 - Physical & Chemical Properties BENZENE

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**HCC:** F2

**NRC/State License Number:** N/R

**Net Property Weight for Ammo:** N/R

**Boiling Point: Boiling Point Text:** 176F,80C

**Melting/Freezing Point: Melting/Freezing Text:** 42.0F,5.6C

**Decomposition Point: Decomposition Text:** N/AVAI

**Vapor Pressure:** 100 **Vapor Density:** 2.7

**Percent Volatile Organic Content:**

**Specific Gravity:** 0.88

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/AVAI

**Volatile Organic Content Grams per Liter:**

**Viscosity:** 0.647MPA @20C

**Evaporation Weight and Reference:** 2.8, ETHER=1

**Solubility in Water:** 0.18G/110G H2O @25C

**Appearance and Odor:** LIQUID, COLORLESS, SWEET, AROMATIC ODOR

**Percent Volatiles by Volume:** NP

**Corrosion Rate:** NP

---

### Section 10 - Stability & Reactivity Data BENZENE

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**Stability Indicator:** YES

**Materials to Avoid:**

ARSENIC PENTAFLUORIDE+K,OXIDANTS,URANIUM HEXAFLUORIDE,BROME  
PENTAFLUORIDE,CHLORINE,CHLORINE TRIFLUORIDE,CHROMIC(SUPPLE)

**Stability Condition to Avoid:**

INCOMPATIBLES MATLS, IGNITON SOURCES,EXCESS HEAT.

**Hazardous Decomposition Products:**

IRRITATING & TOXIC FUMES & GASES

**Hazardous Polymerization Indicator:** NO

**Conditions to Avoid Polymerization:**

NOT APPLICABLE

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### Section 11 - Toxicological Information

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**BENZENE**

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**Toxicological Information:**N/P

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**Section 12 - Ecological Information****BENZENE**

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**Ecological Information:**N/P

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**Section 13 - Disposal Considerations****BENZENE**

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**Waste Disposal Methods:**DISPO IN MANNER CONSISTEN W/FED/STATE/LOC REGS.BANNED FROM LAND DISPO  
ACCORDING TO RCRA.RCRA WASTE #-D018,U019.

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**Section 14 - MSDS Transport Information****BENZENE**

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**Transport Information:**N/P

---

**Section 15 - Regulatory Information****BENZENE**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**N/P

---

**Section 16 - Other Information****BENZENE**

---

**Other Information:**

N/P

**HMIS Transportation Information****Product Identification:** BENZENE**Transporation ID Number:** 84014**Responsible Party CAGE:** 1B464**Date MSDS Prepared:** 01/08/1996**Date MSDS Reviewed:** 10/24/1997**MFN:** 10/24/1997**Submitter:** D DG**Status Code:** C**Container Information****Unit of Issue:** BT**Container Quantity:** 1

**Type of Container:** BOTTLE

**Net Unit Weight:** 1.96 LBS

**Article without MSDS:** N

**Technical Entry NOS Shipping Number:**

**Radioactivity:**

**Form:**

**Net Explosive Weight:**

**Coast Guard Ammunition Code:**

**Magnetism:** N/P

**AF MMAC Code:**

**DOD Exemption Number:**

**Limited Quantity Indicator:**

**Multiple Kit Number:** 0

**Kit Indicator:** N

**Kit Part Indicator:** N

**Review Indicator:** Y

**Additional Data:**

PER MSDS:SHIPPING NAME:RQ,BENZENE,3,UN1114,PGK II;IMD/IATA/AOR:NO INFO AVAILABLE.

#### **Department of Transportation Information**

**DOT Proper Shipping Name:** BENZENE

**DOT PSN Code:** BRS

**Symbols:**

**DOT PSN Modifier:**

**Hazard Class:** 3

**UN ID Number:** UN1114

**DOT Packaging Group:** II

**Label:** FLAMMABLE LIQUID

**Special Provision(s):** B101,T8

**Packaging Exception:** 150

**Non Bulk Packaging:** 202

**Bulk Packaging:** 242

**Maximum Quantity in Passenger Area:** 5 L

**Maximum Quantity in Cargo Area:** 60 L

**Stow in Vessel Requirements:** B

**Requirements Water/Sp/Other:** 40

#### **IMO Detail Information**

**IMO Proper Shipping Name:** BENZENE

**IMO PSN Code:** BXB

**IMO PSN Modifier:**

**IMDG Page Number:** 3185

**UN Number:** 1114

**UN Hazard Class:** 3.2

**IMO Packaging Group:** II

**Subsidiary Risk Label:** -

**EMS Number:** 3-03

**Medical First Aid Guide Number:** 312

#### **IATA Detail Information**

**IATA Proper Shipping Name:** BENZENE

**IATA PSN Code:** DBA  
**IATA PSN Modifier:**  
**IATA UN Id Number:** 1114  
**IATA UN Class:** 3  
**Subsidiary Risk Class:**  
**UN Packaging Group:** II  
**IATA Label:** FLAMMABLE LIQUID  
**Packaging Note for Passengers:** 305  
**Maximum Quantity for Passengers:** 5L  
**Packaging Note for Cargo:** 307  
**Maximum Quantity for Cargo:** 60L  
**Exceptions:**

#### **AFI Detail Information**

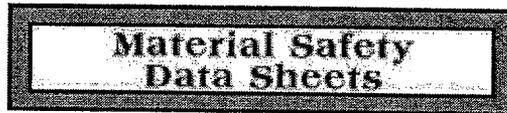
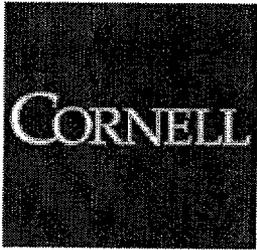
**AFI Proper Shipping Name:** BENZENE  
**AFI Symbols:**  
**AFI PSN Code:** DBA  
**AFI PSN Modifier:**  
**AFI UN Id Number:** UN1114  
**AFI Hazard Class:** 3  
**AFI Packing Group:** II  
**AFI Label:**  
**Special Provisions:** P5  
**Back Pack Reference:** A7.3

#### **HAZCOM Label Information**

**Product Identification:** BENZENE  
**CAGE:** 1B464  
**Assigned Individual:** N  
**Company Name:** FISHER SCIENTIFIC CO. CHEMICAL MFG DIV  
**Company PO Box:**  
**Company Street Address1:** 1 REAGENT LANE  
**Company Street Address2:** FAIR LAWN, NJ 07410-2802 US  
**Health Emergency Telephone:** 201-796-7100/800-424-9300(CHEMTREC)  
**Label Required Indicator:** Y  
**Date Label Reviewed:** 10/24/1997  
**Status Code:** C  
**Manufacturer's Label Number:**  
**Date of Label:** 10/24/1997  
**Year Procured:** N/K  
**Organization Code:** F  
**Chronic Hazard Indicator:** Y  
**Eye Protection Indicator:** YES  
**Skin Protection Indicator:** YES  
**Respiratory Protection Indicator:** YES  
**Signal Word:** DANGER  
**Health Hazard:** Severe  
**Contact Hazard:** Slight  
**Fire Hazard:** Moderate  
**Reactivity Hazard:** None

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**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**DIESEL FUELS**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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**Section 1 - Product and Company Identification  
DIESEL FUELS**

**Product Identification:** DIESEL FUELS

**Date of MSDS:** 05/31/1989 **Technical Review Date:** 12/08/1992

**FSC:** 9140 **NIIN:** 00-419-0450

**Submitter:** D DG

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit-Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** MOBIL CORP  
**Manufacturer's Address1:** 150 E 42ND ST  
**Manufacturer's Address2:** NEW YORK, NY 10017-5612  
**Manufacturer's Country:** US  
**General Information Telephone:** 212-883-4411  
**Emergency Telephone:** 212-883-4411 / 800-424-9300CHEMTREC  
**Emergency Telephone:** 212-883-4411 / 800-424-9300CHEMTREC  
**MSDS Preparer's Name:** ENVIRONMENTAL AFFAIRS  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 57635  
**Special Project Code:** N

