# FILE COTY

Olin Defense Environmental Engineering Badger Army Ammunition Plant Baraboo, WI 53913

Report DRATH-FS

BADGER ARMY AMMULITION PLANT CONTAMINATION SURVEY

ENVIRODYNE ENGINEERS, INC. 12161 Lackland Road St Louis: Missouri 63141

#### March 1981

#### FINAL REPORT

Distribution limited to U.S. Government Agencies only for protection of privileged information. Other requests for the document must be referred to: Commander, Badger Army Ammunition Plant, Baraboo, Wisconsin 53913

Prepared For:

Badger Army Ammunition Plant Baraboo, Wisconsin 53913

Commander U.S. Army Toxic & Hazardous Materials Agency Aberdeen Proving Ground, Maryland 21010 SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS		
REPORT DUCUMENTATION		BEFORE COMPLETING FORM		
	2. GOVT ACCESSION	NO. 3. RECIPIENT'S CATALOG NUMBER		
DRXTH-FS				
TITLE (and Sublitle)		5. TYPE OF REPORT & PERIOD COVERED		
Badger Army Ammunition Plant Envir	conmental Surv	ey Final Report		
		6. PERFORMING ORG. REPORT NUMBER		
		6. PERFORMING ORG. REPORT NUMBER		
7. AUTHOR(+)		8. CONTRACT OR GRANT NUMBER(.)		
9. PERFORMING ORGANIZATION NAME AND ADDRESS Envirodyne Engineers Inc.		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS		
12161 Lackland Road				
St. Louis, Missouri 63141				
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE		
Commander's Representative		January 1981		
Badger Army Ammunition Plant		13. NUMBER OF PAGES		
Baraboo, Wisconsin 53913 14. MONITORING AGENCY NAME & ADDRESS(II dilloren				
14. MONITORING AGENCY NAME & ADDRESS(II dilloron	t from Controlling Offic	ce) 15. SECURITY CLASS. (of this report)		
US Army Toxic & Hazardous Material	<b>U</b>			
Aberdeen Proving Ground, MD 21010	)	Unclassified 15e. DECLASSIFICATION/DOWNGRADING		
		SCHEDULE		
16. DISTRIBUTION STATEMENT (of this Report)				
Distribution limited to US Governm	nent Agencies of	only for protection of		
privileged information evaluating		-		
document must be referred to: Com	-	esentative, Badger Army		
Ammunition Plant, Baraboo, WI 539	913			
17. DISTRIBUTION STATEMENT (of the abstract entered	in Block 20, if differen	it from Report)		
N/A				
18. SUPPLEMENTARY NOTES				
N/A				
19. KEY WORDS (Continue on reverse side if necessary and Environmental Biota GC/		· ·		
• · · ·	tling Analy	1		
Groundwater Metals Pon	÷ .			
Soils Propellants Bay		trotoluene		
Sediments GC/MS Wat	er 📜 Dietl	hylphthalate		
20. ADSTRACT (Continue an reverse side it necessary and	d identify by block num	ber)		
From September 1979 through Octobe				
Badger Army Ammunition Plant, Baraboo, Wisconsin was conducted. The survey consisted of installing monitoring wells, collecting samples of groundwater,				
I consisted of installing monitoring	vollo	sting complex of anousting		
surface water, soils, sediments, a	nd biota and a	analyzing them for suspected		
surface water, soils, sediments, a chemical contaminants. The report	nd biota and a covers all p	analyzing them for suspected rocedures employed for instal-		
surface water, soils, sediments, a	nd biota and a covers all p	analyzing them for suspected rocedures employed for instal-		

## TABLE OF CONTENTS

۰.

		Page No.
Report Docum Table of Con List of Tabl List of Figu	es	i ii v viii
Executive Su	mmary	x
Chapter No.		
1	INTRODUCTION	1
2	DATA MANAGEMENT	3
	Introduction Data Capture Data Files	3 3 5
3	GEOTECHNICAL SUMMARY	8
	Regional Geologic Setting Subsoils Bedrock Deposits Groundwater Flow Potential Contaminant Migration Settling Basins	8 11 25 26 31 34
	Problems Encountered During Subsurface Investigation	37
4	SAMPLING	39
	Potential Sources of Contamination Surface Soils and Drainageway Sampling Settling Pond Sediment Sampling Groundwater Sampling	39 43 46 51
5	CHEMICAL ANALYSIS	58
	Analytical Methodology Quality Assurance/Quality Control	58 62

## TABLE OF CONTENTS

Chapter No.			Page No.
6	GRUBERS GROV	E BAY	71
	Water Samplin Sediment Samp Fish Sampling Chemical Ana Data Interpro Macroinverte Summary	pling g lysis etation	72 76 80 83 83 88 102
7	INTERPRETATIO	ON OF THE SURVEY DATA	106
		on of Screening Phase Data on of Verification Phase Data ussion	106 113 129
8	CONCLUSIONS		131
	Ballistics Pe Oleum Plant Oleum Pond Sanitary Land Deterrent Bur Nitroglycerin Burning Group Rocket/Paste Wastewater Tr Settling Pond	dfill rning Area n Pond nds Area reatment Plant	131 131 134 134 135 135 136 136 136 137 137
	APPENDIX A:	IR DATA CODE ADDITIONS OR CHANGES	
	APPENDIX B:	COMPOSITE SAMPLE NUMBERS	
	APPENDIX C:	IR SAMPLING AND ANALYSIS GEOTECHNICAL - MAP FILE	
	APPENDIX D:	IR SAMPLING AND ANALYSIS ECOLOGICAL SURVEY - MONITORING PROGRAM	
	APPENDIX E:	IR SAMPLING AND ANALYSIS GEOTECHNICAL - FIELD DRILLING	

.

### TABLE OF CONTENTS (Continued)

Chapter No.

#### Page No.

- APPENDIX F: IR SAMPLING AND ANALYSIS GEOTECHNICAL - PHYSICAL ANALYSIS
- APPENDIX G: PRELIMINARY ENVIRONMENTAL SURVEY, BADGER ARMY AMMUNITION PLANT, BARABOO, WISCONSIN (WARZYN ENGINEERING, INC.)

nesser D

- APPENDIX H: TERRESTRIAL VEGETATION SAMPLING
- APPENDIX I: ANALYTICAL RESULTS
- APPENDIX J: ANALYTICAL METHODS
- APPENDIX K: GC/MS RESULTS

## LIST OF TABLES

Table No.		Page No.
2-1	BAAP Sample and Site Numbering System	4
3-1	Loess Deposits	18
3-2	Clean Outwash Sand	19
3-3	Stratified Outwash	21
3-4	Gravel Outwash	20
3-5	Summary of Baildown Permeability Testing	23
3-6	Sandy Till/Clayey Till	24
3-7	Summary of Monitoring Well Data	28
3-8	Surface Water Elevations of Ponds at BAAP	30
3-9	Groundwater Flow Velocities	32
4-1	Potential Sources of Contamination	45
4-2	Settling Pond Sediment Thicknesses	50
4-3	Amount of Water Purged from Wells	52
4-4	Control Samples	54
5-1	Analytical Methodology	59
5-2	Summary of Detection Limits in Deionized Water	63
5-3	Summary of Detection Limits in Soil	64
5-4	Precision and Accuracy in Water and Soil	66
5-5	Results of Duplicate Analyses - Metals	67
5-6	Results of Duplicate Analyses - Organics and Non-Metals	68
5-7	Results of Spiked Sample Analyses	69

v

## LIST OF TABLES (Continued)

ł

Table No.		Page No.
6-1	Sediment Sample Key	78
6-2	Fish Collection	82
6-3	Analyses Performed on Sediment, Water and Fish Samples	84
6-4	Summary of Positive GC/MS Results: Gruber: Grove Bay and Wiegands Bay	s 85
6-5	Summary of Positive Analytical Results by Site ID: S1300 Series - Soil Sediment	87
6-6	Field Data From Biological Collection	92
6-7	Benthic Macroinvertebrate Organisms Collected at Ten Sampling Points in Lake Wisconsin	93
6-8	Number of Species from Each Sampling Station and Their Classification Based on Tolerance to Organic Pollution	98
6-9	Mann-Whitney U-Test Statistics for the Null Hypothesis (H <sub>O</sub> ) of No Difference in the Population in Grubers Grove Bay and Wiegands Bay	99
7-1	Summary of Verification Samples	114
7-2	Parameters Analyzed in Surface Soils	115
7-3	Parameters Analyzed in Settling Pond Sediments	116
7-4	Analyses Performed on Groundwater Samples	117
7-5	Parameters Found Not to be of Concern at BAAP	119
7-6	Summary of Positive Analytical Results: Wells (Sll00 Series)	120

## LIST OF TABLES (Continued)

. .

.

Table No.		Page No.
	Summary of Positive Analytical Results: Settling Ponds (S1200 Series)	121
	Summary of Positive Analytical Results: Surface Soils/Drainageways (S1400 Series)	122
	Summary of GC/MS Results: Wells (Sll00 Series)	123
7-10	Summary of GC/MS Results: Settling Ponds (S1200 Series)	124
	Summary of GC/MS Results: Surface Soils/ Drainageways (S1400 Series)	125
	Limiting Concentrations for Listing Samples on Tables 7-6 through 7-8	126
8-1	Groundwater Flow Velocities	132

## LIST OF FIGURES

Figure No.		Page No.
3-1	Regional Geology	9
3-2	Cross-Section Locations	12
3-3	Geologic Cross-Sections A-A' and B-B'	13
3-4	Geologic Cross-Sections C-C' and D-D'	14
3-5	Geologic Cross-Sections E-E' and F-F'	15
3-6	Geologic Cross-Sections G-G' and H-H'	16
<b>3</b> -7	Water Table Map	27
3-8	Groundwater Flow Velocities	33
3-9	Boring Locations - Settling Basins	35
3-10	Settling Basins Cross-Section	36
4-1	Potential Sources of Contamination and Major Drainageways	40
4-2	Surface Soil/Drainageway Sampling Sites	44
4-3	Shelby Tube Sampler	47
4-4	Boring Locations - Settling Basins	49
4-5	Site Topography and Well Locations	51a
6-1	Sediment/Water Sampling Point Locations: Wiegands Bay, Lake Wisconsin and the Wisconsin River	73
6-2	Sediment/Water Sampling Points: Grubers Grove Bay	74
6-3	Surface Water Sampling System	75
6-4	Ekman Dredge	77
6-5	Osterberg Piston Sampler	79
6-6	Recent Sediment Thickness, Grubers Grove Bay	81

viii

## LIST OF FIGURES (Continued)

Figure No.		Page No.
6-7	Location of Benthic Sampling Sites in Grubers Grove Bay	90
6-8	Location of Benthic Sampling Sites in Wiegands Bay	91
6-9	Relative Percent Composition of the Benthic Macroinvertebrate Fauna of Grubers Grove Bay	95
6-10	Relative Percent Composition of the Benthic Macroinvertebrate Fauna of Wiegands Bay	97
7-1	Potential Sources of Contamination and Major Drainageways	107
8-1	Groundwater Flow Velocities	133
H-1	Vegetation Sampling Areas	
H-2	Vegetation Sampling Sites	

.

#### EXECUTIVE SUMMARY

From September 1979 through October 1980, Envirodyne Engineers, Inc. (EEI) conducted a preliminary contamination survey of the Badger Army Ammunition Plant (BAAP) in Baraboo, Wisconsin. The survey consisted of a geotechnical investigation and sampling and analysis program. Part of the geotechnical investigation included the installation of 33 groundwater monitoring wells and hydraulic testing of those wells. The sampling program included the collection of groundwater, surface water, sediment, surface soil and biological samples. These samples were analyzed by a variety of techniques including atomic absorption spectrophotometry (AAS), automated colorimetric analysis, gas chromatography with electron capture detection (GC/EC), and gas chromatography/mass spectrometry (GS/MS).

The purpose of the survey was to determine whether contaminants are migrating across the boundaries of BAAP and, if not, to determine the potential for contaminants to migrate in the future. Based on the survey results, it appears that no contaminants are presently migrating off site. Some contaminants (most notably nitrocellulose) have migrated off BAAP property in the past and are still present in high (though not necessarily harmful) concentrations in the sediments of Grubers Grove Bay of Lake Wisconsin. The nitrocellulose has apparently been decomposing to form ammonia, which is also present in high concentrations in the sediments.

Some contamination of the groundwater at BAAP appears to have resulted from operations at both the burning grounds and the sanitary landfill. The contaminated groundwater in the vicinity of the landfill is very close to the boundary of BAAP and is moving toward that boundary. The groundwater contamination in the vicinity of the burning grounds (chloroform and carbon tetrachloride) has apparently migrated at least 100 feet. Groundwater movement is slow in the vicinity of the burning grounds (1 to 3 feet per year). Between the burning grounds and the boundary of BAAP (in the direction of flow), groundwater movement ranges between 1 and 68 feet per year. The distance from the burning grounds to the BAAP boundary along the projected groundwater flow path is at least 1 mile.

х

#### CHAPTER 1

#### INTRODUCTION AND PURPOSE OF THE SURVEY

From September 1979 through October 1980, Envirodyne Engineers, Inc. (EEI) and its subcontractor, Warzyn Engineering, Inc., conducted a preliminary contamination survey of the Badger Army Ammunition Plant (BAAP) located near Baraboo, Wisconsin. BAAP is presently in "standby" status and is maintained by the Olin Corporation under contract with the U. S. Army. The contamination survey performed by EEI was conducted under Contract No. DAAK11-79-C-0117, issued by ARRADCOM and executed by ARRCOM Rock Island, Illinois. The contract was monitored technically by the U. S. Army Toxic and Hazardous Materials Agency (USATHAMA).

The primary objective of the survey was to determine whether contaminants are migrating outside the boundaries of BAAP and, if not, to determine the potential for migration. There were two secondary objectives. One was to answer some of the environmental questions that had been raised about the proposed dredging of Grubers Grove Bay, the receiving body for BAAP's wastewater discharge. The other secondary objective was to test the feasibility of tracing groundwater contamination through infrared photography of the vegetation.

This survey has successfully achieved the primary and the first of the two secondary objectives through a combination of geotechnical/hydrological analysis, water, biota, soil and sediment sampling, and chemical analysis of the samples. Correlation of groundwater contamination with vegetative stress could not be achieved because of the lack of significant widespread groundwater contamination and the great depth to the water table encountered over most of BAAP.

The drilling and installation of monitoring wells and the collection of deep soil and sediment samples were performed by EEI's subcontractor, Warzyn Engineering, Inc. located in Madison, Wisconsin. Warzyn subcontracted most of the actual well drilling to Ace Well Drilling, Wisconsin Dells, Wisconsin. Warzyn also performed most of the geotechnical analysis, and their report to EEI is included as Appendix G to this report.

EEI personnel conducted all water, biota, and surface soil sampling and supervised sediment sampling. All chemical analyses were performed by EEI. The USATHAMA Quality Assurance Program was used to establish detection limits for each analytical method utilized and to establish the precision and accuracy of quantitative data.

1

The BAAP survey was conducted in two phases: an initial qualitative screening phase followed by a quantitative verification phase. The screening phase was conducted to determine the presence or absence of contamination at and in the vicinity of certain suspected sources of contamination as well as to identify any previously unsuspected contaminants which might occur in these areas. The verification phase documented and quantified the concentrations of contaminants detected during the screening phase and determined if (or at what rate and direction) these contaminants are migrating.

Chapter 2 outlines the organization, management, storage and reporting of the vast amounts of data that were generated as part of this study. Chapter 3 contains a geotechnical summary. Portions of this summary were written by Warzyn, and these are included in their geotechnical report (Appendix G).

Chapter 4 contains a description of the potential sources of contamination that were previously identified at BAAP. It also includes sampling site locations and a detailed discussion of the sampling materials and methods employed. Chapter 5 outlines the analytical methods used, the problems that arose in using those methods, and the quality assurance program employed during the survey. In Chapter 6, the investigations conducted off-site in Grubers Grove Bay, Wiegands Bay, Lake Wisconsin and the Wisconsin River are discussed. This discussion includes sections on sampling, analysis, interpretation, and a summary of the results of the study.

In Chapter 7 the analytical results of the rest of the survey are summarized and interpreted with regard to the physical environment at BAAP. In Chapter 8 this summary is used to draw conclusions regarding the occurrence and migration of contaminants at BAAP.