**Item Description**

**Item Name:** DIESEL FUEL  
**Item Manager:**  
**Specification Number:** NK  
**Type/Grade/Class:** NK  
**Unit of Issue:** DR **Quantitative Expression:** 00000000475GL  
**Unit of Issue Quantity:** 0  
**Type of Container:**

**Contractor Information**

**Contractor's Name:** MOBIL CORP  
**Contractor's Address1:** 150 E 42ND ST  
**Contractor's Address2:** NEW YORK, NY 10017-5612  
**Contractor's Telephone:** 212-883-4242  
**Contractor's CAGE:** 57635

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**Section 2 - Compositon/Information on Ingredients**  
**DIESEL FUELS**


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**Ingredient Name:** PETROLEUM OIL (DIESEL FUEL)  
**Ingredient CAS Number:** 68334-30-5 **Ingredient CAS Code:** M  
**RTECS Number:** RTECS **Code:** X  
**=WT:** =WT **Code:**  
**=Volume:** =Volume **Code:**  
**>WT:** >WT **Code:**  
**>Volume:** >Volume **Code:**  
**<WT:** <WT **Code:**  
**<Volume:** <Volume **Code:**  
**% Low WT:** % Low WT **Code:**  
**% High WT:** % High WT **Code:**  
**% Low Volume:** % Low Volume **Code:**  
**% High Volume:** % High Volume **Code:**  
**% Text:** 100

**% Environmental Weight:****Other REC Limits:** NONE RECOMMENDED**OSHA PEL:** NOT ESTABLISHED **OSHA PEL Code:** M**OSHA STEL:** **OSHA STEL Code:****ACGIH TLV:** NOT ESTABLISHED **ACGIH TLV Code:** M**ACGIH STEL:** N/P **ACGIH STEL Code:****EPA Reporting Quantity:****DOT Reporting Quantity:****Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**DIESEL FUELS**

---

**Health Hazards Acute & Chronic:** ACUTE EXPOSURES: SLIGHT SKIN IRRITATION, RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS. CHRONIC EXPOSURE: THIS PRODUCT MAY CONTAIN TRACE QUANTITIES OF POLYCYCLIC HYDROCARBONS. UNDER CONDITIONS OF POOR PERSONAL HYGIENE AND PROLONGED AND REPEATED CONTACT, SOME HAVE BEEN SUSPECTED OF SKIN CARCINOGENICITY

**Signs & Symptoms of Overexposure:**

SLIGHT SKIN IRRITATION, RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS.

**Medical Conditions Aggravated by Exposure:**

SUPPLIER DID NOT ADDRESS THIS FIELD.

**LD50 LC50 Mixture:** ORAL LD50 (RAT) IS UNKNOWN

**Route of Entry Indicators:****Inhalation:** YES**Skin:** YES**Ingestion:** YES**Carcinogenicity Indicators****NTP:** NO**IARC:** NO**OSHA:** NO

**Carcinogenicity Explanation:** SEE HEALTH HAZARDS.

---

**Section 4 - First Aid Measures**  
**DIESEL FUELS**

---

**First Aid:**

**EYE:** FLUSH WITH WATER. **SKIN:** WASH CONTACT AREAS WITH SOAP & WATER. **INHALED:** REMOVE FROM EXPOSURE. IF UNCONSCIOUSNESS OCCURS SEEK IMMEDIATE MEDICAL ASSISTANCE. IF BREATHING HAS STOPPED, GIVE MOUTH TO MOUTH RESUSCITATION. **INGESTED:** DO NOT INDUCE VOMITING. ADMINISTER VEGETABLE OIL. GET MEDICAL ASSISTANCE. (PHYSICIAN: IF MATERIAL IS ASPIRATED INTO LUNGS, MAY CAUSE CHEMICAL PNEUMONITIS; TREAT ACCORDINGLY.)

---

**Section 5 - Fire Fighting Measures**  
**DIESEL FUELS**

---

**Fire Fighting Procedures:**

FOR FIRES IN ENCLOSED AREAS, FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS.

**Unusual Fire or Explosion Hazard:**

MATERIAL IS COMBUSTABLE.

**Extinguishing Media:**

USE CARBON DIOXIDE, FOAM, DRY CHEMICAL OR WATER FOG.

**Flash Point:** Flash Point Text: 100F,38C

**Autoignition Temperature:**

**Autoignition Temperature Text:** N/K

**Lower Limit(s):** UNKNOWN

**Upper Limit(s):** UNKNOWN

---

**Section 6 - Accidental Release Measures**  
**DIESEL FUELS**

---

**Spill Release Procedures:**

ABSORB ON FIRE RETARDENT SAWDUST, DIATOMACEOUS EARTH, ETC.. SHOVEL UP AND DISPOSE AT AN APPROPRIATE WASTE DISPOSAL FACILITY I/A/W CURRENT FEDERAL, STATE & LOCAL REGULATIONS AT TIME OF DISPOSAL.

---

**Section 7 - Handling and Storage**  
**DIESEL FUELS**

---

**Handling and Storage Precautions:****Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**DIESEL FUELS**

---

**Respiratory Protection:**

NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE WITH ADEQUATE VENTILATION.

**Ventilation:**

EXPLOSION PROOF LOCAL AND MECHANICAL EXHAUST TO MAINTAIN ADEQUATE VENTILATION IS DESIRABLE.

**Protective Gloves:**

IMPERVIOUS

**Eye Protection:** NO SPECIAL EQUIPMENT REQUIRED.

**Other Protective Equipment:** NO INFORMATION GIVEN BY MFR ON THE MSDS.

**Work Hygienic Practices:** USE GOOD PERSONAL HYGIENE PRACTICES. AVOID PROLONGED/REPEATED CONTACT.

**Supplemental Health & Safety Information:** FROM OTHER PRECAUTIONS: EVEN THOUGH NO HUMAN CONNECTION HAS BEEN FOUND, PRUDENCY INDICATES THAT ADEQUATE

VENTILATION AND/OR RESPIRATORS BE USED.

---

**Section 9 - Physical & Chemical Properties**  
**DIESEL FUELS**

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**HCC:** F4  
**NRC/State License Number:** NONE  
**Net Property Weight for Ammo:** NONE  
**Boiling Point:** Boiling Point Text: 300F,149C  
**Melting/Freezing Point:** Melting/Freezing Text: UNKNOWN  
**Decomposition Point:** Decomposition Text: UNKNOWN  
**Vapor Pressure:** 0.5MM Vapor Density: UNKNOWN  
**Percent Volatile Organic Content:**  
**Specific Gravity:** 0.85  
**Volatile Organic Content Pounds per Gallon:**  
**pH:** N/K  
**Volatile Organic Content Grams per Liter:**  
**Viscosity:** 31-40 SUS  
**Evaporation Weight and Reference:** UNKNOWN  
**Solubility in Water:** UNKNOWN  
**Appearance and Odor:** CLEAR TO AMBER LIQUID, HYDROCARBON ODOR  
**Percent Volatiles by Volume:** N/K  
**Corrosion Rate:** UNKNOWN

---

**Section 10 - Stability & Reactivity Data**  
**DIESEL FUELS**

---

**Stability Indicator:** YES  
**Materials to Avoid:**  
HALOGENS, STRONG ACIDS, ALKALINES AND OXIDIZERS  
**Stability Condition to Avoid:**  
HEAT, SPARKS, FLAME AND BUILD UP OF STATIC ELECTRICITY  
**Hazardous Decomposition Products:**  
CARBON MONOXIDE FROM INCOMPLETE COMBUSTION.  
**Hazardous Polymerization Indicator:** NO  
**Conditions to Avoid Polymerization:**  
WILL NOT OCCUR

---

**Section 11 - Toxicological Information**  
**DIESEL FUELS**

---

**Toxicological Information:**  
N/P

---

**Section 12 - Ecological Information**  
**DIESEL FUELS**

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**Ecological Information:**  
N/P

---

**Section 13 - Disposal Considerations**  
**DIESEL FUELS**

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**Waste Disposal Methods:**

PRODUCT IS SUITABLE FOR BURNING FOR FUEL VALUE I/A/W FEDERAL, STATE & LOCAL LAWS AND REGULATIONS.

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**Section 14 - MSDS Transport Information  
DIESEL FUELS**

---

**Transport Information:**

N/P

---

**Section 15 - Regulatory Information  
DIESEL FUELS**

---

**SARA Title III Information:**

N/P

**Federal Regulatory Information:**

N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information  
DIESEL FUELS**

---

**Other Information:**

N/P

**HMIS Transportation Information**

**Product Identification:** DIESEL FUELS

**Transportation ID Number:** 71458

**Responsible Party CAGE:** 57635

**Date MSDS Prepared:** 05/31/1989

**Date MSDS Reviewed:** 12/08/1992

**MFN:** 12/08/1992

**Submitter:** D DG

**Status Code:** C

**Container Information**

**Unit of Issue:** DR

**Container Quantity:** 0

**Type of Container:**

**Net Unit Weight:** 3540 LBS

**Article without MSDS:** N

**Technical Entry NOS Shipping Number:**

**Radioactivity:** N/R

**Form:**

**Net Explosive Weight:** N/R

**Coast Guard Ammunition Code:** N/R

**Magnetism:** N/P

**AF MMAC Code:**

**DOD Exemption Number:** N/R

**Limited Quantity Indicator:****Multiple Kit Number:** 0**Kit Indicator:** N**Kit Part Indicator:** N**Review Indicator:** Y**Additional Data:**

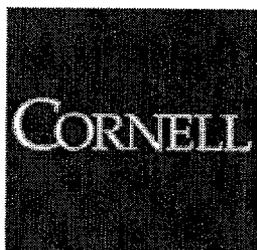
NOTE: NORMALLY AFR 71-4 WOULD BE LISTED AS NOT REGULATED. HOWEVER THIS IS A 500 GAL DRUM.

**Department of Transportation Information****DOT Proper Shipping Name:** GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT**DOT PSN Code:** GTF**Symbols:****DOT PSN Modifier:****Hazard Class:** 3**UN ID Number:** UN1202**DOT Packaging Group:** III**Label:** FLAMMABLE LIQUID**Special Provision(s):** B1,T7,T30**Packaging Exception:** 150**Non Bulk Packaging:** 203**Bulk Packaging:** 242**Maximum Quantity in Passenger Area:** 60 L**Maximum Quantity in Cargo Area:** 220 L**Stow in Vessel Requirements:** A**Requirements Water/Sp/Other:****IMO Detail Information****IMO Proper Shipping Name:** GAS OIL**IMO PSN Code:** HRR**IMO PSN Modifier:****IMDG Page Number:** 3375**UN Number:** 1202**UN Hazard Class:** 3.3**IMO Packaging Group:** III**Subsidiary Risk Label:** -**EMS Number:** 3-07**Medical First Aid Guide Number:** 311**IATA Detail Information****IATA Proper Shipping Name:** GAS OIL**IATA PSN Code:** MTX**IATA PSN Modifier:****IATA UN Id Number:** 1202**IATA UN Class:** 3**Subsidiary Risk Class:****UN Packaging Group:** III**IATA Label:** FLAMMABLE LIQUID**Packaging Note for Passengers:** 309**Maximum Quantity for Passengers:** 60L**Packaging Note for Cargo:** 310**Maximum Quantity for Cargo:** 220L**Exceptions:** A3

**AFI Detail Information****AFI Proper Shipping Name:** GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT**AFI Symbols:****AFI PSN Code:** MTX**AFI PSN Modifier:****AFI UN Id Number:** UN1202**AFI Hazard Class:** 3**AFI Packing Group:** III**AFI Label:****Special Provisions:** P5**Back Pack Reference:** A7.3**HAZCOM Label Information****Product Identification:** DIESEL FUELS**CAGE:** 57635**Assigned Individual:** N**Company Name:** MOBIL CORP**Company PO Box:****Company Street Address1:** 150 E 42ND ST**Company Street Address2:** NEW YORK, NY 10017-5612 US**Health Emergency Telephone:** 212-883-4411 / 800-424-9300CHEMTREC**Label Required Indicator:** Y**Date Label Reviewed:** 12/08/1992**Status Code:** C**Manufacturer's Label Number:** NONE**Date of Label:** 12/08/1992**Year Procured:** 1992**Organization Code:** F**Chronic Hazard Indicator:** N/P**Eye Protection Indicator:** YES**Skin Protection Indicator:** YES**Respiratory Protection Indicator:** YES**Signal Word:** WARNING**Health Hazard:** Slight**Contact Hazard:** Slight**Fire Hazard:** Moderate**Reactivity Hazard:** None

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**Material Safety  
Data Sheets**

**Division of Facilities Services**

**DOD Hazardous Material Information (ANSI Format)  
For Cornell University Convenience Only**

**ETHYLENE GLYCOL**

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
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**Section 1 - Product and Company Identification  
ETHYLENE GLYCOL**

**Product Identification:** ETHYLENE GLYCOL

**Date of MSDS:** 01/01/1985 **Technical Review Date:** 10/18/1982

**FSC:** 6810 **NIIN:** 00-890-2091

**Submitter:** N EN

**Status Code:** C

**MFN:** 01

**Article:** N

**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** FISHER SCIENTIFIC CO.  
**Manufacturer's Address1:**  
**Manufacturer's Address2:** N/P, NK 00000  
**Manufacturer's Country:** NK  
**General Information Telephone:**  
**Emergency Telephone:** 201-796-7100  
**Emergency Telephone:** 201-796-7100  
**MSDS Preparer's Name:** N/P  
**Proprietary:** N  
**Reviewed:** Y  
**Published:** Y  
**CAGE:** 1B464  
**Special Project Code:** N

**Item Description**

**Item Name:** ETHYLENE GLYCOL, ANALYZED REAGENT  
**Item Manager:**  
**Specification Number:** NK  
**Type/Grade/Class:** NK  
**Unit of Issue:**  
**Unit of Issue Quantity:**  
**Type of Container:**

**Contractor Information**

**Contractor's Name:** FISHER SCIENTIFIC CO. CHEMICAL MFG DIV  
**Contractor's Address1:** 1 REAGENT LANE  
**Contractor's Address2:** FAIR LAWN, NJ 07410-2802  
**Contractor's Telephone:** 201-796-7100  
**Contractor's CAGE:** 1B464

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**Section 2 - Composition/Information on Ingredients**  
**ETHYLENE GLYCOL**

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**Ingredient Name:** ETHYLENE GLYCOL (SARA III)  
**Ingredient CAS Number:** 107-21-1 **Ingredient CAS Code:** M  
**RTECS Number:** KW2975000 **RTECS Code:** M  
**=WT: =WT Code:**  
**=Volume: =Volume Code:**  
**>WT: >WT Code:**  
**>Volume: >Volume Code:**  
**<WT: <WT Code:**  
**<Volume: <Volume Code:**  
**% Low WT: % Low WT Code:**  
**% High WT: % High WT Code:**  
**% Low Volume: % Low Volume Code:**  
**% High Volume: % High Volume Code:**  
**% Text:** 100

**% Environmental Weight:****Other REC Limits:** N/P**OSHA PEL:** C 50 PPM OSHA PEL Code: M**OSHA STEL:** OSHA STEL Code:**ACGIH TLV:** C 50 PPM, VAPOR; 9192 ACGIH TLV Code: M**ACGIH STEL:** N/P ACGIH STEL Code:**EPA Reporting Quantity:** 1 LB**DOT Reporting Quantity:** 1 LB**Ozone Depleting Chemical:** N

---

**Section 3 - Hazards Identification, Including Emergency Overview**  
**ETHYLENE GLYCOL**

---

**Health Hazards Acute & Chronic:** N/P**Signs & Symptoms of Overexposure:**

AVOID SKIN &amp; EYE CONTACT. PRODUCT IS IRRITANT.