## CHAPTER 2 DATA MANAGEMENT

#### INTRODUCTION

During the environmental survey of BAAP, data was generated from field sampling, surveying, well installations, and chemical and physical analyses. Each piece of data has been recorded and formatted into one of the five existing IR Data Management System files, as specified in the BAAP Data Management Plan (1). These five files are listed below:

- 1) Geotechnical Map File
- 2) Geotechnical Field Drilling
- 3) Geotechnical Physical Analysis
- 4) Chemical Analyses
- 5) Ecological Survey Monitoring Program

The majority of the data is contained in the two analysis files; field survey results in the other three files represent a smaller portion of the total record.

#### DATA CAPTURE

Most of the data files have new entry codes which are not found in the IR Data Management User's Guide (2). New code names are proposed for those variables where code names do not currently exist. Examples include new genus/species codes for the Ecological Survey - Monitoring Program file, site types in the map file, and test names in the Chemical Analysis file. Appendix A includes a complete listing of the proposed code names.

The numbering system for sample numbers and site identifications (ID) includes alphabetic and numeric prefixes and sequences designed to show (generally) the location and type of sample referenced. The result or analysis indicates by itself the general site and sample type. Table 2-1 presents a more

## TABLE 2-1 BAAP SAMPLE AND SITE NUMBERING SYSTEM

Site ID Numbering	Generalized Site Type	
S0001-S0999	Biological sampling locations	
S1100-S1199	Well	
S1200-S1299	Settling ponds	
S1300-S1399	Bays, rivers, lakes	
S1400-S1499	Surface soils	

Sample Number Prefixes	Generalized Sample Type
AXXXX <sup>(a)</sup>	Groundwater
WXXXX	Surface water
DXXXX	Soil or parent material
MXXXX	Sediment (deposited material)

NOTES:

(a) Where X is numeric field of four digits.

detailed explanation of the system. Data from all of the files is related to the "Site ID" field, a unique location at BAAP. Thus, different types of samples obtained at the same location are readily identified and linked together by referencing the Site ID.

Quality control for data capture phases insured the accuracy of data entered onto magnetic tape from the coding forms. Inspection by attributes, as outlined in Military Standard 105D (3), was the procedure used. Inspection Level II was utilized in a multiple sampling plan designed to insure that the percent defective did not exceed 0.25 percent (AQL = 0.25). The unit of product was one record. All defects discovered were corrected and rejected batches were subjected to further manual inspection. All batches passed this quality control test before they were accepted.

Composite sample numbers were established for certain physical and chemical analyses pertaining to sediment and soil samples. The need for composited samples arises, for example, when numerous individual soil or sediment horizons are obtained at one site but only require a composited analysis for a particular Thus, composite samples and sample numbers were parameter. generated during initial sample log-in (or later when needed). Appendix B contains all composite sample numbers and associated individual sample numbers used for analysis during the survey. A character "C" in column 47 of the Chemical Analysis file denotes a composite sample. The characters "L", "U" and "S" in column 47 denote lower, upper and sediment horizons, respec-These were used for defining a separate horizon sample tively. from sample containers which were originally logged-in as one sample number in several containers and originally scheduled for composite analysis. Composite sample numbers in the Geotechnical Physical Analysis file are identified by the character "C" in column 27. Likewise, existing samples were composited for physical analysis when needed.

#### DATA FILES

The map file contains the coordinates of each site ID used at BAAP. The site IDs have grid coordinates. The site IDs for wells and settling ponds are coded with coordinates in the state planar. All other site IDs are in meters, representing the east and north distances from a point of origin located south and west of the physical plant. This origin has the following Universal Transverse Mercator (UTM) coordinates: east: 275000 north: 4798500

Thus, UTM coordinates can ultimately be determined for those site IDs in meters by adding them to the origin point (in UTM). Appendix C contains a sample map file and code name explanations as well as a table explaining the "description" field for biology site IDs from S0001 to S0037. These further define the exact locations for terrestrial biological sampling points.

The Ecological Survey - Monitoring Program file contains aquatic and terrestrial survey data collected at BAAP. Site IDs (columns 20-29) for this file were originally assigned to numbers ranging between S0001 and S0999. In reality, however, the site IDs ranged from S0001 to less than S0060. Sample numbers for terrestrial samples fall within the range of B0001 through B0199 and aquatic biology samples range from B0200 through B9999 (Appendix D). In most cases, numerous samples were obtained at one site ID, and these can be keyed to the map file for exact locations.

The <u>Geotechnical - Field Drilling</u> file contains data related to well drilling, construction, and well testing at BAAP. Appendix E reveals the file format. Site IDs for the wells range between S1100 to S1199. Again, these are keyed to the map file for exact well locations.

Physical analyses were performed on only two site types, wells and river sediments. These results are contained in the Geotechnical - Physical Analysis file. Variables for this file, along with the format, are presented in Appendix F.

Results of chemical analyses are contained in the Chemical Analysis file (with the exception of GC/MS scans). Variables used in the file, such as test names and measurement units, were obtained from the most recent IR Data Management Guide, Series "B", changes and updates. For ease of data handling and field surveying, an abridged chemical analysis coding form was created and is included in the Appendix. Data from this field form was entered onto a scratch file containing information related to obtaining samples in the field. Laboratory personnel entered chemical results on the regular form containing analysis data (columns 35-80). This portion was also punched onto a scratch file. Using the sample number as the key between these two scratch files, a computer program then combined related data to create a complete Chemical Analysis file.



#### LIST OF REFERENCES FOR CHAPTER 2

- (1) Envirodyne Engineers, Inc., 1979. Data Management Plan for Badger Army Ammunition Plant, Contract No. DAAK11-79-C-0117, U. S. Army, Aberdeen Proving Ground (Edgewood Area), Maryland.
- (2) U. S. Army, 1978. Installation Restoration (IR) Data Management User's Guide, Chemical Systems Laboratory, Aberdeen Proving Ground, Maryland.
- ( 3) U. S. Department of Defense, 1963. <u>Sampling Procedures</u> and Tables for Inspection by Attributes, MIL-STD-105D, Washington, DC: USGPO.

#### CHAPTER 3

### GEOTECHNICAL SUMMARY

This chapter was taken from the Warzyn Engineering, Inc. report, which is included in its entirety as Appendix G.

#### REGIONAL GEOLOGIC SETTING

#### Glacial Geology

The following discussion of regional geology is primarily based on "Geology of the Baraboo District, Wisconsin," Wisconsin Geological and Natural History Survey Information Circular 14, 1970.

The surface morphology of the BAAP is basically the result of late Wisconsin Stage Glaciation. The terminus of the last major ice advance is situated in the west-central area of the site (see Figure 3-1). The eastern two-thirds of the site were under the direct influence of glacial ice, giving rise to an undulating topography characterized by knob and kettle type features. Several on-site kettle holes are currently occupied by small ponds. Due to differential melting of the ice front, the glacial deposits in the eastern areas are combined stratified outwash deposits and glacial till.

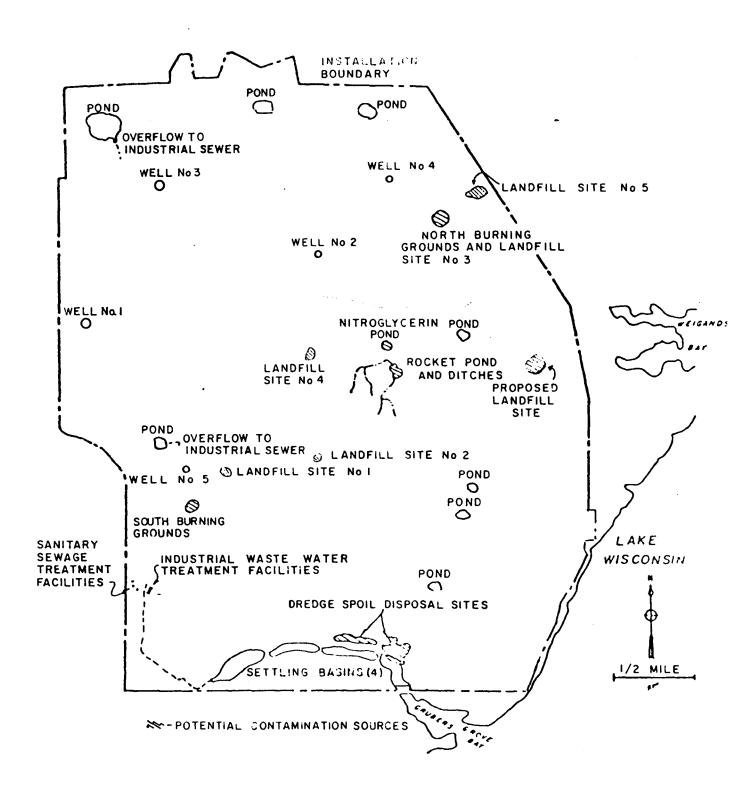
The western third of the site was not overlain by glacial ice and forms a flat glacial outwash plain. The plain is underlain by stratified sand and gravel with some minor silt or clay layers. The plain extends south of the plant area where it becomes part of the Wisconsin River Valley. The area east of the plant, on the eastern bank of Lake Wisconsin, is characterized by undifferentiated glacial till, lake and wind deposits, and recent river deposits. The northern boundary of the BAAP lies along the southern edge of the Baraboo hills. The hills reach elevations of over 1,400 feet north of the plant boundaries near Devil's Lake. Within BAAP boundaries, the highest bedrock elevation is approximately 1,140 feet above sea level near the water reservoirs upslope from the water treatment plant, along the northern site boundary.

#### Bedrock Geology

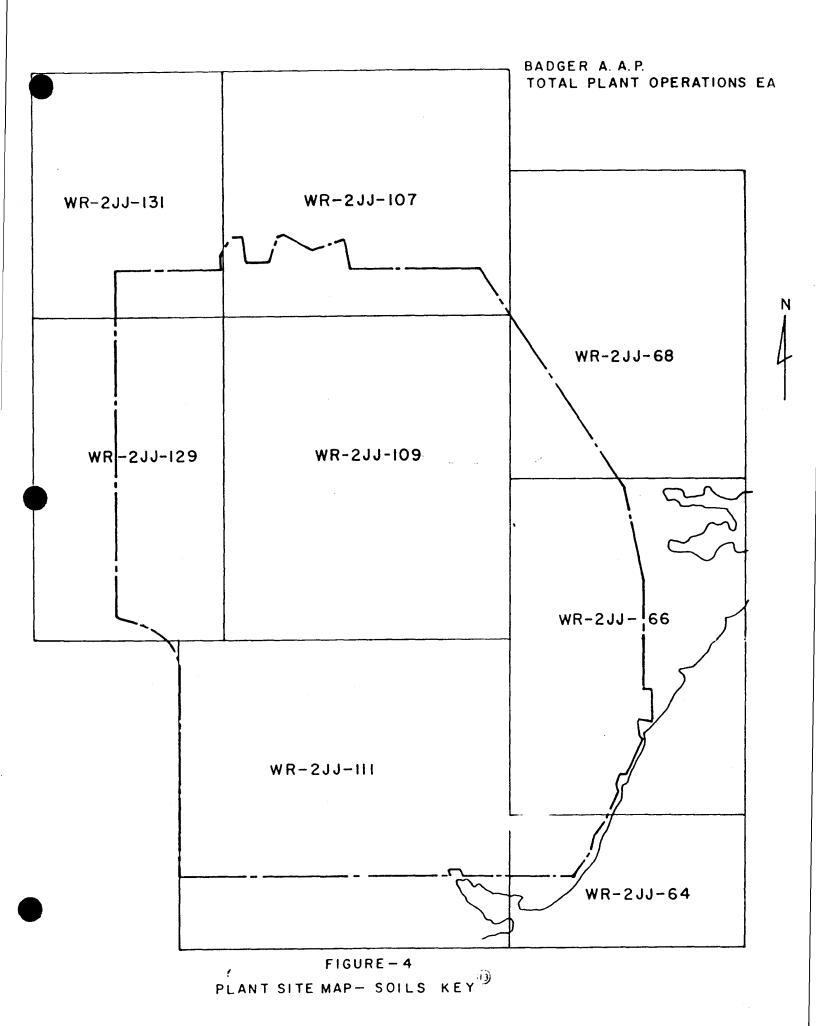
The bedrock around BAAP is characterized by Precambrian metamorphic rock and upper Cambrian to Ordovician sandstones, shales and dolomites (see Figure 3-1). The oldest rock unit which