**Medical Conditions Aggravated by Exposure:**

N/P

**LD50 LC50 Mixture:** N/P**Route of Entry Indicators:****Inhalation:** N/P**Skin:** N/P**Ingestion:** N/P**Carcinogenicity Indicators****NTP:** N/P**IARC:** N/P**OSHA:** N/P**Carcinogenicity Explanation:** N/P

---

**Section 4 - First Aid Measures**  
**ETHYLENE GLYCOL**

---

**First Aid:**

SKIN &amp; EYES: FLUSH W/WATER @ LEAST 15 MIN. FOR EYES, CONTACT A DR.

---

**Section 5 - Fire Fighting Measures**  
**ETHYLENE GLYCOL**

---

**Fire Fighting Procedures:**

N/P

**Unusual Fire or Explosion Hazard:**

N/P

**Extinguishing Media:**

CO\*2, DRY CHEMICAL

**Flash Point:** Flash Point Text: 240F OC

**Autoignition Temperature:**

**Autoignition Temperature Text:** N/A

**Lower Limit(s):** 3.2

**Upper Limit(s):** 15.3

---

**Section 6 - Accidental Release Measures**  
**ETHYLENE GLYCOL**

---

**Spill Release Procedures:**

ABSORB ON VERMICULITE, SCOOP UP & PLACE IN A SUITABLE CONTAINERS.

---

**Section 7 - Handling and Storage**  
**ETHYLENE GLYCOL**

---

**Handling and Storage Precautions:**

**Other Precautions:**

---

**Section 8 - Exposure Controls & Personal Protection**  
**ETHYLENE GLYCOL**

---

**Respiratory Protection:**

NONE

**Ventilation:**

LOCAL-ACCEPTABLE MECHANICAL-ACCEPTABLE

**Protective Gloves:**

RUBBER

**Eye Protection:** SAFETY GLASSES.

**Other Protective Equipment:** N/P

**Work Hygienic Practices:** N/P

**Supplemental Health & Safety Information:** VAPOR PRESSURE: <0.1 MMHG.

---

**Section 9 - Physical & Chemical Properties**  
**ETHYLENE GLYCOL**

---

**HCC:** N1

**NRC/State License Number:** N/A

**Net Property Weight for Ammo:** N/A

**Boiling Point:** Boiling Point Text: 198 C

**Melting/Freezing Point:** Melting/Freezing Text: N/A

**Decomposition Point:** Decomposition Text: N/A

**Vapor Pressure:** N/P **Vapor Density:** 2.1

**Percent Volatile Organic Content:**

**Specific Gravity:** 1.12

**Volatile Organic Content Pounds per Gallon:**

**pH:** N/P

**Volatile Organic Content Grams per Liter:**

**Viscosity:** N/P

**Evaporation Weight and Reference:** N/A  
**Solubility in Water:** COMPLETE  
**Appearance and Odor:** COLORLESS LIQUID  
**Percent Volatiles by Volume:** 0  
**Corrosion Rate:** N/P

---

**Section 10 - Stability & Reactivity Data**  
**ETHYLENE GLYCOL**

---

**Stability Indicator:** YES  
**Materials to Avoid:**  
N/P  
**Stability Condition to Avoid:**  
N/P  
**Hazardous Decomposition Products:**  
N/P  
**Hazardous Polymerization Indicator:** NO  
**Conditions to Avoid Polymerization:**  
N/P

---

**Section 11 - Toxicological Information**  
**ETHYLENE GLYCOL**

---

**Toxicological Information:**  
N/P

---

**Section 12 - Ecological Information**  
**ETHYLENE GLYCOL**

---

**Ecological Information:**  
N/P

---

**Section 13 - Disposal Considerations**  
**ETHYLENE GLYCOL**

---

**Waste Disposal Methods:**  
DISPOSE OF BY MEANS AS TO COMPLY W/ALL LOCAL, STATE & FEDERAL  
REGULATIONS, OR CONTACT AN APPROVED LICENSED DISPOSAL AGENCY.

---

**Section 14 - MSDS Transport Information**  
**ETHYLENE GLYCOL**

---

**Transport Information:**  
N/P

---

**Section 15 - Regulatory Information**  
**ETHYLENE GLYCOL**

---

**SARA Title III Information:**  
N/P  
**Federal Regulatory Information:**  
N/P

**State Regulatory Information:**

N/P

---

**Section 16 - Other Information**  
**ETHYLENE GLYCOL**

---

**Other Information:**

N/P

**HMIS Transportation Information****Product Identification:** ETHYLENE GLYCOL**Transportation ID Number:** 90332**Responsible Party CAGE:** 1B464**Date MSDS Prepared:** 01/01/1985**Date MSDS Reviewed:** 12/07/1982**MFN:** 12/07/1982**Submitter:** N TN**Status Code:** C**Container Information****Unit of Issue:****Container Quantity:****Type of Container:****Net Unit Weight:****Article without MSDS:** N**Technical Entry NOS Shipping Number:****Radioactivity:****Form:****Net Explosive Weight:****Coast Guard Ammunition Code:****Magnetism:** N/P**AF MMAC Code:****DOD Exemption Number:****Limited Quantity Indicator:****Multiple Kit Number:** 0**Kit Indicator:** N**Kit Part Indicator:** N**Review Indicator:** Y**Additional Data:**

NOT REGULATED FOR SHIPPING.

**Department of Transportation Information****DOT Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION**DOT PSN Code:** ZZZ**Symbols:** N/R**DOT PSN Modifier:****Hazard Class:** N/R**UN ID Number:** N/R**DOT Packaging Group:** N/R**Label:** N/R**Special Provision(s):** N/R

**Packaging Exception:** N/R  
**Non Bulk Packaging:** N/R  
**Bulk Packaging:** N/R  
**Maximum Quantity in Passenger Area:** N/R  
**Maximum Quantity in Cargo Area:** N/R  
**Stow in Vessel Requirements:** N/R  
**Requirements Water/Sp/Other:** N/R

#### IMO Detail Information

**IMO Proper Shipping Name:** NOT REGULATED FOR THIS MODE OF TRANSPORTATION  
**IMO PSN Code:** ZZZ  
**IMO PSN Modifier:**  
**IMDG Page Number:** N/R  
**UN Number:** N/R  
**UN Hazard Class:** N/R  
**IMO Packaging Group:** N/R  
**Subsidiary Risk Label:** N/R  
**EMS Number:** N/R  
**Medical First Aid Guide Number:** N/R

#### IATA Detail Information

**IATA Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION  
**IATA PSN Code:** ZZZ  
**IATA PSN Modifier:**  
**IATA UN Id Number:** N/R  
**IATA UN Class:** N/R  
**Subsidiary Risk Class:** N/R  
**UN Packaging Group:** N/R  
**IATA Label:** N/R  
**Packaging Note for Passengers:** N/R  
**Maximum Quantity for Passengers:** N/R  
**Packaging Note for Cargo:** N/R  
**Maximum Quantity for Cargo:** N/R  
**Exceptions:** N/R

#### AFI Detail Information

**AFI Proper Shipping Name:** NOT REGULATED BY THIS MODE OF TRANSPORTATION  
**AFI Symbols:**  
**AFI PSN Code:** ZZZ  
**AFI PSN Modifier:**  
**AFI UN Id Number:** N/R  
**AFI Hazard Class:** N/R  
**AFI Packing Group:** N/R  
**AFI Label:** N/R  
**Special Provisions:** N/A  
**Back Pack Reference:** N/A

#### HAZCOM Label Information

**Product Identification:** ETHYLENE GLYCOL  
**CAGE:** 1B464  
**Assigned Individual:** N  
**Company Name:** FISHER SCIENTIFIC CO. CHEMICAL MFG DIV  
**Company PO Box:**  
**Company Street Address1:** 1 REAGENT LANE  
**Company Street Address2:** FAIR LAWN, NJ 07410-2802 US

**Health Emergency Telephone:** 201-796-7100

**Label Required Indicator:** Y

**Date Label Reviewed:** 12/16/1998

**Status Code:** C

**Manufacturer's Label Number:**

**Date of Label:** 12/16/1998

**Year Procured:** N/K

**Organization Code:** G

**Chronic Hazard Indicator:** N/P

**Eye Protection Indicator:** N/P

**Skin Protection Indicator:** N/P

**Respiratory Protection Indicator:** N/P

**Signal Word:** N/P

**Health Hazard:**

**Contact Hazard:**

**Fire Hazard:**

**Reactivity Hazard:**

---

8/8/2002 12:54:18 AM

**ATTACHMENT C**  
**PRE-ENTRY BRIEFING ATTENDANCE SHEET**







**ATTACHMENT D**  
**ACCIDENT INVESTIGATION REPORT**



<i>(For Safety Staff only)</i>	REPORT NO.	EROC CODE	<b>UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT</b> <i>(For Use of this Form See Help Menu and USACE Suppl to AR 385-40)</i>			REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)
<b>1. ACCIDENT CLASSIFICATION</b>						
PERSONNEL CLASSIFICATION		INJURY/ILLNESS/FATAL		PROPERTY DAMAGE		MOTOR VEHICLE INVOLVED
<input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY  <input type="checkbox"/> CONTRACTOR  <input type="checkbox"/> PUBLIC		<input type="checkbox"/> FATAL <input type="checkbox"/> OTHER		<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER  <input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER		<input type="checkbox"/>   <input type="checkbox"/>
<b>2. PERSONAL DATA</b>						
a. Name (Last, First, MI)		b. AGE	c. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		d. SOCIAL SECURITY NUMBER	
f. JOB SERIES/TITLE		g. DUTY STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ON DUTY <input type="checkbox"/> TDY  <input type="checkbox"/> OFF DUTY		h. EMPLOYMENT STATUS AT TIME OF ACCIDENT <input type="checkbox"/> ARMY ACTIVE <input type="checkbox"/> ARMY RESERVE <input type="checkbox"/> VOLUNTEER <input type="checkbox"/> PERMANENT <input type="checkbox"/> FOREIGN NATIONAL <input type="checkbox"/> SEASONAL <input type="checkbox"/> TEMPORARY <input type="checkbox"/> STUDENT <input type="checkbox"/> OTHER (Specify) _____		
<b>3. GENERAL INFORMATION</b>						
a. DATE OF ACCIDENT (month/day/year)	b. TIME OF ACCIDENT (Military time) hrs	c. EXACT LOCATION OF ACCIDENT			d. CONTRACTOR'S NAME  (1) PRIME:  (2) SUBCONTRACTOR:	
e. CONTRACT NUMBER  <input type="checkbox"/> CIVIL WORKS <input type="checkbox"/> MILITARY  <input type="checkbox"/> OTHER (Specify) _____		f. TYPE OF CONTRACT <input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> SERVICE <input type="checkbox"/> A/E <input type="checkbox"/> DREDGE <input type="checkbox"/> OTHER (Specify) _____		g. HAZARDOUS/TOXIC WASTE ACTIVITY <input type="checkbox"/> SUPERFUND <input type="checkbox"/> DERP <input type="checkbox"/> IRP <input type="checkbox"/> OTHER (Specify) _____		
<b>4. CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see help menu)</b>						
a. CONSTRUCTION ACTIVITY (CODE) #				b. TYPE OF CONSTRUCTION EQUIPMENT (CODE) #		
<b>5. INJURY/ILLNESS INFORMATION (Include name on line and corresponding code number in box for items e, f &amp; g - see help menu)</b>						
a. SEVERITY OF ILLNESS/INJURY (CODE) #				b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY
e. BODY PART AFFECTED (CODE) #		g. TYPE AND SOURCE OF INJURY/ILLNESS				
PRIMARY _____ (CODE) #		TYPE _____ (CODE) #				
SECONDARY _____ (CODE) #		SOURCE _____ (CODE) #				
f. NATURE OF ILLNESS / INJURY (CODE) #						
<b>6. PUBLIC FATALITY (Fill in line and correspondence code number in box - see help menu)</b>						
a. ACTIVITY AT TIME OF ACCIDENT (CODE) #				b. PERSONAL FLOATATION DEVICE USED? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A		
<b>7. MOTOR VEHICLE ACCIDENT</b>						
a. TYPE OF VEHICLE		b. TYPE OF COLLISION			c. SEAT BELTS	
<input type="checkbox"/> PICKUP/VAN <input type="checkbox"/> AUTOMOBILE  <input type="checkbox"/> TRUCK <input type="checkbox"/> OTHER (Specify) _____		<input type="checkbox"/> SIDE SWIPE <input type="checkbox"/> HEAD ON <input type="checkbox"/> REAR END <input type="checkbox"/> BROADSIDE <input type="checkbox"/> ROLL OVER <input type="checkbox"/> BACKING <input type="checkbox"/> OTHER (Specify) _____			USED    NOT USED    NOT AVAILABLE (1) FRONT SEAT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> (2) REAR SEAT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>8. PROPERTY/MATERIAL INVOLVED</b>						
a. NAME OF ITEM		b. OWNERSHIP			c. \$ AMOUNT OF DAMAGE	
(1)						
(2)						
(3)						
<b>9. VESSEL/FLOATING PLANT ACCIDENT (Fill in line and correspondence code number in box from list - see help menu)</b>						
a. TYPE OF VESSEL/FLOATING PLANT (CODE) #				b. TYPE OF COLLISION/MISHAP (CODE) #		
<b>10. ACCIDENT DESCRIPTION (Use additional paper, if necessary)</b>						

See attached page.

<b>11. CAUSAL FACTOR(S) (Read Instruction Before Completing)</b>					
<b>a. (Explain YES answers in item 13)</b>  DESIGN: Was design of facility, workplace or equipment a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO  INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO  PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO  OPERATING PROCEDURES: Were operating procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO  JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred? <input type="checkbox"/> YES <input type="checkbox"/> NO  HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident? <input type="checkbox"/> YES <input type="checkbox"/> NO  ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO					<b>a. (CONTINUED)</b>  CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident? <input type="checkbox"/> YES <input type="checkbox"/> NO  OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO  SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task? <input type="checkbox"/> YES <input type="checkbox"/> NO  PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO  DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO  <b>b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?</b>  <input type="checkbox"/> YES (If yes, attach a copy.) <input type="checkbox"/> NO

<b>12. TRAINING</b>		
<b>a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?</b>  <input type="checkbox"/> YES <input type="checkbox"/> NO	<b>b. TYPE OF TRAINING.</b>  <input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB	<b>c. DATE OF MOST RECENT FORMAL TRAINING.</b>  (Month) (Day) (Year)

<b>13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)</b>	
<b>a. DIRECT CAUSE</b>	See attached page.
<b>b. INDIRECT CAUSE(S)</b>	See attached page.

<b>14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).</b>	
DESCRIBE FULLY:	
See attached page.	