#### BADGER A. A. P. TOTAL PLANT OPERATIONS EA

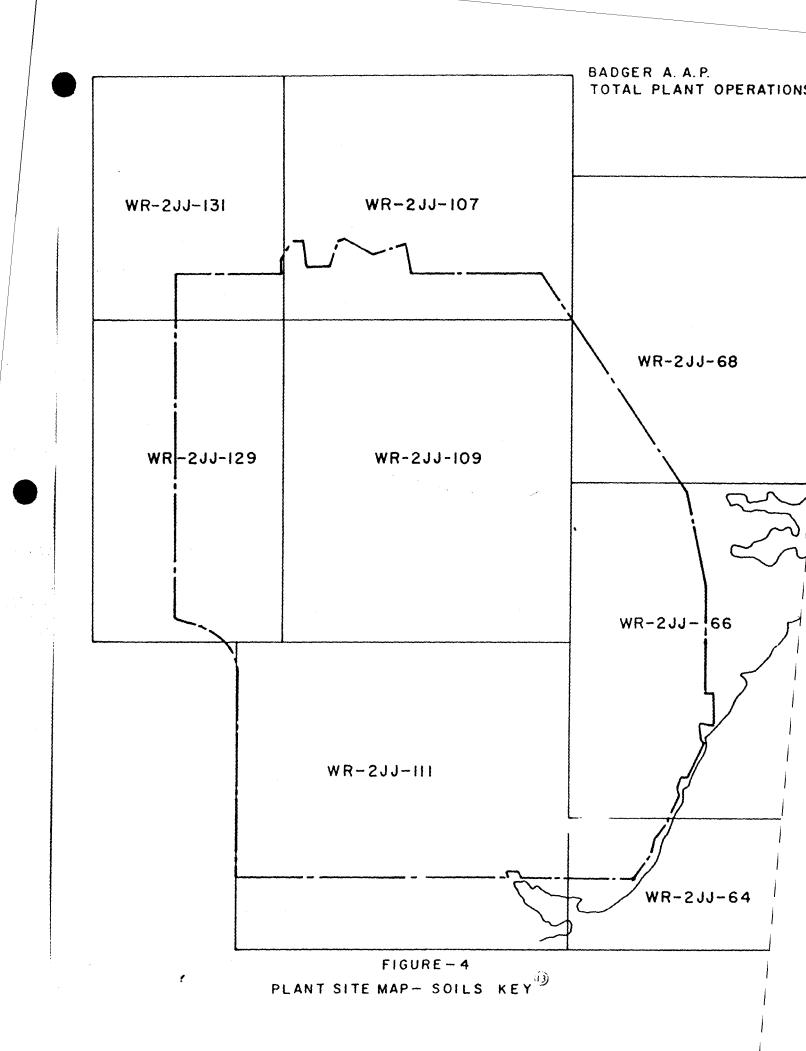


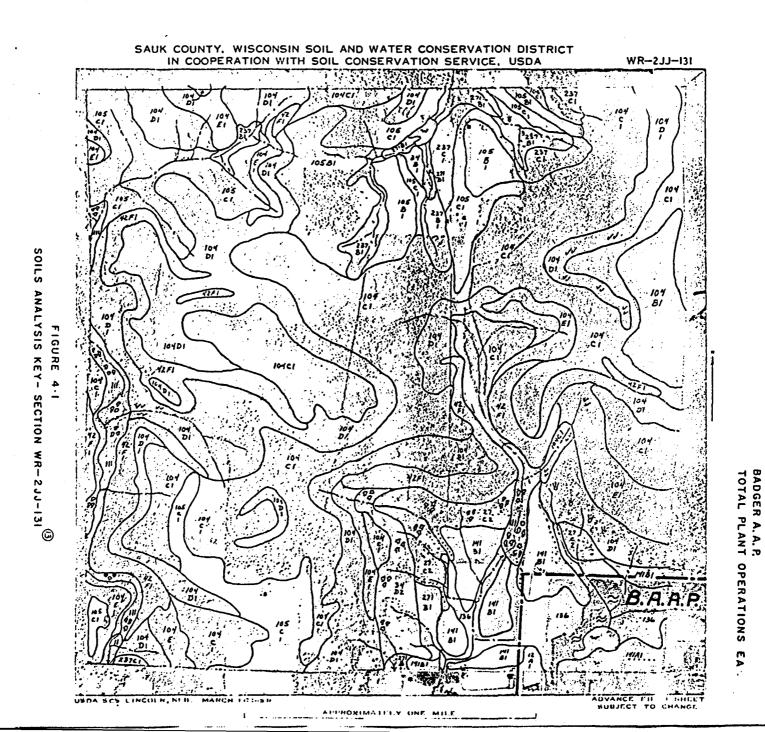


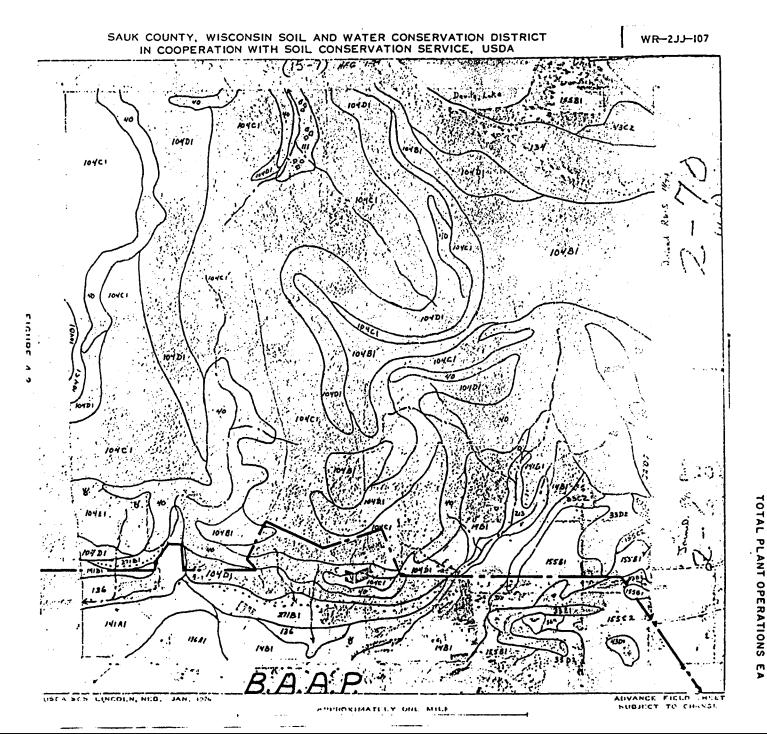
1



A prime and

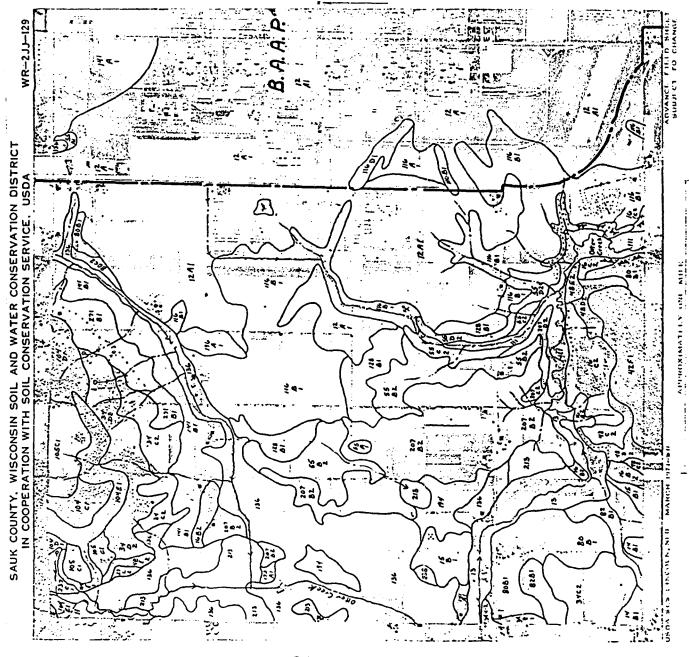






BADGER A.A.P. TOTAL PLANT OPERATIONS A second state of the second stat

!



#### BADGER A. A. P. TOTAL PLANT OPERATIONS EA

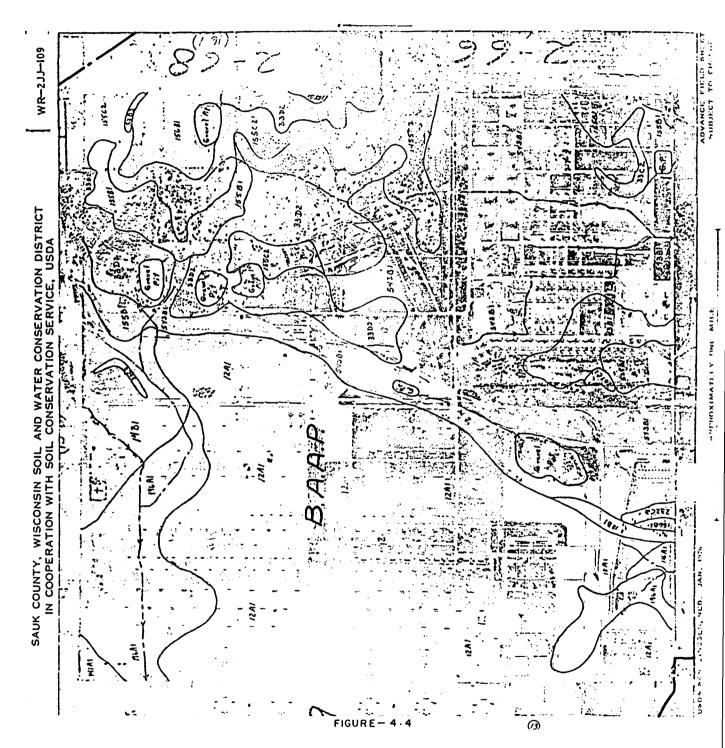
**271** 

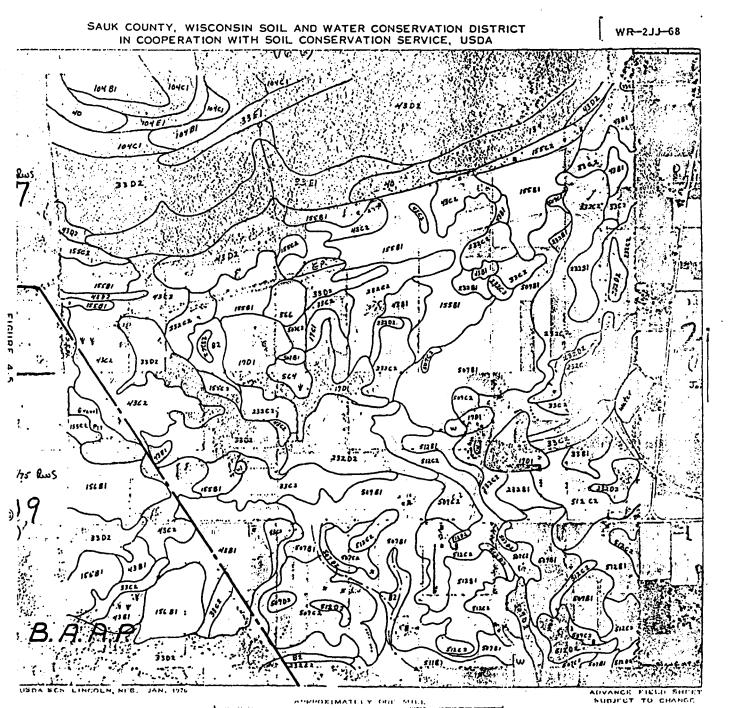
......

FIGURE 4.3 SOILS ANALYSIS KEY- SECTION WR-2JJ-129 -

!

## BADGER A.A.P. TOTAL PLANT OPERATIONS E A





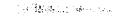
Þ

SUBJECT TO CHANGE

BADGER A.A.P. TOTAL PLANT OPERATIONS

m

≽



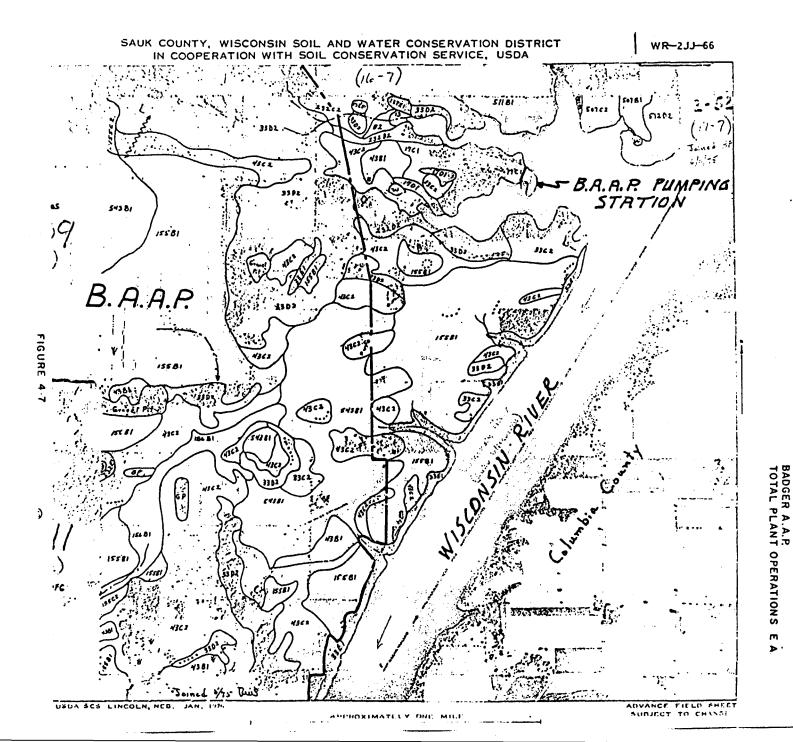
#### BADGER A. A. P. TOTAL PLANT OPERATIONS E A.

~

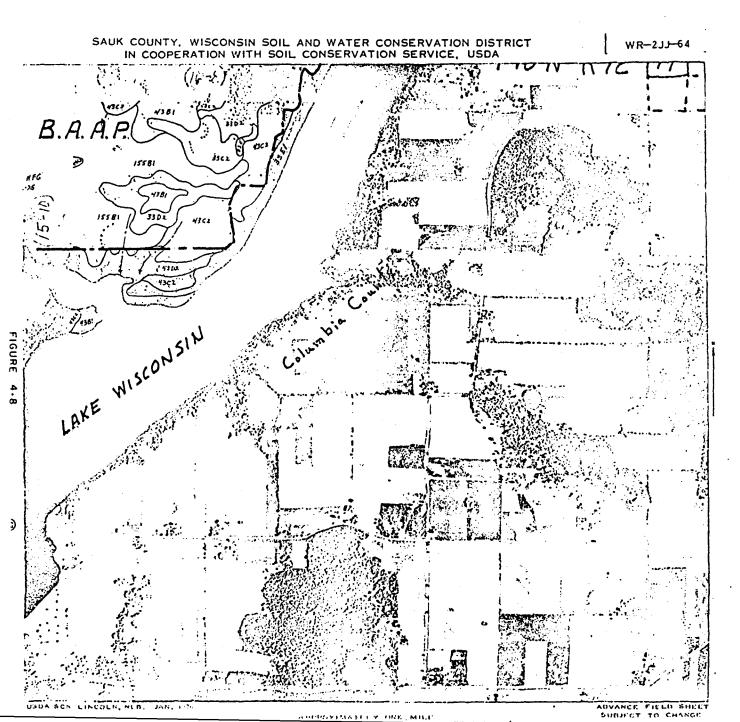


: 7

!