<b>15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.</b>					
<b>a. BEGINNING (Month/Day/Year)</b>			<b>b. ANTICIPATED COMPLETION (Month/Day/Year)</b>		
<b>c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT</b>		<b>d. DATE (Mo/Da/Yr)</b>	<b>e. ORGANIZATION IDENTIFIER (Div, Br, Sect)</b>		<b>f. OFFICE SYMBOL</b>
CORPS _____					
CONTRACTOR _____					

<b>16. MANAGEMENT REVIEW (1st)</b>		
<b>a.</b> <input type="checkbox"/> CONCUR	<b>b.</b> <input type="checkbox"/> NON CONCUR	<b>c. COMMENTS</b>
SIGNATURE	TITLE	DATE

<b>17. MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)</b>		
<b>a.</b> <input type="checkbox"/> CONCUR	<b>b.</b> <input type="checkbox"/> NON CONCUR	<b>c. COMMENTS</b>
SIGNATURE	TITLE	DATE

<b>18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW</b>		
<b>a.</b> <input type="checkbox"/> CONCUR	<b>b.</b> <input type="checkbox"/> NON CONCUR	<b>c. ADDITIONAL ACTIONS/COMMENTS</b>
SIGNATURE	TITLE	DATE

<b>19. COMMAND APPROVAL</b>	
COMMENTS	
COMMANDER SIGNATURE	DATE

**10. ACCIDENT DESCRIPTION (Continuation)**

**13a. DIRECT CAUSE (Continuation)**

13b.

**INDIRECT CAUSES** *(Continuation)*

14.

**ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S)** *(Continuation)*

**FINAL**

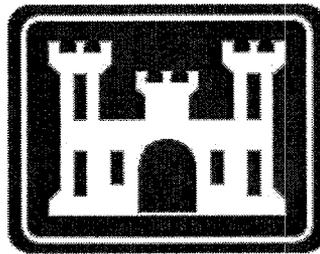
**INVESTIGATIVE-DERIVED WASTE MANAGEMENT AREA**

**CONTRACTOR'S QUALITY CONTROL PLAN**

**FORT WAINWRIGHT, ALASKA**

**DACA85-02-C-0017**

**Prepared for:**



**Department of the Army**  
**U.S. Army Engineer District, Alaska**  
**P.O. Box 6898**  
**Anchorage, Alaska 99506-6898**

**Prepared by:**

*North Wind, Inc.*  
**235 East 8<sup>th</sup> Avenue, Suite 210**  
**Anchorage, Alaska 99501**

**August 2003**



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## ABBREVIATIONS AND ACRONYMS

CO	Contracting Officer
COR	Contracting Officer Representative
CQC	Contractor Quality Control
FTW	Fort Wainwright
IDW	investigative derived waste
North Wind	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PPE	personnel protective equipment
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
USACE	U.S. Army Corps of Engineers, Alaska District
WP	Work Plan

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## 1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) has tasked North Wind, Inc. (North Wind) with conducting operation and maintenance of the Investigative-Derived Waste (IDW) Management Area at Fort Wainwright (FTW), Alaska, under contract DACA85-02-C-0017. This Contractor Quality Control (CQC) Plan has been developed for approval by the USCAE to ensure a Quality Control (QC) system is established and maintained during the period of performance of this contract. The prime contractor for this project is North Wind, Inc. (North Wind).

The CQC Plan addresses both construction QC and chemical QC issues. Construction issues are delineated in the definable features sections. Chemical QC issues include, but are not limited to; field screening, laboratory data quality objectives, and waste stream documentation. This document outlines the personnel, procedures, controls, instructions, tests, records, and forms required to maintain QC during these activities.

This CQC Plan is considered a “dynamic document” and may be modified as needed, based on the input received during the preconstruction meeting and execution of the project. No changes will be made without the approval of the USACE Contracting Officer (CO). Necessary contacts will be maintained to ensure field changes are consistent with applicable regulatory objectives.

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## 2.0 PROJECT DESCRIPTION

The activities to be conducted under this project include the operation and maintenance of the Fort Wainwright Investigative Derived Waste Management Area. The IDW Management Area was designed to receive IDW from various contractors performing environmental-related work for FTW. When a contractor generates soil or liquid IDW during an investigation, the waste is brought to the IDW Management Area for processing. The IDW Management Area has the capability to:

- ◆ Receive liquid and soil IDW;
- ◆ Treat liquid IDW;
- ◆ Characterize soil IDW; and
- ◆ Dispose of liquid and soil IDW.

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### **3.0 PROJECT ORGANIZATION**

Figure 1 outlines the organization of the management and field personnel for this project. No changes to personnel will be made without formal approval of USACE CO.

#### **3.1 PROJECT MANAGER (PM)**

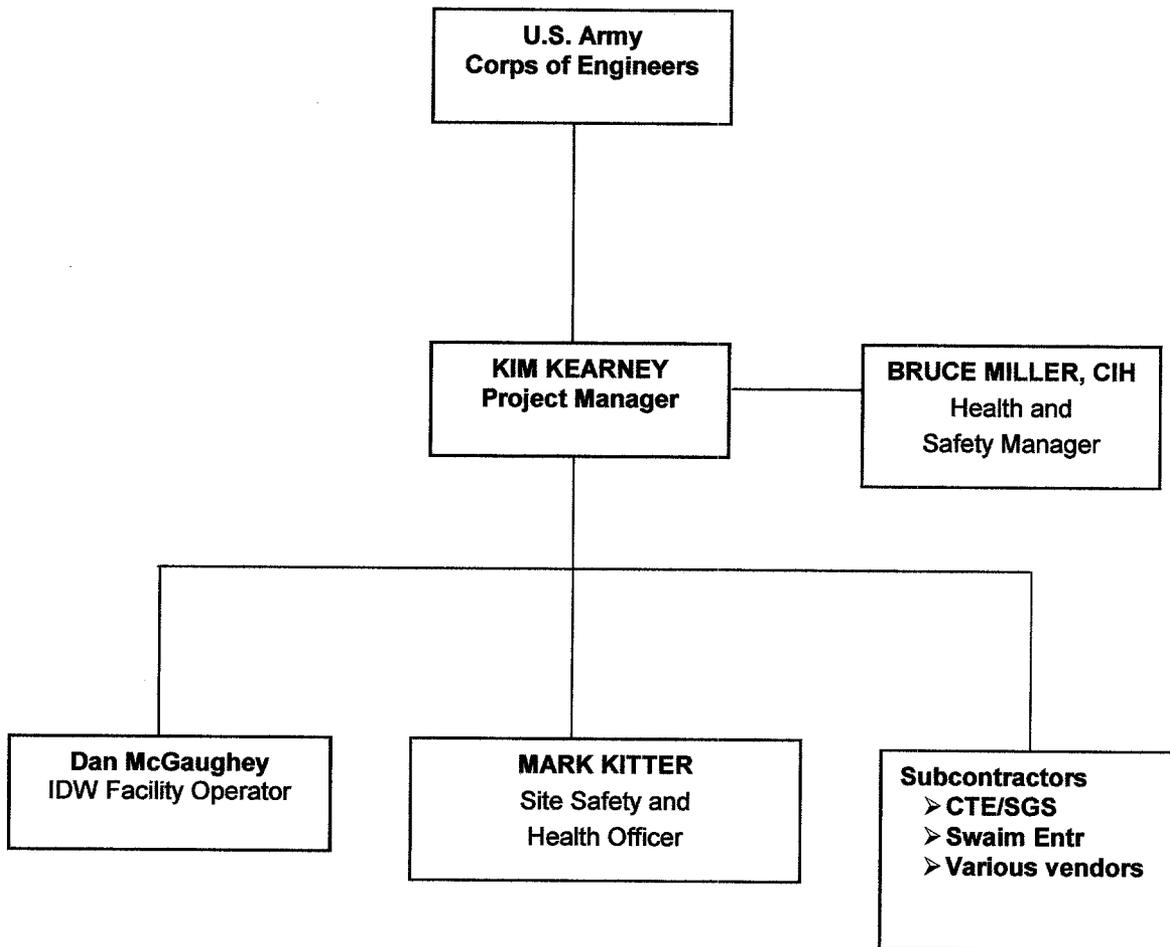
Kim Kearney will serve as the Project Manager (PM) and will be responsible for the overall technical and administrative activities. In addition, she will be responsible for ensuring the project is adequately staffed and equipped to maintain planned progress, and that all work is accomplished with a high degree of quality. She will also be ultimately responsible for project control and quality functions.

#### **3.2 IDW FACILITY OPERATOR / CQC MANAGER**

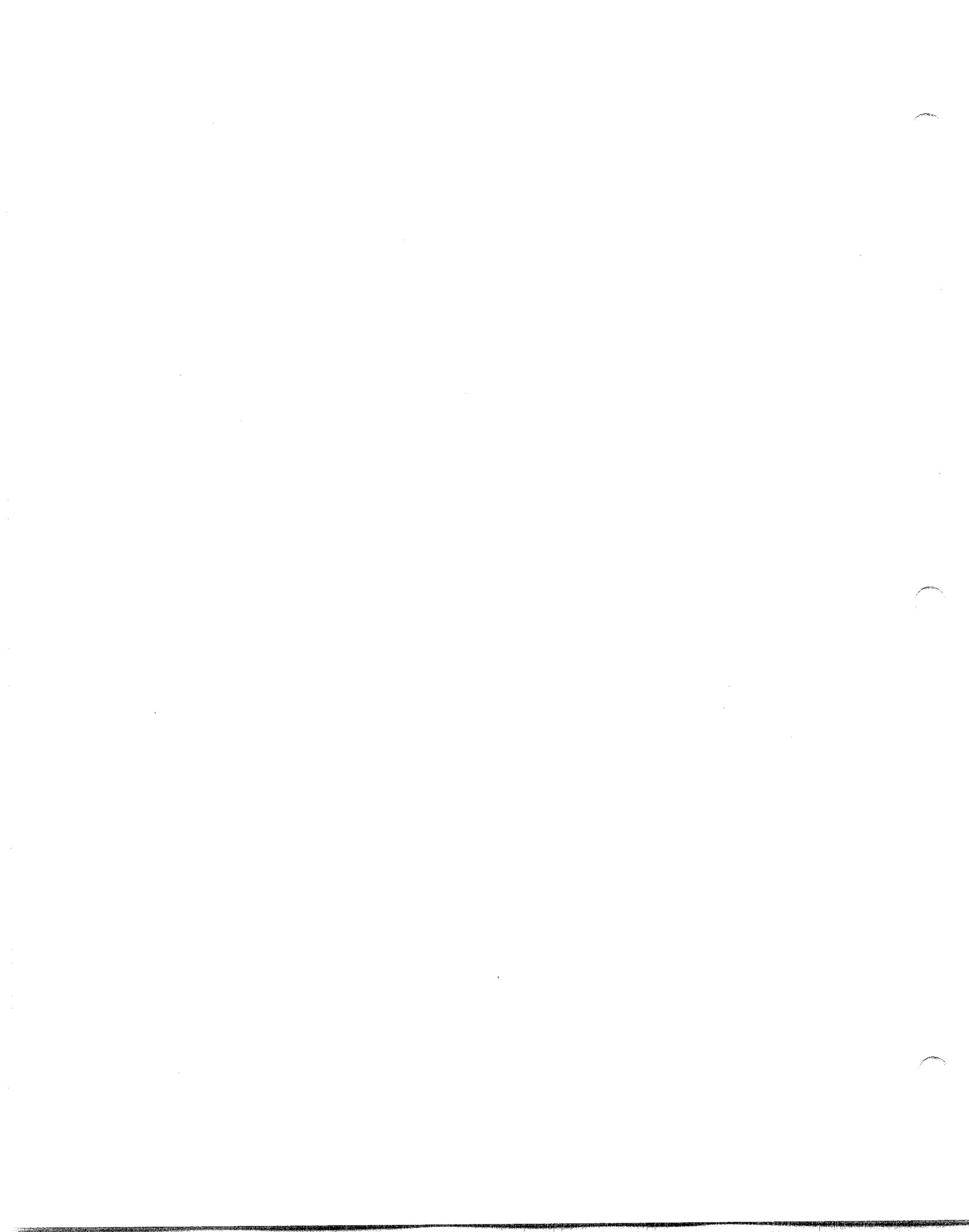
Dan McGaughey will manage the day-to-day planning and execution of the project. He will be responsible for ensuring the all personnel working at the facility are properly trained and equipped to accomplish the identified tasks. As the facility operator, he has been appropriately trained and has relevant and applicable on-site project experience. He will coordinate with the Project Manager to ensure the daily QC tasks are occurring and assist in problem resolution.

The CQC Manager is responsible for implementing this CQC Plan in support of the project which includes conducting all preparatory, initial, and follow-up meetings on definable phases of work. The CQC Manager is responsible for working with the PM to ensure that all project objectives are met. The CQC Manager will complete all required documentation in support of this project.

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**Figure 1. Project Organization**



### **3.3 SAFETY AND HEALTH MANAGER**

Bruce Miller, CIH will be responsible for the development, implementation, oversight, and enforcement of the SSHP. Mr. Miller will sign and date the SSHP prior to submittal and will be responsible for the overall health and safety portions of the contract.

### **3.4 SITE SAFETY AND HEALTH OFFICER (SSHO)**

The SSHO selected to serve on this project is Mark Kitter. Any changes to the personnel listed in this section will be pre-approved by the USACE. In addition to the duties listed below, the SSHO will oversee the activities of all personnel on-site.

The SSHO Shall:

- a. Assist and represent the Safety and Health Manager in on site training and the implementation and enforcement of the accepted SSHP.
- b. The SSHO shall have no duties other than Safety and Health-related duties.
- c. Have authority to ensure site compliance with specified safety and health requirements, Federal, State, and Occupational Safety and Health Administration (OSHA) regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of personnel protective equipment (PPE), decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containments program, and preparation of records.
- d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
- e. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the PM, and the CO.
- f. Serve as a member of the Contractor's QC staff on matters relating to safety and health.
- g. Conduct accident investigations and prepare accident reports.
- h. In coordination with facility operator and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

### 3.5 SUBCONTRACTOR MANAGEMENT

The subcontractors for this project will be SGS and Swaim Enterprises. SGS (formerly CT&E) will serve as the project analytical laboratory and Swaim Enterprises will be responsible for movement of the soil IDW, as necessary.

Subcontractors must immediately bring to the attention of the CQC Manager any activities or problems that may compromise project quality or impact the project schedule. The CQC Manager will work with the subcontractor to investigate the problem and track it through resolution. This will be tracked on the Daily CQC Report.

Subcontractors will be required to comply with all North Wind project documents, including the North Wind's Corporate Safety Manual, as well as the plans prepared for this project. CQC requirements will be incorporated by reference into project subcontracts so that compliance with North Wind's contract with the USACE is ensured. Criteria considered to be non-performance and the consequences of non-performance will be written into the subcontracts as well.

## **4.0 DOCUMENTS, RECORDS, AND SUBMITTALS**

Documents are North Wind's primary product. These may be reports written to document field activities conducted by North Wind, or by other organizations subcontracted to North Wind, documents written by North Wind in fulfillment of contract requirements, documents prepared in support of customer's needs, or proposals written to market North Wind to other organizations. Because documents are evidence of North Wind's qualifications and completion of work Activities, everything we do or claim as North Wind employees is reflected in documents we produce.