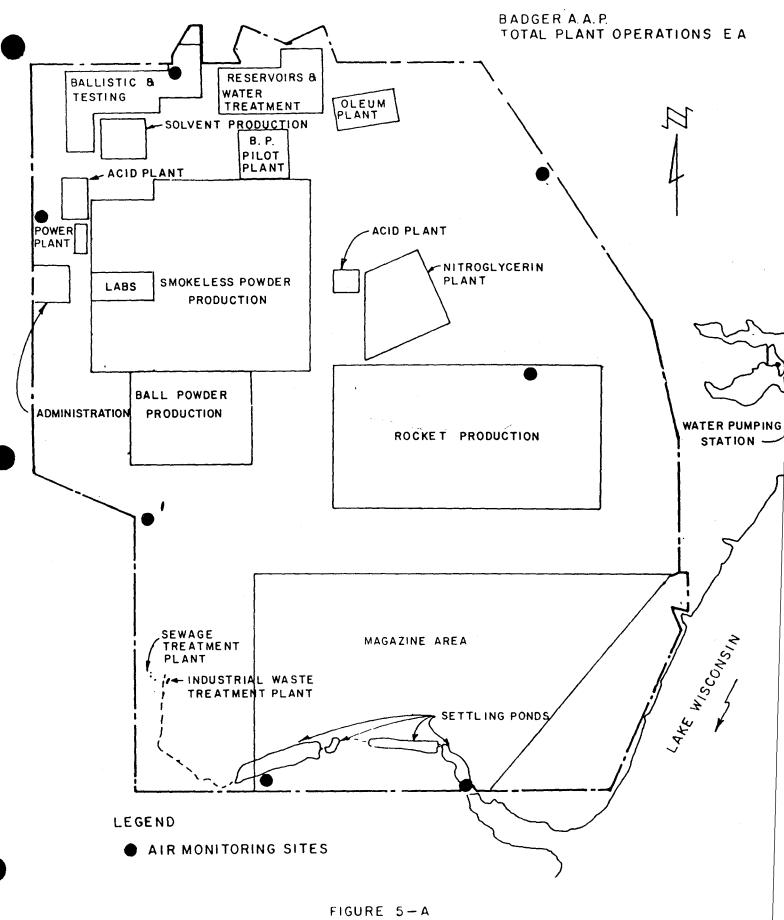
.-



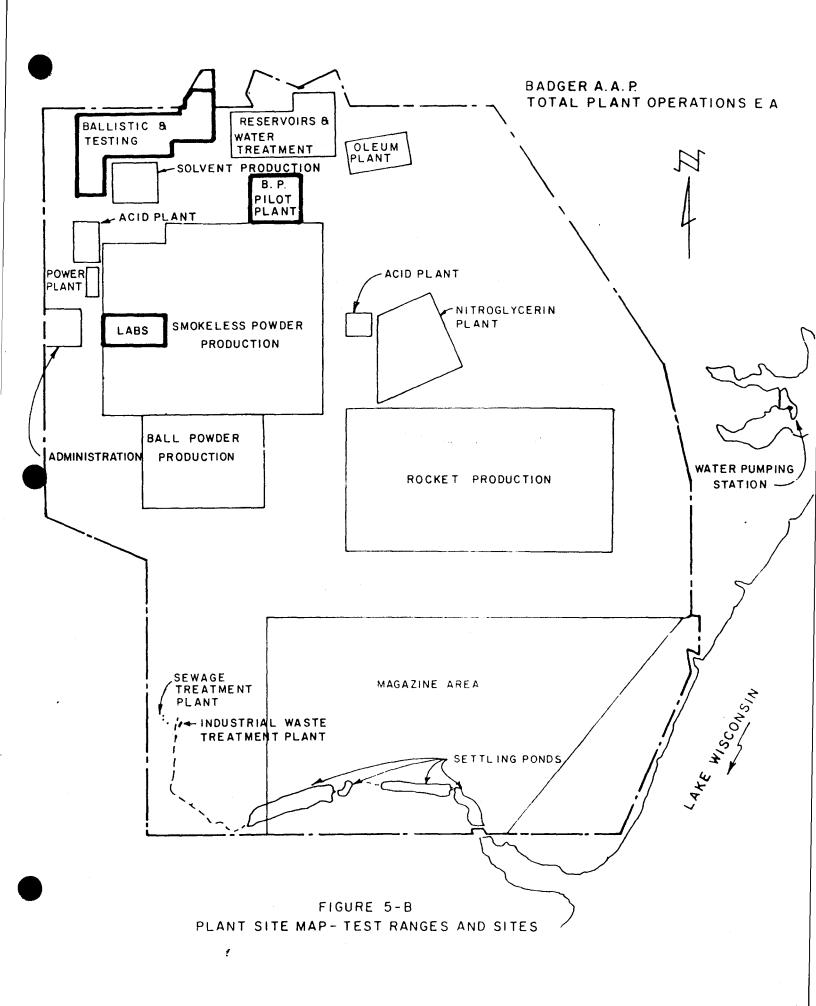
R A.A.P. PLANT OPERATIONS

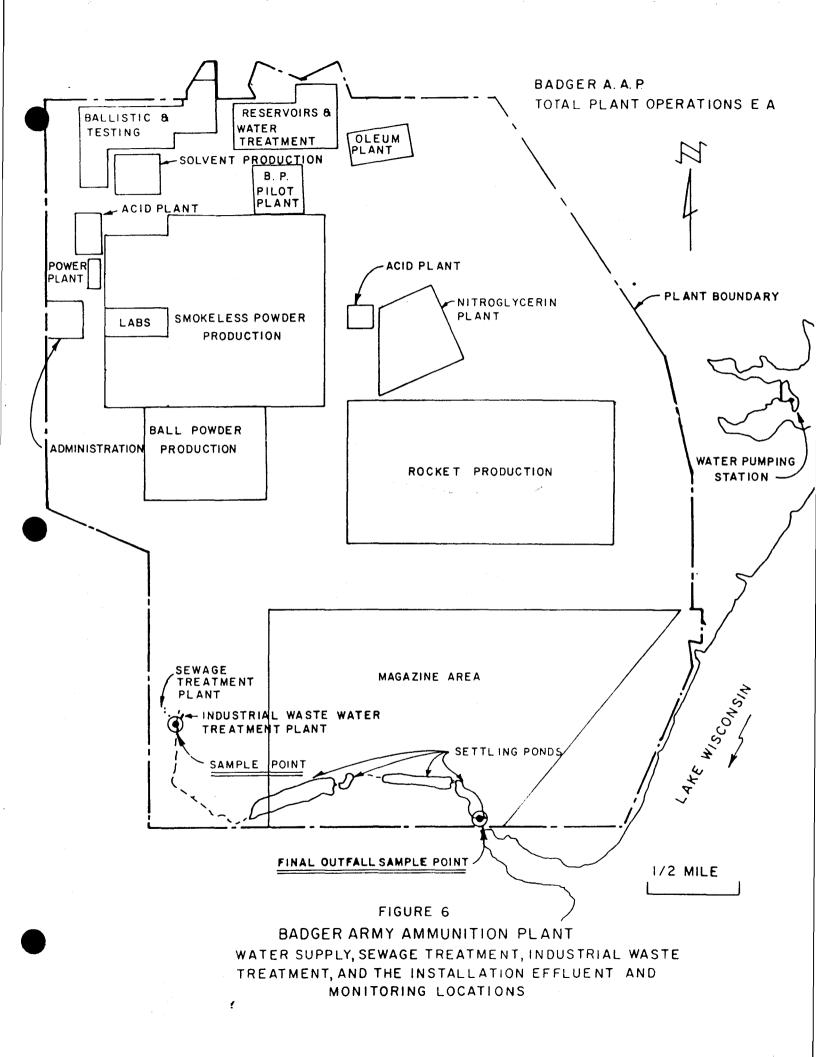
> m ⋗

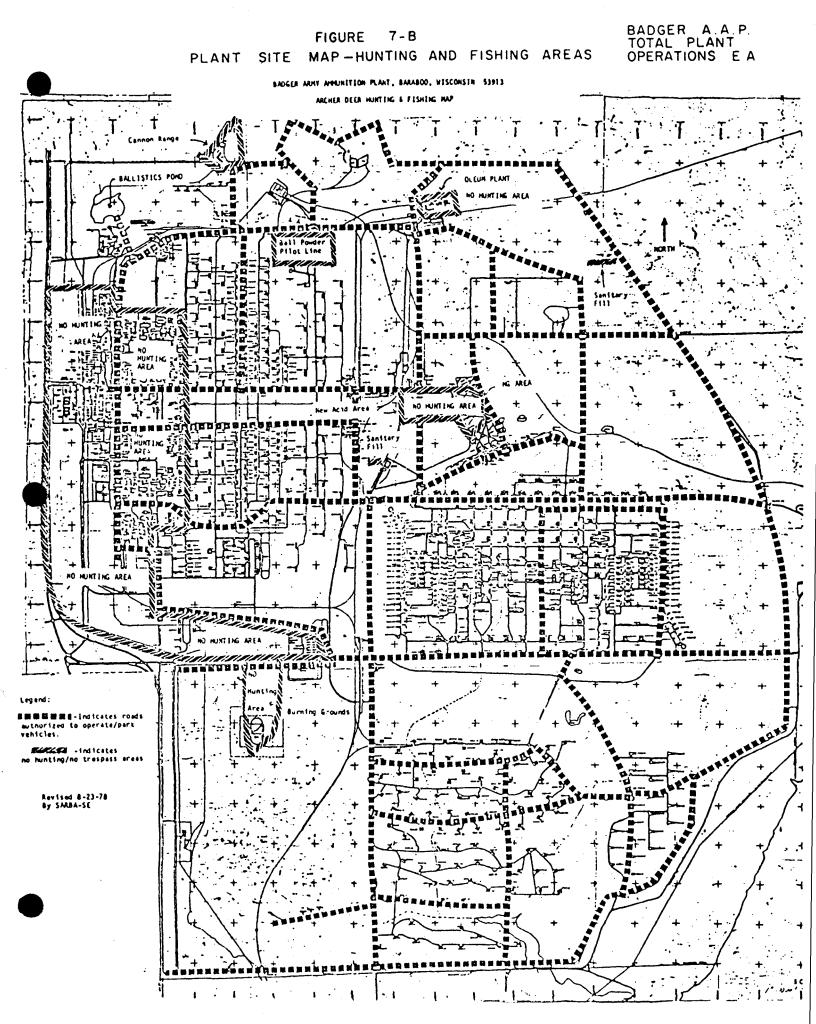
BADGER



PLANT SITE MAP- AIR MONITORING SITES, BOILER PLANTS, AND PRODUCTION AREA LOCATIONS







## BADGER AAP TOTAL PLANT OPERATIONS - EA

## ENVIRONMENTAL ASSESSMENT

## FOR

## TOTAL PLANT OPERATIONS

## TABLES

## Description

Table No.

I-A, I-B	Pollutants, Effluents, Production Rates, and Capacities
I-C	BAAP Solid Waste Disposal Sites
II-A	Facility Effluent Water Analyses
II-B	Water Effluent Pollutant Characteristics Comparison
II-C	Sanitary Treatment Plant Analyses
III-A	Air Pollutants at Badger Army Ammunition Plant
III-B	Summary of Source Sampling Measurements, Production Facilities (1970)
III-C	Stationary Fuel Combustion Units - Description and Particulate Emissions
III-D	Estimate of Air Pollution Emissions from Boilers at Capacity
III-E	Estimate of Air Pollution Emissions at Capacity from Existing Old Acid Area
III-F	Nominal Mobilization Levels Where Emissions are Expected to Exceed Permissible Levels
IV-A	Storage Areas - Petroleum Type Products
IV-B	Storage Areas- Chemical Agents, Explosives and Pyrotechnics
V-A	Flora and Fauna on the Installation - Mammals
V-B	Flora and Fauna on the Installation - Birds
V-C	Flora and Fauna on the Installation - Trees
V-D	Flora and Fauna on the Installation - Flowering Plants
V-E	Flora and Fauna on the Installation - Fish

## TABLE I-A

## TYPICAL POLLUTANTS, EFFLUENTS, PRODUCTION RATES AND CAPACITIES

#### BREAKDOWN OF POLLUTANT BY AREA Α.

	Sulfate	Nitrate	Total Dissolved Solids	Total Suspended Solids
BALL POWDER	6.5	Negligible	2.6	Negligible
NITRIC ACID	2.0	Negligible	0.8	3.5
NITROCELLULOSE	90.3	99	96.0	96.5
TREATED WATER	1.2	Negligible	0.5	Negligible

## B. EFFLUENT POLLUTANT CONCENTRATIONS AND NPDES PERMIT STANDARDS

Monitored Parameter	Effluent Characteristic				Applicable	
	<u>1969*</u> mg/1 1bs/day		<u>1973**</u> mg/1 1bs/day		<u>NPDES Limits***</u> mg/1 lbs/day	
TOC/COD	36	8,817	10	660	40	7,500
Nitrate	72	17,632	27	1,807	10	1,875
Total Dissolved Solids	1428	349,717	533	35,076	1000	187,500
Total Suspended Solids	86	21,061	6	395	25	4,690
Sulfates	554	135,674	133	8,763	100	18,750

Reference 3 in Bibliography \*

\*\*

Reference 4 in Bibliography Reference 5 & 7 in Bibliography \*\*\*

WPDES Permit application filed on 29 June 1982, is under review and processing by the Wisconsin Department of Natural Resources.

EA

## TABLE I-A (cont'd)

•

#### C. PRODUCTION LEVELS AT TIME OF USAEHA-EA REPORTS

Ν	Area	<u>1969</u> *	<u>1973</u> *
Nitr	c Acid 1	16 tons/day	25 tons/day
Nitro	cellulose 201,0	00 lbs/day	17,000 lbs/day
Rock	et 7,0	00 grains/day	5,000 grains/day
BALL	POWDER 35,0	00 lbs/day	32,000 lbs/day

\* Reference 3 and 4 of Bibliography

## D. PLANT DESIGN CAPACITIES

Area	Production Rate (daily basis)
Nitric Acid (Old-Existing)	250 tons
Nitric Acid (New)	400 tons
Sulfuric Acid (Old-Existing)	200 tons
Sulfuric Acid (Old)	350 tons
Nitrocellulose	500,000 lbs
Rocket	28,000 grains
BALL POWDER	100,000 lbs
Smokeless Propellant	533,000 lbs.

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE I-A

Т	A	B	L	Ε	1	-	В	

	Unit of Measurement	Existing Capacity	Modernized Capacity in Construction	Mobilization *** Requirement Existing Production Facilities	Mobilization *** Requirement Modern Production Facilities
Single Base (Ml and NACO)	1000 lb/mo	16,000 **	-	16,000	16,000
Ball Powder	1000 lb/mo	3,000 **	-	2,881	2,881
Extruded Solvent- less (2.75 Rkt Grain, 155 RAP)	1000 lb/mo	2,900	-	-	-
Weak Nitric Acid	ТРМ	7,500	10,800	8,961	7,359
Strong Nitric Acid	TPM	5,000	13,500	10,915	16,219
01eum .	ТРМ	7,500	10,980	7,713	7,289
Nitrocellulose	1000 lb/mo	16,600	· <u>-</u>	16,298	16,298
Nitroglycerin	1000 lb/mo	1,100	1,620	317	317
Steam	1000 1b/hr	1,386	-	1,550	1,180
Electricity	MVA	30	-	40	124
Water - Raw	MGD	43	-	11	-
Water - Treated	MGD	48	-	78	26

PRODUCTION AND SUPPORT CAPABILITY\*

\* Production capacities are based on a 27 day operating month.
 \*\* Ball Powder and Single Base "E" Line use same finishing buildings. New Single Base finishing buildings can be constructed after M-Day and meet mobilization schedule.

\*\*\* Interim requirements above standby status are direct factors of mobilization requirements.

ABLE DG SNOI. I-B 1 Ŕ

#### BAAP Solid Waste Disposal Sites\*

Site\*\* Size (Approx) Condition Types of Material Disposed of/Remarks Status Location No. Inactive/ 300'x100'x20' Crowned & covered Structural timbers, asphalt shingles, cardboard, paper, 1 NW 1/4 of NE 1/4 ~volume ≈600,000 cf with 3' compacted office type refuse, etc. closed of Section 14. "tons 035 lbs/cf soil TION, R6E (1942 - 1959)≈10,500 tons Open burning of propellant and extraction-waste (deterrent-Township Sumpter dinitrotoluene, dibutylphthalate, diphenylamine), benzene Sauk Co. WI and black powder were carried out at this site. No garbage (N 9700 E 6500) or explosives-contaminated waste was burned at this site. Badger Coordinate System 150'x150'x10' Crowned & covered Structural timbers, asphalt shingles, cardboard, paper. 2 NW 1/4 of NW 1/4 Inactive/ ~volume ≈225,000 cf with 3' of soil office refuse, etc. closed of Section 13. ~tons @35 lbs/cf TION, R6E (1969 - 1974)≃3.938 tons No explosive or propellant contaminated waste was buried Township Sumpter at this site. Sauk, Co (# 10100 E 9600) No open burning of any kind was practiced at this site. Badger Coordinate System 3 Inactive/ 400'x400'x20' Crowned & covered This was an old site for open burning of structural tim-SW 1/4 of NE 1/4 with 3' compacted ~volume =3,200,000 cf bers, asphalt shingles, cardboard, paper, office refuse, closed of Section 1. propellant & extraction waste. This waste, consisting soil TION. R6E (1960 - 1972)of deterrent (dinitrotoluene, dibuty)phthalate & diphenyl-Township Sumpter amine), benzene and black powder was burned in 3 small Sauk Co areas located at the east end of the site. These extrac-(N19000 E 13000) tion-wastes burning areas comprise less than 10% of the Badger Coordinate total site. Svs tem Although open burning practices attempted to achieve complete destruction of the waste materials, combustion was not always complete, and some of these materials and/or E combustion residuals remained. Action of melting snow & rainfall carried some of the residuals into the soil at the site. To prevent further surface water leaching & percolation, the deterrent burning area was covered with a heavy plastic membrane. This membrane was covered with 3' layer of soil to hold it in place and to protect it from weather & animal damage and to provide an additional barrier to water penetration. No explosive/propellant contaminated structural wastes or garbage were burned or buried at this site. 4 Inactive/ 600'x600'x25' Crowned & covered Uncontaminated wooden structural materials, asphalt NE 1/4 of NE 1/4 closed ~volume ≈9,000,000 cf with 4' of soil shingles and other construction type debris were buried of Section 11. "tons 035 lbs/cf here. TION, R6E (1969 - 1974)≈157,500 tons Township Sumpter No explosives, propellants, explosive/propellant contamin-Sauk Co, WI ated materials, or garbage were buried or burned at this (N15200 E 8300) site. Badger Coordinate System

BADGER AAP TOTAL PLANT OPERATIONS . EA

BAAP

TABLE 1-C SOLID WASTE DISPOSAL

Page 1

#### BAAP Solid Waste Disposal Sites\* Cont'd

.

No. L	ocation	Status	<u>Size (Approx)</u>	Condition	Types of Material Disposed of/Remarks
υ Τ Σ (	W 1/4 of NW 1/4 f Section 6, ION, R7E ownshib Merrimac auk Co, WI N 20000 E 14200) adger Coordinate ystem	Active (1972- )	1,000'x800'x20' `volume ≈16,000,000 cf `tons @35 lbs/cf and 40% fill ≈112,000 tons	49% of the potential volume is filled. The inactive portion is covered with 3' of soil. The active portion is operated using the fill, compaction and cover method with cell size dimensions varying according to daily activity.	<ul> <li>Uncontaminated wooden structural materials, asphalt shingles, construction-type debris, cardboard, pape office refuse, etc.</li> <li>No explosives, propellants, explosive/propellant contaminated materials or garbage have been buried or burned at this site.</li> <li>This site will continue as a solid waste disposal site for the disposal of materials similar to that noted above. At the current fill, compaction and cover rates, this site has an estimated life of 10 years.</li> <li>As the site is filled, it will be graded, crowned and covered with 2 feet of low permeable compacted soil and 6 inches of available top soil and seeded to hay grasses and crown vetch to prevent erosion and to reduce water infiltration and maximize evapotranspiration.</li> <li>A visual screen of white pine, multiflora rose and autumn olive will be developed approx. 50 feet from the edge of the plant road on the east side</li> </ul>
0 T V 0 T T S ( 3	1/2 of NW 1/4 f Section 14, 10N, R6E & the 1/2 of NE 1/4 f Section 14, 10N, R6E ownship Sumpter auk Co, WI N 9600 E 5800) adger Coordinate ystem	Active (1959- )		Burning Pads and Pits. No landfill.	<ul> <li>autumn olive will be developed approx. 50 feet from the edge of the plant road on the east side of the solid waste disposal site. This screen will also provide cover for existent wildlife.</li> <li>Explosive/propellant contaminated materials (con- struction debris, cardboard, wood, etc.) are burned on the burning pads provided for this purpose.</li> <li>Waste explosives and/or propellant materials are burned on burning pads provided for this purpose.</li> <li>These sites will continue to be used for the disposal of explosives and propellants and con- taminated waste until the proposed Contaminated Waste Processor (CWP) and Explosive Waste Inciner- ator (EWI) are constructed by the Corps of Engineers.</li> </ul>

\*\*Solid waste disposal sites are shown on Drawings #3094, Sheets 1-14.

ĒA

.....

Page 2

OB-777 Rev. 4

MGD Discharged 2.5 Estimated

#### OLIN CORPORATION WINCHESTER GROUP AMMUNITION OPERATIONS BADGER ARMY AMMUNITION PLANT BARABOO, WISCONSIN

Date Reported: 31	Dec
-------------------	-----

## ember 1974

Date Received: \_\_\_\_\_ 27 December 1974

EAN

#### LABORATORY ANALYSIS REPORT - FACILITY EFFLUENT WATER

LABURATURT ANALTSIS REPURT - FACILITE EFFLUENT WATER								
	EPA LIMITATION	Typica	1 BAAP	DISCHARGE	DISCHARGE 1bs/24		}	
ANALYSIS	Average Maximum	ANA	LYSIS	1bs/24 Hours	Average	Maximum	REMARK	S
Total Solids	No Requirement	647	mg/1		No Require	ment		
Total Volatile Solids	No Requirement	97	mg/1		No Require	ment		
Total Suspended Solids	75 mg/1 150 mg/1	17	mg/1	359	14,080	28,100		
Total Dissolved Solids	1250 mg/l 1750 mg/l	630	 	13,167	234,000	328,000		
Settleable Solids	No Requirement	Trace	m1/1		No Require	ment		
Dissolved Oxygen	5 mg/l Minimum*	11	mg/1	0 4°C.	No Requirement		Grab Samp 12/26/74	
Biochemical Oxygen Demand	No Requirement	13.3	mg/1		No Requirement		Grab Samp 12/26/74	le
Chemical Oxygen Demand	75 mg/l 150 mg/l	52.4	mg/l	1,095	14,080	28,100		FACI
Nitrite-N	No Requirement	0.8	mg/1		No Require	ment		FACILITY
Nitrate-N	90 mg/l 135 mg/l	18.4	mg/1	385	16,800	25,200		
Sulfate-S	150 mg/1 250 mg/1	82	mg/1	1,714	28,100	46,800		EFFLUENT
рН	Range - 6.0-9.0*	7.0	units	@ 21.7°F.	No Require	ment		IT WAT
Specific Conductance	No Requirement	880	umhos	@ 21.7°F.	No Require	ment		ER
Oil and Grease	- 10 mg/1	NR	mg/1		No Require	ment		ANAL
ТОС	No Requirement		mg/1		No Require	ment		ANALYSES
*State Requirement		Distribut	t <b>ion:</b> D. O D. S	. Thurow . Nancarrow	Prepared B	y: <u>D. M. PE</u> T	TERSON	OPERAT
				. Grames	Approved B	y: J. A. HOF	RMAN	Â

R. J. Thiede Filo

#### TABLE II-B

#### WATER EFFLUENT POLLUTANT CHARACTERISTICS COMPARISON

TYPE EMISSION		ICAL L EMISSIONS Lbs/Day	50% MOBIL Mg/Liter	IZATION	EMISSIONS 75% MOBIL Mg/Liter		100% MOBI Mg/Liter	LIZATION Lbs/Day	EMISSION 1 JULY 19 Mg/Liter	LIMITS 77 NPDES Lbs/Day
COD/TOC	36	660	36	11,000	36	16,500	36	22,000	40	7,500
Nitrate (N)	72	17,632	72	22,000	72	33,000	72	44,000	10	1,875
Total Suspended Solids	86	21,061	86	26,000	86	39,000	86	52,000	25	4,690
Total Dissolved Solids	1,428	349,717	1,428	.436,000	1,428	654,000	1,428	872,000	1,000	187,500
Sulfates	554	135,674	554	169,000	554	254,000	554	338,000	100	18,750

Note: Effluent pollutant concentrations at mobilization and other rates are assumed to be the same as 1969 concentrations. Total emission in lbs/day is a straight line computation.

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE II-B





#### OLIN CORPORATION WINCHESTER-WESTERN DIVISION ENERGY SYSTEMS OPERATIONS BADGER ARMY AMMUNITION PLANT BARABOO, WISCONSIN

MGD - 0.07

## Date Reported: <u>18 July 1978</u>

Date Received: 13 July 1978

#### LABORATORY ANALYSIS REPORT

#### SANITARY TREATMENT PLANT

ANALYSIS	EPA LIMITATION EFFLUENT ONLY AVERAGE MAXIMUM		INFLUENT	EFFLUENT	REMARKS	
	30 mg/l	45 mg/l	2.3 mg/1	0.6 mg/l	SANI	
BOD	5620 lb./24 Hr.	8430 1b./24 Hr.		0.35 1b/24 Hr.		
pH*			7.7 @ 18 <sup>0</sup> C	7.8 @ 18ºC		
Chlorine*			0.14 mg/1	0.28 mg/1	TREATMENT	TABLE
Total Suspended Solids*			5.2 mg/1	8.4 mg/l	PLANT	<u>11-C</u>
Settleable Solids			Trace ml/l	Trace ml/l	ANALYSIS	
Fecal Coliform	200 Colonies/ 100 ml.	400 Colonies/ 100 ml.	NR /100 m1	<one Colony/100 ml</one 	Sampled 7-12-78	]

\*State Reguirement

Distribution: R. J. Thiede

D. S. Nancarrow R. J. Priebe Prepared By: D. M. KOENIG

Approved By: P. S. YOUNG

3ADGER AAP TOTAL PLANT DPERATIONS -FABLE II-C

5

#### BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE III-A

,

### TABLE III-A

### AIR POLLUTANTS AT BADGER ARMY AMMUNITION PLANT

SOURCE	POLLUTANT	EXISTING CONTROL	PROPOSED CONTROL	STATUS
Oleum Plant	SO <sub>X</sub> Acid Mists	None Brinks Demister	New 350 tpd OV/SAR Plant	PEMA MOD FY72 - Under Construction
Nitric Acid Plant	NOX	None	New 400 tpd AOP Plant	MCA(old) long range PEMA MOD FY71 - Under Construction
Nitric Acid Concentrator	NOx Acid Mists	None Demister	2 Each New 250 tpd NAC/SAC	MCA (old) long range PEMA MOD FY71 - Under Construction
Nitrocellulose Lines	NO <sub>X</sub> Acid Mists	Fume Scrubber	New Nitration Facility	MCA - long range PEMA MOD FY89
Powerhouse No. 1	Particulate Matter NO <sub>X</sub> SO <sub>X</sub>	Low efficiency cyclone None Use of #2 fuel oil	Powerhouse boilers converted to #2 fuel oil	MCA Project FY71 Project Completed MCA-long range Powerhouse No. 2
Burning Grounds	Particulate Matter	None	Install approved incinerator for explosive and contaminated wastes	Currently under study. MCA Projects FY80-longe range

## TABLE IV-B

### STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE		DESCRIPTION OF	SIZE	ALARM SYSTEM	
AND PYROTECHNIC STORAGE		CHEMICAL AGENT,	IN		
AREA		PYROTECHNIC OR EXPLOSIVE	ACRES		
(1)	Old Acid Area Production Facility Complex Storage Area	<ol> <li><u>Chemical Agents</u></li> <li>62% Nitric Acid</li> <li>68% Sulfuric Acid</li> <li>Oleum</li> <li>Nitroglycerine Mixed Acid</li> <li>NG Semi Con Mixed Acid</li> <li>NG Con Mixed Acid</li> <li>NG Con Mixed Acid</li> <li>92% Sulfuric Acid</li> <li>80-20 Mixed Acid</li> <li>Ammonia</li> <li>Hydrated Lime</li> <li>Soda Ash</li> </ol>	(23) Outside Storage Tanks (6) Outside Ammonia Tanks (Approx. 2 acres total)	None	

BADGER AAP TOTAL PLANT OPERATIONS -TABLE IV\_B

۴A

## TABLE IV-B (Cont'd)

### STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE	DESCRIPTION OF	SIZE	ALARM SYSTEM
AND PYROTECHNIC STORAGE	CHEMICAL AGENT,	IN	
AREA	PYROTECHNIC OR EXPLOSIVE	ACRES	
(2) New Acid Area Production Facility Complex	<ul> <li><u>Chemical Agent</u></li> <li>1. 62% Nitric Acid</li> <li>2. 68% Sulfuric Acid</li> <li>3. Oleum</li> <li>4. Nitroglycerine Mixed Acid</li> <li>5. NG Semi Con Mixed Acid</li> <li>6. NG Con Mix Acid</li> <li>7. Con Mix Acid</li> <li>7. Con Mix Acid</li> <li>80-20 Mixed Acid</li> <li>10. Ammonia</li> <li>11. Soda Ash</li> <li>12. Sulfur</li> <li>13. 98% Nitric Acid</li> <li>14. Pyro Mixed Acid</li> </ul>	About 40 various acid, ammonia, petroleum and sulfur storage tanks (Approx. 4 acres)	None

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE IV-B

## TABLE IV-B (Cont'd)

•

## STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE AND PYROTECHNIC STORAGE AREA	DESCRIPTION OF CHEMICAL AGENT, PYROTECHNIC OR EXPLOSIVE	SIZE IN ACRES	ALARM SYSTEM
(3) B-Line, C-Line, D-Line, E-Line, F-Line Nitrocellulose Production Area, Acid Storage Area(s)	<pre>Chemical Agents 1. Oleum 2. 80-20 Mixed Acid 3. Pyrc Mixed 4. NC Spent Acid 5. NC Nitrating Mixed         Acid(s) 6. 62% Nitric Acid 7. Pebble Lime 8. Caustic Soda 9. Soda Ash 10. Wood Pulp 11. Cotton Linters 12. In process and Finished Nitrocellulose</pre>	20-22 Acid Tanks Per Line 2-1/2 acres per line x 5 lines = 12-1/2 acres	None
·			-10

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE IV-B

### TABLE IV-3 (Cont'd)

## STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

	MICAL AGENT, EXPLOSIVE PYROTECHNIC STORAGE	CHE	SCRIPTION OF MICAL AGENT, ROTECHNIC OR EXPLOSIVE	SIZE IN ACRES	ALARM SYSTEM
(1)	Nitroglycerin Production Areas (Old and New) Acid and Materials Storage	2.	Glycerine Nitroglycerine Mixed Acid	Glycerine and Storage Areas	None
	Areas.		NG Spent Acid NG Semi-Con Mixed Acid	(Approx. 2 acres)	
	Nitroglycerine is stored		NG Con Mix Acid		
	at each step of the	<u>6</u> .	Rock Salt		
	production process.	7. 8.	Sodium Silica Fluoride Castor Oil		

BADGER ANP TOTAL PLANT OPERATIONS -TABLE IV-B 1

m

## TABLE IV-B (Cont'd)

## STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE	DESCRIPTION OF	SIZE	ALARM SYSTEM
AND PYROTECHNIC STORAGE	CHEMICAL AGENT,	IN	
AREA	PYROTECHNIC OR EXPLOSIVE	ACRES	
(1) Oleum Plant (cld) Production Area, Storage Area	1. 80-20 Mixed Acid 2. 92% Sulfuric Acid 3. Oleum 4. Sulfur 5. Soda Ash	Sulfur tank and pit, Oleum tank, 92% sulfur tank, 80-20 tank Total size - about 1 acre	None

BADGER AAP TOTAL PLANT OPERATIONS TABLE IV-B 1 m

## TABLE IV-3 (Cont'd)

## STORAGE AREAS

## CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

	MICAL AGENT, EXPLOSIVE PYROTECHNIC STORAGE	DESCRIPTION OF CHEMICAL AGENT, PYROTECHNIC OR EXPLOSIV	SIZE IN VE ACRES	ALARM SYSTEM
(1)	<ul><li>BALL POWDER Production Area, Storage Area and Auxiliary BALL POWDER Line Storage.</li><li>BALL POWDER is stored at each of the production processes.</li></ul>	<ol> <li>Benzene</li> <li>Ethyl Acetate</li> <li>Isopropyl Alcchol</li> <li>Colloid</li> <li>Diphenylamine</li> <li>Sodium Sulphate</li> <li>Calcium Carbonate</li> <li>Ethyl Cellulose</li> <li>Tin Dioxide</li> <li>Potassium Nitrate</li> <li>Graphite</li> <li>Salvage Propellant</li> <li>Nitroglycerine</li> </ol>	<ul> <li><u>Auxiliary Line</u> <ol> <li>NG Storage Bldg. 8018</li> <li>Tank F.rm, Bldg. 8009</li> <li>Solvent Handling 8009         (One acre)</li> </ol> </li> <li><u>Main Line</u> <ol> <li>Eight (8) NG Storage Transfer Bldgs.</li> <li>Solvent Tank Farm Bldg. 9546</li> <li>Solvent Storage Eldg. 9502-1 thru 5</li> <li>Powder Storage Pits Bldg. 9590</li> <li>Solvent Receiving Bldg. 9594</li> </ol> </li> </ul>	None
				BADGER AAP TOTAL PLANT OPERATIONS - TABLE IV-B

**m** 

# TABLE IV-B (Cont'd)

### STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE	DESCRIPTION OF	SIZE	ALARM SYSTEM
AND PYROTECHNIC STORAGE	CHEMICAL AGENT,	IN	
FREA	PYROTECHNIC OR EXPLOSIVE	ACRES	
(1) Smokeless Production Complex (B, C, D & E Lsnes) Storage Areas, including Ether, Alcohol, Inert Gas Smokeless propellant is stored at each of the propellant production processes.	<ol> <li>Alcohol</li> <li>Ether</li> <li>Caustic Soda</li> <li>Propane</li> <li>Dinitrotoluene (DNT)</li> <li>Diphenylamine (DPA)</li> <li>Potassium Sulfate</li> <li>Ethyl Centralite</li> <li>Lead Carbonate</li> <li>Butyl Stearate</li> <li>Nitrocellulose</li> <li>In-process single base propellant</li> </ol>	<ol> <li>Alcohol-Ether Storage Production Area 39 Tanks (Approx. 6 acres)</li> <li>Inert Gas - 9 Tanks (Approx. 1 acre)</li> <li>Various Storage Tanks in each line (Approx. 1 acre/line x 4 lines = 4 acres)</li> </ol>	No Alarm System

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE IV-B

1.

## TABLE IV-3 (Cont'd)

.

## STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

	IICAL AGENT, EXPLOSIVE PYROTECHNIC STORAGE	Сне	ECRIPTION OF MICAL AGENT, ROTECHNIC OR EXPLOSIVE	SIZE IN ACRES	ALARM SYSTEM
(1)	Rocket Production Storage Area Rocket Double Base Propellant is stored at each step in the production process.	2. 3. 4. 5. 6. 7. 7. 8. 9. 10. 11. 12. 13. 14.	(Ethyl Lactate - Butyl Acetate) Lead Stearate Lead Beta Resorcylate		None
		16.	Double Base Propellant and Grains		

BAUGER AAP TOTAL PLANT OPERATIONS - EA TABLE IV-B

## TABLE IV-3 (Cont'd)

## STORAGE AREAS

## CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE AND PYROTECHNIC STORAGE AREA	DESCRIPTION OF CHEMICAL AGENT, PYROTECHNIC OR EXPLOSIVE	SIZE IN ACRES	ALARM SYSTEM
(1) Magazine Area	1. Various Single Base Smokeless Propellants	123 Storage Magazines	No Alarm System
		2,329,308 sq. ft. of	Inspected by security
	<ol> <li>Various BALL POWDER Propellants</li> </ol>	storage capacity	personnel on an around the clock basis.
	·	23,125 tons Propellant	
	<ol> <li>Yarious Double Base Rocket Propellants</li> </ol>	storage capacity	
		(Approx. 6,000' x 9000' 1,240 acres)	

BADGER AAP TOTAL PLANT OPERATIONS - EJ TABLE IV-B

## TABLE IV-B (Cont'd)

## STORAGE AREAS

### CHEMICAL AGENTS, EXPLOSIVES, AND PYROTECHNICS

CHEMICAL AGENT, EXPLOSIVE	DESCRIPTION OF	SIZE	ALARM SYSTEM
AND PYROTECHNIC STORAGE	CHEMICAL AGENT,	IN:	
AREA	PYROTECHNIC OR EXPLOSIVE	ACRES	
(1) General Plant Support Facilities, including Filtration, Water Treatment, Sewage Disposal, Warehousing	<ol> <li>Aluminum Sulphate</li> <li>Anmonia Sulphate</li> <li>Liqua Treat</li> <li>Cat-Floc</li> <li>Chlorine</li> <li>Lime</li> <li>Salt</li> <li>Soda Ash</li> </ol>	No specific tank farm as such; however, various tanks, cylinders, etc., stored as necessary to accomplish desired support elements.	None

BADGER AAP TOTAL PLANT OPERATIONS - E/ TABLE IV-B

۰.

#### TABLE V

BADGER AAP TOTAL PLANT OPERATIONS - EA

Population

#### FLORA AND FAUNA ON THE INSTALLATION

A. Mammals

Common Name

Whitetail Deer Raccoon Opossum Skunk

Badger

Red Fox

Grey Fox

Fox Squirrel Grey Squirrel Woodchuck

Cottontail Rabbit

Eastern Chipmunk Deer Mouse House Mouse Flying Squirrel Red Bat Muskrat

Eastern Mole

(<u>Odocoileus virginianus)</u> (<u>Procyon lotor</u>) (<u>Didelphis virginiana</u>)

Scientific Name

(Taxidea taxus)

(<u>Mephitis nigra</u>)

(Vulpes fulva)

(Urucyn cinereoargenteus)

(<u>Scirurus niger</u>) (<u>Scirurus carolinensis</u>) (<u>Marmota monax</u>)

(Sylvilagus floridanus)

(Tamias striatus) (Peromyscus leocupus) (Mus musculus) (Glaucomys volans) (Laisurus borealis) (Ondatra zibethicus)

(Scalopus aquaticus)

Woodlands	Abundant
Woodlands	Abundant
Woodlands	Abundant
Woodlands &	Moderate
open areas	
Woodlands &	Moderate
open areas	
Woodlands &	Moderate
open areas	
Woodlands &	Rare
open areas	
Woodlands	Abundant
Woodlands	Moderate
Woodlands &	Moderate
open areas	
Woodlands &	Moderate
open areas	
Open areas	Abundant
Woodlands	Moderate
Buildings	Moderate
Woodlands	Rare
	Moderate
Ponds &	Moderate
streams	
Underground	Moderate
-	

Habitat

TABLE V (Cont'd)

B. Birds

#### Common Name

Barn Swallow Black & White Warbler Black Capped Chickadee Bluebird Blue Jay Blue Winged Teal Bobolink Bobwhite Quail Brewers Blackbird Brown Creeper Canada Goose **Canvasback Duck** Cardinal Cowbird Evening Grosbeak Golden Crowned Kinglet Horned Lark Horned owl Junco Kingbird Mallard Meadowlark Mourning Dove Pintail Duck

Red Eyed Vireo Red Tailed Hawk Robin Rose Breasted Grosbeak Ruby Throated Hummingbird **Ruffed Grouse** Scarlet Tanger Starling Tufted Titmouse Turkey vulture White Breasted Nuthatch Woodcock Wood Thrush Brown Thrasher Catbird **Killdeer** Yellow Shafted Flicker Great Blue Heron Wood Duck Sparrow Hawk Ring Necked Pheasant Common Nighthawk Red Headed Woodpecker Yellow Bellied Sapsucker Downy Woodpecker Tree Swallow

#### Scientific Name

( <u>Hirundo rustica erythrogaster</u> )
( <u>Mniotilta varia</u> )
( <u>Parus atricapillus</u> ) (Sialia <u>sialis</u> )
( <u>Cyanocitta cristata</u> )
(Anas discors)
(Dolichonyx orizivorus)
( <u>Colinus virginianus</u> )
(Euphagus cyanocephalus)
<u>(Certhia familiaris</u> ) ( <u>Branta canadensis</u> )
(Aythya valisineria)
( <u>Richmondena cardinalis</u> )
( <u>Molothrus ater</u> )
( <u>Hesperiphona vespertina</u> )
(Regulus satrapa)
( <u>Eremophila alpetris</u> ) ( <u>Bubo virginianus</u> )
(Junco hyemalis)
(Tyrannus tyrannus)
(Anas platyrhynchos)
( <u>Sturnella magna</u> )
( <u>Zenaidura microura</u> )
( <u>Anas acuta tzitzihoa</u> )
(Viero olivaceus)
(Buteo jamaicensis)
( <u>Turdus migratorius</u> )
( <u>Pheucticus ludovicianus</u> ) ( <u>Archilochus colubris</u> )
(Bonasa umbellus)
(Piranga olivacea)
(Sturnus vulgaris)
(Parus bicolor)
( <u>Cathartes aura</u> )
( <u>Sitta carolinensis</u> ) ( <u>Scolopax rusticola</u> )
(Hylocichla mustelina)
(Toxostoma rumpum)
(Dumetella carolinensis)
( <u>Charadrius vociferues</u> )
<u>(Colaptes auratus)</u>
(Ardea herodias)
( <u>Aix_sponsa)</u> ( <u>Falco_sparuerius</u> )
(Phasianus Colchicus)
(Chordeiles minor)
(Malenerpes erythrocephalus)
( <u>Sphyrapicus varius</u> )
( <u>Dendrocopus_pubescens</u> )
(Iridoprocne_bicolor)

#### Population

:

Moderate Rare Moderate Rare Abundant Moderate Abundant Rare Moderate Moderate Migratory Migratory Moderate Moderate Moderate Moderate Moderate Rare Moderate Moderate Moderate Abundant Abundant Migratory Moderate Moderate Abundant Rare Moderate Moderate Rare Moderate Moderate Moderate Moderate Migratory Moderate Moderate Moderate Abundant Moderate Few Moderate Moderate Moderate Moderate Abundant Moderate Moderate Moderate

#### B. Birds (Cont'd)

#### Common Name

Crow House Wren Ruby Crowned Kinglet Cedar Waxwing English Sparrow Baltimore Oriole Indigo Bunting American Goldfinch Purple Finch Rufous Sided Towhee Fox Sparrow

#### Scientific Name

(Corvus brachyrhynchos) (Troglodytes aedon) (Regulus calendula) (Bombycilla cedrorum) (Passer domesticus) (Icterus galbula) (Passerina cyenea) (Spinus tristis) (Carpodacus purpureus) (Pipilo erythrophthalmus) (Passerella iliaca)

#### **Population**

Abundant Abundant Moderate Moderate Rare Moderate Migratory Rare Moderate

BADGER AAP TOTAL PLANT OPERATIONS - EA

TABLE V (Cont'd)

C. Trees

Common Name

Apple Aspen Basswood Birch Box Elder Butternut Cedar, Red Cedar. White Cherry, Black Cherry, Choke Cherry, Pin Cottonwood Hackberry Hickory, Bitternut Hickory, Shagbark Locust, Black Maple, Sugar Maple, Black Mulberry, Red Oak, Black Oak, Red Oak, White Oak, Bur Pine, Red Pine, White Prickly Ash Spruce, White Walnut, Black Willow, Black White Ash Elm, American

Scientific Name

(Pvrus malus) (Populus) <u>Tilia americana</u>) <u>Betula</u>) Acer negundo) Juglans cinerea) Juniperus virginiana) Thuja accidentalis) Prunus serotina) Prunus virginiana) <u>Prunus pensylvanica</u>) Populus deltoides) <u>Celtis occidentalis</u>) Carva cordiformis) Carva ovata) <u>Robinia pseudoacacia)</u> Acer saccharum) Acer nigrum) Morus rubra) Quercus velutina) Quercus rubra) Quercus alba) Quercus\_macrocarpa) <u>Pinus resinosa</u>) Pinus strobus) (Xanthoxylum americanum) (<u>Picea glauca</u>) Juglans nigra) Salix nigra) (Fraxinus americana) (<u>Ulmus americana</u>)

BADGER AAP TOTAL PLANT OPERATIONS - EA

### D. Flowering Plants

Common Name

Alfalfa Asparagus Bindweed Bittersweet Blackberry Black Medic Bracken Fern Bush Honeysuckle Butter and Eggs Butterflyweed Carrion Flower Cattail Chickory Chickweed Clover Cocklebur Coneflower Cowslip Creeping Charlie Dandelion Davlilv Dutchman's-Breeches Elderberry Evening Primrose Flag Iris Geranium Goatsbeard Grape Hawkweed Hazelbrush Hemp Hound's Tongue Ironweed Ivy, Poison Jack-in-the-pulpit Jewelweed Knotweed Lettuce, Wild Lilac Mayapple Milkweed, Common Mock Orange Mullein Pepper Grass Phlox Phlox Pigweed Plantain Oueen Anne's Lace

#### Scientific Name

(Mediago s**a**tiva) (Asparagus) Convolvulus) Celastrus) Rubus alleq.) Medicago lup.) Pteridium) (Diervilla) (Linaria) Asclepias) Smilax) <u>Typha latifolia</u>) <u>Cichorium</u>) <u>Cerastium stellaria</u>) <u>Trifolium</u>) Xanthium) Rudbeckia) Caltha) Nepeta Hed.) <u>Taraxacum officinale</u>) (Hemerocallis) (Dicentra cucullaria) Sambucus) <u>Oenothera</u>) (<u>Iris versicolor Linnaeus</u>) (Geranium) Tragopogon) (Vitis) (<u>Hieracium</u>) (Corvlus) (<u>Cannabis</u>) (Cynogolossum) (Vernonia) (Rhus radicans) (Arisaema) (Impatiens) Polygonum) (<u>Lactuca</u>) (<u>Syringa</u>) (Podophyllum peltatum) (Asclepias · syriaca) (Philadelphus) (Verbascum) (Lepidium) (Phlox) (Chenopodium) (Plantago) (Daucus)

BADGER AAP TOTAL PLANT OPERATIONS - EA

TABLE V (Cont'd)

Scientific Name

D. Flowering Plants (Cont'd)

.

Common Name

Ragweed Raspberry Rocket, Yellow St. John's Wort Smartweed Salemants Saal	(Ambrosia) (Rubus occ. and id.) (Barbarea) (Hypericum) (Polygonum)
Solomon's Seal	( <u>Polygonatum</u> )
Sticktights	( <u>Bidens)</u>
Strawberry	( <u>Frágaria</u> )
Sumac	( <u>Rhus</u> )
Sweet Clover	(Melilotus)
Thorn Apple	( <u>Crataegus</u> )
Vervain	( <u>Verbena</u> )
Vetch	( <u>Lathyrus</u> )
Violet	( <u>Viola</u> )
Wintergreen	( <u>Gaultheria</u> )
Yarrow	( <u>Achillea</u> )
Cardinal Flower,-Red Lobelia	( <u>Lobelia cardinalis</u> )
Milkweed, Whorled	( <u>Asclepias verticillata</u> )

TABLE V (Cont'd)

.

## E. Fish

.

Common Name	<u>Scientific Name</u>		Population
Bass	(Micropterus)	ţ	Moderate
Bluegill	(Helioperca incisor)		Abundant
Crappie	( <u>Pomoxis Annularis</u> )		Abundant

.

.

.

### TABLE III-B

#### SUMMARY OF SOURCE SAMPLING MEASUREMENTS, PRODUCTION FACILITIES (1970)

### BADGER ARMY AMMUNITION PLANT

		STACK	STACK	STACK FLOW	SO <sub>R</sub> CONCENTRA	SO EATISSION	NO	NO <sub>R</sub> EMISSION	TOTAL ACIDI TY	ACID MIST	ACID MIST	•	ARTICULATES
SAMPLING LOCATION	PRODUCTION	PRESSURE (mm Hg)	TEMPERA- TURE ("CI	AATE (M <sup>3</sup> /SEC)	TION AS SO <sub>2</sub> (PPM)	RATE AS SO <sub>2</sub> IGM/SECI	CONCENTRA- TION AS NO <sub>2</sub> IPPMI	AATE AS NO <sub>2</sub> IGM/SECI	EMISSION RATE (GM/SEC)	EMISSION RATE (GM/SEC)	CONCENTRA- TION (MG/M <sup>3</sup> )	LO PER DAY	CONCEN TRATES (PPM/NBTU)
NC FUME EXHAUST SYSTEM	49 802 L.B (Р - 7) В MR	121	26.0	357			550	34	1.87	0 11 MNO 3	30 B		
LINE B	45,533 L 0 (P - 1)/ 8 H R	736	26.0	244		· · ·	480	21	0.53	0 14 MNO 3	57.4		
NC FUME EXHAUST SYSTEM	43 000 LB (P = 1) <sup>2</sup> В НИ	737	26.0	2 96			245	1.4	1.70	0 20 HNO	67 6		
LINE C	43,000 LB (P - 3)/ 8 HR	736	26.0	274			300	1.3	0 64	0.19 HNO	<b>49.3</b>		
	40,000 L8 (L ))/ 8 HR	736	26.0	3 14			365	1.5	1.43	0 79 HNO	97.4		
CILEUM STACK IBLDG NO 728-21	250 T/DAY	233	37.7	7.22	2760	47				0 10 H250	13.9		
AOP (BLDG NO 202) CONPAESSOR STACK NO 2	167 T/DAY 172 T/DAY 188 T DAY	738 740 741	76 0 86 0 69 0	194 227 199			1730 1910 1379	6.5 8.3 4.7					
NAC (BLDG NO 2031	150 T/DAY	741	830	0 20			16200	6.2					
BOILER 5 STEAM GCN ERATING STA	75009 L 8/H A 150.000 L 8/H C K							5.14				\$5000	53 88
APSA EMISSIUN STANDERS					200		200				50		

Report No. 96020.007 - Army Munitions Plants Modernization Program, Pollution Abatement Review Final Report - Picatinny Arsenal

BADGER AAP TOTAL PLANT OPERATIONS -TABLE III-B EA

#### TABLE III-C

### STATIONARY FUEL COMBUSTION UNITS - DESCRIPTION AND PARTICULATE EMISSIONS

Building Number	Fuel	Boilers	MBTU/Hr. Boiler Capacity	Number of <u>Stacks</u>	Boilers per Stack	Stack Height Feet	Estimated Lb./MBTU	Allowable Lb./MBTU
400-1	No. 2 0il	5	210	5	1	128	0.06	0.60**
400-1	No. 2 0il	4	26	2	2	35	0.11	0.60**
6538	Bituminous Coal	4	120	4	1	133	5.94*	0.40

\* Estimated emission based upon 8.8% Ash and 12,600 BTU/1b. Coal.

\*\* Interpretation of APS-1 by the State of Wisconsin allows 0.60 lb./MBTU for units burning fuel oil and for the size of the units described above.

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE III-C

The above information is taken from the U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground Report, Air Pollution Engineering General Survey No. 66, 0137-77, Badger Army Ammunition Plant (16-18 August 76).

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE III-D

#### TABLE III-D

### ESTIMATE OF AIR POLLUTION EMISSIONS FROM BOILERS AT CAPACITY \*

Building Number	Boiler <u>Capacity</u>	No. of Boilers	Pollutant Em Total of All	Boilers
			-	Lbs/Hr.
400-1	210 MBTU/Hr.	5	Particulates SO <sub>x</sub>	112 432
(Fuel:	#2 Fuel Oil)	•	CO HC NO <sub>X</sub>	30 22.5 600
400-1	26 MBTU/Hr.	4	Particulates	11.2
(Fuel:	#2 Fuel Oil)		SO <sub>X</sub> CO HC NO <sub>X</sub>	42.9 2.98 2.23 59.5
	120 MBTU/Hr. Coal Bituminous) (12,600 BTU/Lb.) (3.3% Sulfur - 8.8% A	4 sh)	Particulates SO <sub>X</sub> CO HC NO <sub>X</sub>	2848 2383 5.7 342.7 19.04
Not availab at this time		J	Particulates SC <sub>X</sub> CO HC NC <sub>X</sub>	22.4 86.4 6.0 4.5 120.0
Not availab at this time		1	Particulates SO <sub>X</sub> CO <sup>X</sup> HC NO <sub>X</sub>	1246.0 1042.56 2.49 149.93 8.33

\* NOTE: See \*\* note on Table III-E.