Records maintained by North Wind provide evidence of satisfactory work performance. This includes evidence that work was performed in accordance with contractual requirements, information cited in documents is accurate and factual, and that data reported to our customers is of high quality. Records also support decisions made or actions taken on our client's behalf and in fulfillment of regulatory requirements. Consequently, such records must be retained, protected, preserved, traceable to a client and/or project, and retrievable for inspection and review.

### **4.1 DOCUMENT PREPARATION, REVIEW REVISION, AND APPROVAL**

North Wind prepares documents in accordance with the needs and requirements of both internal and external customers. To ensure that these documents are of sufficient quality, they are prepared in accordance with specified requirements, reviewed to ensure all requirements are met, revised as necessary, and are approved before delivery.

#### **4.1.1 Document Preparation**

When in-process documents are originally generated, they will be assigned a unique document number by document control for tracking purposes. This number is used to identify the document throughout its lifetime and for filing purposes within the North Wind Central Files Locations.

The document is produced according to specifications in the scope of work for the project. Documents are prepared using a variety of reference materials. References must be adequately cited to allow for retrieval of the cited information, to allow for reproducibility of the decisions and/or statements made in the document, and to allow reviewers to check the cited information. Ideally, the cover page, title page, table of contents, and information cited should be copied and filed to ensure a complete record is kept of the information presented in the document.

Information (i.e., data) may also be calculated during the course of document preparation. In these instances, a calculation note provides a way of documenting the calculations performed, and provides a means for easy reviewing and verifying the calculation.

#### **4.1.2 Document Review**

Before documents are released to the customer, they must be reviewed to ensure that the previously specified requirements have been met. The level of review given to the document is dependent upon the revision status of the document (e.g., draft, final, revised) and the contractual/customer QA requirements. Several levels of review are possible, each type of review is intended to provide different assurances to the author and North Wind management. These reviews include:

- Independent Technical/Peer Review – An individual with similar expertise as the author performs the review with the intent of ensuring accurate presentation of the technical information in the document. This review also ensures that someone not technically familiar with the project can understand the information presented.
- Technical Editing and Formatting – A technical edit and format check are performed to ensure that the document is comprehensible, in the appropriate format, and does not contain spelling and/or grammatical errors.
- QA – A quality verification is completed to ensure the document meets basic requirements for quality (e.g., all necessary reviews have been performed, figure and table call-outs are included and in the proper locations, and that all supporting documentation, such as calculation notes and check print, are complete and included in the project file).

- Management – This review guarantees that the document meets the intent and fulfills contractual requirements.

Comments should be written in red ink on a hard copy of the document being reviewed and given to the author in a timely manner. The reviewer and author should discuss the comments, resolve any issues that may arise from the review and then make appropriate changes to the document. If the comments result in major changes to any statements made in the document, appropriate references should be provided by the reviewer to support the comments.

The reviewer may request to see how comments were dispositioned or incorporated into the document. USACE personnel may request or require formal disposition of comments using a comment/response form. Consequently, authors may be able to demonstrate how the comments were incorporated or provide justification for not incorporating the changes. This is easily shown using the formal comment/response form, and can be accomplished more informally by meeting with the reviewer and discussing the comments and their resolution.

## **4.2 SUBMITTALS**

The PM will be responsible for review and approval of all submittals required during this project. She will coordinate with North Wind employees, subcontractors, suppliers, and purchasing agents on the requirements and preparation of these items. She will ensure they are stamped, signed, and dated to verify that submittals comply with all work requirements. Any deviations from work requirements will be clearly identified as a variation. Reasons for deviations will be clearly indicated on the submittal. The PM will maintain all government-approved copies returned to North Wind.

Adequate time (a minimum of 30 calendar days exclusive of mailing time) will be allowed and shown on the register for review and approval.

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## **5.0 TESTING PROCEDURES FOR CONTROL, VERIFICATION, AND ACCEPTANCE**

At this time no testing is required of materials for control, verification, or acceptance. Procedures for environmental sampling and analysis are included in the Section 4.0 of the IDW Management Area Work Plan.

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## **6.0 CORRECTIVE ACTION FOR PROJECT DEFICIENCIES**

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, or errors are promptly investigated, documented, evaluated, and corrected.

When a significant condition adverse to quality is noted, the cause of the condition will be determined and corrective action taken immediately. All project personnel have the responsibility, as part of routine work duties, to promptly identify, solicit approved corrections, and report conditions adverse to quality. Such significant conditions shall be brought to the attention of the Contracting Officer's Representative (COR) at once.

The need for corrective action will be identified as a result of field audits and problems that may arise during performance of this project. Two types of audit procedures will be used to assess and document performance and project staff: system audits and performance audits. These audits will be performed at frequent intervals under the direction of designated CQC personnel to quantitatively evaluate the accuracy of the total measurement system. These audits form the basis for corrective action requirements and provide a permanent record of the conformance of measurement systems to QA requirements. If problems become apparent that are identified as originating in the field, immediate corrective action will take place. If immediate corrective action does not resolve the problem, appropriate personnel will be assigned to further investigate and evaluate the cause of the problem. When a corrective action is implemented, the effectiveness of the action will be verified so that the end result is elimination of the problem.

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## **7.0 CUSTOMER COMPLAINT SYSTEM**

This section prescribes the basic procedures and responsibilities of North Wind's Customer Complaint System. The term complaint refers to any type of report that reflects on the quality of products issued, stored, or services rendered to North Wind's customers or clients.

The on-site Facility Operator and/or the PM is responsible for receipt and initial management of all customer complaints. Depending on the type of complaint, where it is initiated, and who initiated it will determine whether the PM or the Facility Operator will be responsible for complaint resolution. All complaints received will be entered into a complaint database established for this contract. Once the complaint has been validated, the basis of the complaint will be investigated and generator of the complaint maybe queried to gain additional insight into the basis of the complaint.

The PM is responsible for resolution of all complaints received to the customer's satisfaction. Once the PM has gained a full understanding of the complaint and its basis, she will evoke the appropriate corrective action to rectify the situation generating the complaint, and will provide feedback to the customer in writing.

Should a situation arise, where the corrective action taken by North Wind in response to a received complaint does not resolve the situation generating the complaint to the customer's satisfaction, the North Wind PM will immediately notify the COR.

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## **8.0 DEFINABLE FEATURES OF WORK**

All definable features of work will be monitored and inspected to ensure they are completed in accordance with the specifications and all applicable regulations. Definable features of work for this project include:

- Equipment inspections;
- Soil IDW management and disposal;
- Confirmation and characterization sampling;
- Drum collection and processing;
- Contaminated water treatment and disposal;
- Equipment and tool decontamination; and
- Liquid/sludge/residue treatment, packaging, and disposal.

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## 9.0 DOCUMENT CONTROL PROCEDURES

Documents must be kept in an orderly system to archive important project information and easily access past project information. Project documents, should be marked with the project name, an North Wind internal project number, date, and contract number.

Project documents shall be filed in a central file in the North Wind office located at 235 East 8<sup>th</sup> Avenue, Anchorage, Alaska 99501. Field records, such as copies of daily reports and training records will be on file in North Wind's field office located at Building 3489 on Fort Wainwright. Project documents shall be filed under the North Wind internal job number. As needed, subtasks under the job number may also be established. Files will be divided into the following categories:

- Billing folder;
- Contract;
- Correspondence;
- Deliverables;
- Safety and health data;
- Field data;
- Lab data;
- Subcontractors and suppliers; and
- Reference material.

Each project document will have a route slip. Project personnel will complete and initial the route slip. The route slip shows the job number, document date, and the folder the document should be filed in. The PM will review and initial all documents before filing. The PM will ensure documents are filed at least once per week. Files will be kept for at least three years from the end of the project or longer depending upon regulatory requirements.