\*\* Emissions noted are at full capacity and assumes mobilization schedule requirements. Intermediate requirements will vary according to production schedule and will be proportional to the mobilization rates.

#### BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE III-E

#### TABLE III-E

#### ESTIMATE OF AIR POLLUTION EMISSIONS AT CAPACITY

#### FROM EXISTING OLD ACID AREA \*

Building Number	Facility	Number of Units		nt Emission f All Units
				Lbs./Hr.
702	AOP	6	NOX	460
703	NAC	16	NO <sub>X</sub>	194
704	SAC	10	NO <sub>X</sub> SO <sub>X</sub>	1334 * 2990
728	01eum	1	so <sub>x</sub>	391
Various	NC	5	NO <sub>X</sub>	106.1

- \* The plant is in a standby condition at this time so no pollutants are being produced in the production area.
- \*\* This number is based on BAAP calculations made from data where judgemental considerations and theoretical conclusions have been used. The number is not based on measurements taken from actual operating conditions at BAAP, and must be considered as an order of magnitude number. Any conclusions drawn from the use of this number should be so qualified.

It is estimated that the pollutant emissions at mobilization will be as follows for the new Acid facilities:

400 Tons/Day	Nitric Acid	NO <sub>2</sub>	1200 Lbs/Day
500 Tons/Day	Nitric Acid Concentrator	N02	1500 Lbs/Day
350 Tons/Day	Oleum	S02	1400 Lbs/Day
500 Tons/Day	Sulfuric Acid Concentrator	S02	2000 Lbs/Day
350 Tons/Day	Oleum	Acid Mist	52.5 Lbs/Day

Emissions noted are at full capacity and assumes mobilization schedule requirements. Intermediate requirements will vary according to production schedules and will be proportional to the mobilization rates.

TABLE III-F

.

.

TOTAL PLANT OPERATIONS - EA

NOMINAL MOBILIZATION\* LEVELS WHERE EMISSIONS ARE EXPECTED TO EXCEED PERMISSIBLE LEVELS

	MOBILIZATION LEVEL
	10 20 30 40 50 60 70 80 90 10
Powerhouse #1	Capacity
(as is)	Pollution Abatement Standards Met - Air**
	Pollution Abatement Standards Met - Water
Powerhouse #1	Capacity
(with additional boiler)	Pollution Abatement Standards will be met - Air***
	Pollution Abatement Standards will be met - Water
Powerhouse #2	Capacity
	Pollution Abatement Equip. Required to meet Standards - Air
	Pollution Abatement Standards will be met - Water
	Capacity
Old Acid Area	Pollution Abatement Equip. Required to meet Standards - Air
	Pollution Abatement Equip. Required to meet Standards-Water
······································	Capacity
New Acid Area	Pollution Abatement Standards will be met - Air
	Pollution Abatement Standards will be met - Water
	Capacity
Nitrocellulose	Pollution Abatement Equip. Required to meet Standards - Air
	Pollution Abatement Equip. Required to meet Standards-Water
	Capacity - equal to 130% of mobilization requirements
Nitroglycerin	Pollution Abatement Standards will be met - Air
	Pollution Abatement Standards will be met - Water
Smokeless	Capacity
	Pollution Abatement Standards will be met - Air
	Pollution Abatement Standards will be met - Water
	Capacity
BALL POWDER	Pollution Abatement Standards will be met - Air
	Pollution Abatement Equip. Required to meet Standards-Water

TABLE III-F (cont'd)

BADGER AAP TOTAL PLANT OPERATIONS - EA TABLE III-F

- \* Basis: Industrial Readiness Plan September 1977.
- \*\* Assumes No. 2 Fuel Oil is burned to provide required steam.
- \*\*\* Assumes current boilers fired with No. 2 Fuel Oil. Additional boiler is fired with coal, but is equipped with necessary pollution abatement equipment.

## TABLE IV-A

•

.

.

## STORAGE AREAS

## PETROLEUM-TYPE PRODUCTS

LOCATION	NUMBER OF <u>TANKS</u>	(a) ABOVE GROUND/ BELOW GROUND	(b) CAPACITY GALLONS	(c) PRODUCT STORED	(d) DIKED	(e) EVAPORATION LOCK
Powerhouse #1 " 400-1 " "	3 3 1 2 2	Above Below Below Above Below	825,000 17,000 11,000 10,000 10,000	#2 Fuel Oil #2 Fuel Oil #2 Fuel Oil #2 Fuel Oil #2 Fuel Oil #2 Fuel Oil	Yes N/A N/A Yes N/A	Yes No No Yes Yes
Pilot Plant (8014)	1	Below	16,000	#2 Fuel Oil	N/A	Yes
Filtration Plant (409-1)	1	Below	3,000	<b>#2 Fuel Oil</b>	N/A	No
River Pump (408)	1	Below	3,000	#2 Fuel Oil	N/A	No
Fire Station (222)	1	Below	3,000	#2 Fuel Oil	N/A .	Yes
Filtration Plant (409)	5	Below	110	Gasoline	N/A	Yes
Tram Shop 522	1	Below	1,000	Gasoline	N/A	No
Forge& Weld Shop (520)	1	Below	3,000	Gasoline	N/A	No
01eum 728-2	۱	Below	000, ۱	#2 Fuel Oil	N/A	BADGER TOTAL I TABLE NO NO NO
Fuel Oil Storage (933)	١	Above	11,000	#2 Fuel Oil	No	IV - AA
Gasoline Storage (935)	2	Above	11,000	Gasoline	Yes	Yes T
Fuel Oil Storage	۱	Above	17,000	Gasoline	Yes	Yes

### TABLE IV-A (Cont'd) PETRGLEUM-TYPE PRODUCTS

LOCATION	NUMBER OF TANKS	(a) ABOVE GROUND BELOW GROUND	(b) CAPACITY GALLONS	(c) PRODUCT STORED	(d) DIKED	(e) EVAPORATION
Road Oil Storage (937)	1	Above	52,000	Road Oil	No	No
Storage Tank (305)	2 1	Below Below	2,000 1,000	Gasoline White Gas	N/A N/A	No No
Magazine Gas Tank (938)	1	Below	3,000	Gasoline	N/A	No
Magazine Fuel Oil Tank (1993-1	1 )	Below	3,000	Fuel Oil	N/A	No
Tractor Garage Rocket (6529)	2	Below	700	Gasoline	N/A	No
Tractor Garage Rocket (6529)	١	Below	500	Waste Gil	N/A	No
Powerhouse #2 (6538)	2	Below	14,000	#2 Fuel Oil	N/A	Yes
Rocket Area Tram Shop (6586-1)	1	Below	500	Gasoline	N/A	No
Rocket Area Shop (6822)	1	Below	300	Gasoline	N/A	No
Garage 241-1	1	Below	11,500	Gasoline	N/A	Yes
Garage 241-1	2	Below	1,000	Gasoline	N/A	NO TAB
Garage 241-1	3	Below	2,000	Diesel	N/A	BADGER TOTAL P TABLE I № 20
Garage 241-1	1	Below	2,000	White Gas	N/A	NO N
Garage 241-1	1	Below	1,000	Waste Oil	N/A	No E

.

#### BADGER AAP TOTAL PLANT OPERATIONS - EA EXHIBITS

### ENVIRONMENTAL ASSESSMENT

### FOR

### TOTAL PLANT OPERATIONS

Exhibit No.	Description
I-A	Military Construction Project, MCA Project No. MO0400, Explosive Waste Incinerator (EWI)
I-B	Military Construction Project, MCA Project No. M1300, Old Acid Liquid Waste Treatment - Water Pollution Control
I-C	Military Construction Project, MCA Project No. M1400, B & C Nitrocellulose Lines Liquid Waste Treatment - Water Pollution Control
I-D	Military Construction Project, MCA Project No. M1500, D & E Nitrocellulose Lines Liquid Waste Treatment - Water Pollution Control
I-E	Military Construction Project, MCA Project No. M1700, Nitroglycerin Liquid Waste Treat- ment - Water Pollution Control
I-F	Military Construction Project, MCA Project No. MO1800, Reline Effluent Ditches and Ponds
I-G	Military Construction Project, MCA Project No. MO2500, BALL POWDER Wastewater Facility
I-H	Military Construction Project, MCA Project No. TO2600, Close Existing/Open New Land- fill - Solid Waste
I-I	Military Construction Project, MCA Project No. T02800, Convert Powerhouse No. 1 to Coal
I–J	Military Construction Project, MCA Project No. T03600, Old Acid Mist/Vapor
I-K	Military Construction Project, MCA Project No. T03700, Old Oleum Liquid Waste Treat- ment

#### BADGER AAP TOTAL PLANT OPERATIONS - EA EXHIBITS

### ENVIRONMENTAL ASSESSMENT

### FOR

## TOTAL PLANT OPERATIONS

Exhibit No.	Description
I-L	Military Construction Project, MCA Project No. T03800, NO <sub>X</sub> & SO <sub>X</sub> Abatement Old Acid
I-M	Military Construction Project, MCA Project No. T04200, Solvent Conservation B Line
I-N	Military Construction Project, MCA Project No. T04300, Solvent Conservation C Line
I-0	Military Construction Project, MCA Project No. T04400, Solvent Conservation D Line
I-P	Military Construction Project, MCA Project No. T04700, Solvent Conservation E Line
I-Q	Military Construction Project, MCA Project No. TO4900, Solvent Conservation BALL POWDER
I-R	Military Construction Project, MCA Project No. T05000, Old Acid Lime Silo and Feeders
I-S	Military Construction Project, MCA Project No. T05100, Old Acid Tank Farm Diking
I-T	Military Construction Project, MCA Project No. T05400, Tank Car Cleaning - Old Acid
I-U	Military Construction Project, MCA Project No. T05600, Modernize Powerhouse No. 2
II-A	Environmental Projects, Project No. TB-E-81-01, Develop Methods for Treatment and Disposal of Pollutant Contaminated Sludge/Sediment Deposits
II-B	Environmental Projects, Project No. TBW-E-80-2A, Divert Storm Water at Badger AAP to Off-Plant Drainage Systems: Part I - Preliminary Concept Design

.

#### BADGER AAP TOTAL PLANT OPERATIONS - EA EXHIBITS

#### ENVIRONMENTAL ASSESSMENT

#### FOR

#### TOTAL PLANT OPERATIONS

#### Exhibit No. Description II-C Environmental Projects, Project No. TBTW-E-82-08, Evaluate Treatment Technology to Remove Phthalate Esters and Amines from Wastewater Streams II-D Environmental Projects, Project No. TBW-E-83-05, Diversion of Off-Site Generated Storm Water from the Thermal Treatment (Open Burning) Sites at the **Burning Grounds** II-E Environmental Projects, Project No. TBW-E-82-04, Removal of Accumulated Sludge and Neutralized Acid from the Pond Near the New Acid Complex Environmental Projects, Project No. II-F TB-E-81-02, BALL POWDER Wastewater Pollution Abatement Study II-G Environmental Projects, Project No. TBTW-E-82-07, Conduct a Study for Monitoring DNT, DPA, Phthalate Esters and Nitrosoamines in Wastewater Streams II-H Environmental Projects, Project No. TBA-E-83-03, Scrubbing of Nitroglycerin Vapors II-I Environmental Projects, Project No. TBW-E-82-11, Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Nitrocellulose Area II-J Environmental Projects, Project No. TBW-E-82-10, Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the BALL POWDER Area

BADGER AAP TOTAL PLANT OPERATIONS - EA EXHIBITS

#### ENVIRONMENTAL ASSESSMENT

#### FOR

#### TOTAL PLANT OPERATIONS

#### Description

II-K

II-0

Exhibit No.

Environmental Projects, Project No. TBW-E-82-09, Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Single Base Manufacturing Areas

II-L Environmental Projects, Project No. TBW-E-82-12, Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Old Acid Complex

II-M Environmental Projects, Project No. TBW-E-82-01, Installation of Impermeable Membrane on the Ground within the Acid Storage Diked Areas

II-N Environmental Projects, Project No. TBW-E-82-04, Upgrade Laboratory Capability for WPDES Water Monitoring Compliance

Environmental Projects, Project No. TBW-E-83-02, Develop a Combined Treatment System for the Reduction of Nitrates, BOD's and COD's from the Nitrocellulose and BALL POWDER Production Areas

II-P Environmental Projects, Project No. TBH-E-82-13, Excavate and Reline Existing Nitroglycerin Pond

II-Q Environmental Projects, Project No. TBA-E-82-06, Install Stack Gas Monitoring Equipment in Powerhouse No. 1

II-R Environmental Projects, Project No. TB-E-80-8, Conduct a Hazardous Materials and Pesticide Management/Control Study

# EXHIBIT I-A

21

BADGER AAP ENVIRONMENTAL ASSESSMENT

FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

	۲ ۱۳		( # / [	UATA (A		201			
1. COMPONENT	FY 19	MILITARY CONST	RUCTI	ON PRO	JECT (			2. DA	
ARMY									SEP 82
3. INSTALLATION Badger Army A				4. PROJEC	ST TITLI	E UO	01161	oup	1
Visconsin		ION FIGHT		INCINE	RATOR	ETP	1.0511		ASTE
S. PROGRAM ELEN	ENT	6. CATEGORY CODE	7. PROJE	ECT NUMB		_	DJECT		
		\$33 10							
		9. COST	ESTIMA	res					
		ITEM		U/M	QUAN	TITY	UNI COS		COST (\$000)
PRIMARY FACIL									
CONSTRUCT I				LS					
SUPPORTING FA				LS					
BULLOUT THE									
								1	
. •s									
SUBTOTAL									
CONTINGENCY P	FRCENT	. (18.00%)							
TOTAL CONTRAC								l	
	_	Chead ( 5.00%)						1	
TOTAL REQUEST								1	
INSTALLED EQU	IPMENT	-OTHER APPROP							
CONSTRUCT AN AND EIPLOSIVE on the deacti preparations, fencing. Incl	INCINE S (CLA VATION VATER INERATO GROUN	SED CONSTRUCTION ERATION FACILITY CA ASSES 1.1 AND 1.3). FURNACE USED AT T I LINES, ELECTRIC S OR TO BE LOCATED IN IDS. SPACE IS AVAIL FURE.	DESIC COOELE Service I gener	N OF IN Army de , lands al arej	ICINER Pot. Icapin Of P	ATOR Proj G , Rese	SHAI ECT And S NT EI	L B Incl Secui KPLO	E BASED UDES SITE Rity Sive
11. REQUIREME	NT:	TN ADEQU	ATE:		TN	SU	BSTD:		TN
·				•					
PROJECT : Construct an and explosive		ERATION FACILITY CA	PABLE	OF DEST	FROYIN	IG VA	STE 1	PROP	ELLANT
REGUIREMENT The Current ( And Local Rec	DPEN BU	URNING INCINERATION Ents.	I DOES	NOT HEI	T CUR	RENT	fedi	ERAL	, STATE
OPEN BURNING MEET CURRENT	L PROPI	: Ellant and Eiflosiv Controlled Bituatio Ards Contained in ( D Part 74, Title 40	N. THE	S METHO Ral reg	D OF	DI 5 P 1 - 1 3 2	05AL	. DOE 15 M	S NOT Arch
DD FORM 1391		PREVIOUS EDITIONS N			INALLY				
1 DEC 76	F	UNTIL E	KHAUSTE ' (WIIEN		ENTER	EDI		PA	GE NO.
	• · ·								

		RAI	DGER AAP	
			VIRONMENTAL ASSES	CME
1. COMPONENT	1	EN	2. DATE	SME
I. COMPONENT	FY 19 MILITARY CONST	PUCTION PROJECT DAT		
ARMY	FT 15_MILLIANT CONST		IL SEP 8	2
	N AND LOCATION			
Badger Army Visconsin	Ammunition Plant			
	publication Group 1		5. PROJECT NUMB	5D
4. PROJECT TIT			S. FROJECT NUMB	ic n
INCINERATOR	EIPLOSIVE WASTE			
			,	
	•			
CURRENT SITU	ATION :		(CONT).	
FUR OFEN BUR	NING OF EXPLOSIVES.			
			ι,	. *
IMPACT IF NO	T FROVIDED :			
IF THIS PROJ	ECT IS NOT APPROVED, SAA	P WILL NOT BE IN COMP	LIACE WITH	
PROVISIONS O	F THE CLEAN AIR ACT OF 1			
NOBILIZATION	PROJECT.			
NATO INFRAST	RUCTURE CATEGORY			
	RUCTURE CATEGORY : Of present assets is inv	OLVED IN THIS PROJECT	THIS PROJECT H	AS
NO DISPOSAL	OF PRESENT ASSETS IS INV			
NO DISPOBAL Been Reviewe		D COMPLIES WITH THE I	NTENT OF PL 87-4	55
NO DISPOBAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED	NTENT OF PL 89-6 For environment	55
NO DISPOBAL Been Reviewe And Executiv Impact and C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED	NTENT OF PL 89-6 For environment	55
NO DISPOSAL Been Reviewe And Elecutiv Impact and C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED	NTENT OF PL 89-6 For environment	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED.	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED Of PL 91-190. An Envi	NTENT OF PL 89-6 For environment	55
NO DISPOBAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED	NTENT OF PL 89-6 For environment	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM	NTENT OF PL 89-6 For environment	55
NO DISPOSAL Been Reviewe And Elecutiv Impact and C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM	NTENT OF PL 87-43 For environment Ronmental impact	55
NO DISPOBAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM	NTENT OF PL 87-43 For environment Ronmental impact	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM	NTENT OF PL 87-43 For environment Ronmental impact	55
NO DISPOBAL Been Reviewe And Elecutiv Impact and C Statement IS	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM Ommander's Representa	NTENT OF PL 87-4 For environment Ronmental impact	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV Impact and C Statement is Estimated co	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM Ommander's Representa	NTENT OF PL 87-43 FOR ENVIRONMENT Ronmental impact Tive Indei: 1710	55
NO DISPOSAL BEEN REVIEWE AND EIECUTIV IMPACT AND C Statement is Estimated co Estimated MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM Ommander's Representa APRIL 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55
NO DISPOSAL BEEN REVIEWE AND EXECUTIV IMPACT AND C STATEMENT IS ESTIMATED CO ESTIMATED MI	OF PRESENT ASSETS IS INV D FOR HISTORIC IMPACT AN E ORDER 11593. THIS PROJ OMPLIES WITH THE INTENT NOT REQUIRED. /S/ D D C NSTRUCTION START: DPOINT OF CONSTRUCTION:	D COMPLIES WITH THE I ECT HAS BEEN REVIEWED OF PL 91-190. AN ENVI AVID C. FORDHAM AVID C. FORDHAM OMMANDER'S REPRESENTA APRIL 1788 OCTOBER 1988	NTENT OF PL 87-43 FOR ENVIRONMENT RONMENTAL IMPACT TIVE INDEX: 1710 INDEX: 1748	55

1. COMPONENT ARMY 3. INSTALLATION A Badger Army Am Visconsin 5. PROGRAM ELEME PRIMARY FACILIT WATER TREATME SUPPORTING FACIL	aunition Plant	CODE	RUCTI	··	JECT D	ATA Nob	21	ATE DFC 82
ARMY 3. INSTALLATION A Badger Army Am Visconsin 5. PROGRAM ELEME PRIMARY FACILIT WATER TREATME SUPPORTING FACI	ND LOCATION aunition Plant INT 6. CATEGORY	CODE		4. PROJEC Moderni	T TITLE	Hob	21	DFC 82
ARMY 3. INSTALLATION A Badger Army Am Visconsin 5. PROGRAM ELEME PRIMARY FACILIT WATER TREATME SUPPORTING FACI	ND LOCATION aunition Plant INT 6. CATEGORY	CODE		4. PROJEC Moderni	T TITLE	Hob	21	
Badger Army Am Visconsin 5. PROGRAM ELEME PRIMARY FACILIT WATER TREATME SUPPORTING FACI	NT 6. CATEGORY			Noderni			I C T O NO	
Visconsin 5. program Eleme Primary facilit Water treatme Supporting faci	NT 6. CATEGORY				zatio		1101040	2
5. PROGRAM ELEME PRIMARY FACILIT WATER TREATME SUPPORTING FACI			7, PROJE	OLD AC			~	
PRIMARY FACILIT WATER TREATME SUPPORTING FACI			I V. PROJE	OT AN INAD			L JECT COS	T (2000)
WATER TREATME SUPPORTING FAC	831 9	0				8. FRU		1 (2000)
WATER TREATME Supporting FAC					1			
WATER TREATME Supporting FAC		9. COS1	L ESTIMAT	'ES				
WATER TREATME Supporting FAC	ITEM			U/M	QUANT	174	UNIT	COST
WATER TREATME Supporting FAC					GOAN		COST	(\$000)
SUPPORTING FACT				LS				1
				63				-
				LS				1
								1
						ł		
						·		
SUBTOTAL								
CONTINGENCY PER	CENT (10.00%)							
TOTAL CONTRACT								
SUPERVISION INS	SP & OHEAD ( 5.	00%)				- 1		
TOTAL REQUEST						- 1		
INSTALLED EQUIP	MENT-OTHER APPR	lop -						
	PROPOSED CONSTRUC		TANT			ETM .		IVF
	ILFATES FROM THE							
	ON SHALL INCLUDE							
	TANKS, PUMPS, BUI							UPPORT
FACILITIES. PRO	OVIDE FACILITIES	5 FOR REG	CYCLING	TREAT	ED WAT	ER.		
					KG	CILD	STD:	KG
11. REQUIREMENT		, ADEQUI	N15:		, AU	300	510.	AU
PROJECT :								
PROVIDE ACID LI	QUID WASTE TREA	THENT F	CILITI	ES.				
				•				
REQUIREMENT :	S REQUIRED TO IN			****	. TYEN	+ 1 V	FVIGTI	
	JECT IS REQUIRE							
	STE VATER GENER							
	WATER POLLUTIO							
	FACILITY MODER							
COMPLETE BY MOE	IILIZATION.				-			
****								
CURRENT SITUATI There are no fi	IUN : NCILITIES CURREN	TLY FY19	STING T	O REMO	E NIT	RATE	S & SUI	FATES
FROM WASTE WATE	•	DAIS						<b></b> -
				•		•		

. .

FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1. COMPONENT					2. DA1	E
ARMY	FY 19 <u>90 MILITARY CON</u>	ISTRUC	FION PROJE	CT DATA		DEC 82
	NAND LOCATION					:
Badger Army An Wisconsin	mmunition Plant					
	Eilization Group 2				5. PROJECT	NUMBER
Modernization						
OLD ACID LWT	-VPC			l		
i						
						-
IMPACT IF NOT	PROVIDED : CT IS NOT APPROVED, BAI		P VIII NOT	RE IN CO	MPITANCE	VITH
	TE WATER POLLUTION REG					
PRODUCTION.						
NATO INFRASTR	UCTURE CATEGORY :					
	F PRESENT ASSETS IS IN	NVOLVED	IN THIS P	ROJECT. 7	THIS PROJ	ECT HAS
	FOR HISTORIC IMPACT					
	ORDER 11593. THIS PRO Mplies with the intent					
	REQUIRED. THIS IS A GE					
ON A FY85 BAS	IS.					
	· · · · ·					
	151	DAVID	. FORDHAM			
			C. FORDHAM			
		GS-13	DER'S REPR	FEENTATIN	/5	
		COMIAN	JER 3 REFR	GSENIAII		
	STRUCTION START:				INDEX:	
	POINT OF CONSTRUCTION:	APRIL	1990 October	1990	INDEX:	
	STRUCTION COMPLETION:	•	APRIL	1991	INDEX:	1950
	· · · · ·					· ·
	•					

EXHIBIT I-C EXHIBIT I-C

	OR OFFICIAL USE ONL	Y (WHEN	DATA IS	ENTER	(ED)			
1. COMPONENT							2. DA	TE
	MILITARY CONST	TRUCTI	ON PRO	JECT I	DATA	۹ ا		
ARMY 3. INSTALLATION AND LO							12	DEC 82
			4. PROJE	CTTHL	E Mol	bilG:	roup	2
Badger Army Ammunit Visconsin	ion Plant		<b>D</b> e C	*****			e 11 <i>2</i>	T - VFC
5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJE	CT NUMB					(\$000)
			•					
·	831 90							
	9. COS	TESTIMA	res					
	ITEM		U/M	QUAN	TITY		IIT ST	COST (\$000)
PRIMARY FACILITY								
WATER TREATMENT U	NIT		LS					
SUPPORTING FACILITY								
SUPPORT FACILITIE	S		LS					
2				ł				
J			1					
				[				
				ļ				
SUBTOTAL								
CONTINGENCY PERCENT TOTAL CONTRACT COST								
SUPERVISION INSP &								
TOTAL REQUEST								
INSTALLED EQUIPMENT	-OTHER APPROP							
10. DESCRIPTION OF PROPO	SED CONSTRUCTION							
DESIGN AND INSTALL								
NITROCELLULOSE MANU Include process tan								
WATER RECYCLE EQUIP								
EQUIPMENT.								
					<i>(</i> )			<u> </u>
11. REQUIREMENT:	GA ADEQU	ATE:		GX	501	BSTD	•	GX
PROJECT :								
PROVIDE NITROCELLUL	OSE MANUFACTURING	LIQUID	WASTE '	TREAT	MENT	EYC	ILIT	IES.
BEOULDENEN -								
REQUIREMENT : This project is req	VIRED TO PROVIDE F	ACILITI	ES FOP	VIST	E VI	TER '	TRE 1.	THENT
THAT WILL ASSURE CO								
OPERATING B & C NIT								IS
REQUIRED TO ASSURE	BADGER AAP WILL BE	IN COM	IPL I ANC	E VHEI	н тні	ESE I	LINES	3 ARE
REACTIVATED.				·				
Δ.						•		
CURRENT SITUATION :	•							
THERE ARE NO FACILI		STING 7	O REMO	VE NI	TRAT	ES 4	SVL	FATES
FROM VASTE VATER. P	RESENT VASTE VATER	TREATH	IENT PR	OVIDE	S ONI	LY P	K C01	NTROL AND
THIS IS NOT SUFFICE	ENT TO MEET THE LA	ν.			•			
L	PREVIOUS EDITIONS	AAV RE US						

DD 1 DEC 76 1391

	• • • • • • • • • • • • • • • • • • •		·	
1. COMPONENT				2. DATE
ARMY	FY 19 <u>90 MILITARY CON</u>	ISTRUCTION PROJI	ECT DATA	22 DEC 82
	NAND LOCATION			
	mmunition Plant			
Visconsin 4. PROJECT TIME	Bilisation Group 2			, PROJECT NUMBER
B & C NITROCE	LLULOSE LVT - VPC			· 
				,
IMPACT IF NOT				
	CT IS NOT APPROVED, BA TE VATER POLLUTION RE(			
PRODUCTION.				
NATO INFRASTR	UCTURE CATEGORY :			
	F PRESENT ASSETS IS II	NVOLVED IN THIS P	ROJECT. TH	IS PROJECT HAS
	FOR HISTORIC IMPACT			
	ORDER 11593. THIS PRO Mplies with the intent			
	REQUIRED. THIS IS A GI			
ON & FY85 BAS	IS.			
			-	•
				•
	151	DAVID C. FORDHAM	<b>1</b>	
	- -	DAVID C. FORDHAM	l	
		GS-13 Commander's Repr	FEFUTATIVE	
		COMMENDER DIREM		
ESTIMATED CON	STRUCTION START:		,	INDEX: 1867
	POINT OF CONSTRUCTION			
	STRUCTION COMPLETION:			
		• •		
		· .		
		•		
				· · · · ·
				~
			•	

# RADCED AAD

	F	OR OFFICIAL U	EXHIB ISE ONLY	IT I-D	DATA IS	E	NVIRC R <i>ED</i> J		AL ASSE	SSMENT
1. COMPONENT								2.	DATE	
	FY 19	MILITARY	CONST	RUCTI	ON PRO	JECT	DATA			
ARMY					•				2 DEC	92
3. INSTALLATION					4. PROJE	CT TITL	E Mob	ilGrou	ip Z	1
Badger Army An Visconsin	ERUNIC.	ion Plant			nsr	NITRO	CELLU	TASE	WT -VP	- l
5. PROGRAM ELEM	ENT	6. CATEGORY C	ODE	7. PROJ	ECT NUMB		the second s		ST (5000)	<u> </u>
										1
		831.70		<u> </u>						
			9. COS1	ESTIMA	res	1	r			
		ITEM			U/M	QUAN	ITITY	COST	CO: (\$00	
PRIMARY FACIL						1			l	
WATER TREAT					LS					
SUPPORT FAC		•			LS					1
		-			1					
									ł	
		•					1			
		•								
										1
SUBTOTAL										1
CONTINGENCY PI										l
TOTAL CONTRAC							1			
SUPERVISION IN TOTAL REQUEST	asr e	UNEAU ( J.)								
INSTALLED EQU	IPMENT	-OTHER APPRO	)P			[				
10. DESCRIPTION O										
DESIGN AND IN NITROCELLULOS Include proce Water Recycle Equipment.	E MANU SS TAN	FACTURING AF KS, PUMPS, S	REA WAS' Suspend	TE VAT Ed hat	ER STRE TER FIL	AMS. TRATI	FACIL On Ec	ITY 5 NIPHE	HALL NT, TRE	
11. REQUIREMEN	NT:	GA	ADEQU.	ATE:		GA	SUI	ISTD:	GA	
PROJECT : PROVIDE NITRO REQUIREMENT : This project That Vill Asso Operating D 4	IS REQ Ure co	UIRED TO PRO Mpliance VI	OVIDE F Th Fede	ACILIT RAL AN	LES FOI D State	L WAST : Regu	ILATIC	FER TR	eathent En	
OPERATING D E Required to A Reactivated.										
CURRENT SITUAT THERE ARE NO FROM VASTE VA	FACILI Ter. P	RESENT' VAST	E VATER	TREAT						
THIS IS NOT S	VEEICI	LNT TO REET	INE LA	₩.						

DD FORM 1391

1. COMPONENT					20	ATE
F	Y 19.90MILITARY CON	ISTRUCT	ION PROJE			
ARMY 3. INSTALLATION A	ND 1 0047101	<u>.</u>	<u> </u>			2. DEC _82
Badger Army Amm						
Wisconsin						
4. PROJECT TITLE i	lization Group 2				5. PROJE	CT NUMBER
D & E NITROCELLU	ULOSE LWT -VPC					
IMPACT IF NOT PI	ROVIDED					
	IS NOT APPROVED, BAN Water Pollution Reg					CE WITH
	PRESENT ASSETS IS IN DR HISTORIC IMPACT D	ND COMP	LIES WITH	THE INT	ENT OF	PL 89-655
AND EXECUTIVE OF Impact and compe	IES WITH THE INTENT DVIRED. THIS IS A GI	r of pl	91-190. A	N ENVIRO	NMENTAL	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DVIRED. THIS IS A GI	r of pl	91-190. A	N ENVIRO	NMENTAL	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DVIRED. THIS IS A GI	r of pl	91-190. A	N ENVIRO	NMENTAL	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DUIRED. THIS IS A GI	T OF PL Roup 2 m	91-190. A	N ENVIRO On proje	NMENTAL	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DUIRED. THIS IS A GI	T OF PL Roup 2 m David C David C	91–190. A Obilizati	N ENVIRO On Proje	NMENTAL	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DUIRED. THIS IS A GI	DAVID C DAVID C DAVID C GS-13	91–190. A Obilizati . Fordham . Fordham	N ENVIRO	NMENTAL CT. COST	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DUIRED. THIS IS A GI	DAVID C DAVID C DAVID C GS-13	91–190. A Obilizati . Fordham	N ENVIRO	NMENTAL CT. COST	IMPACT
AND EXECUTIVE OF Impact and compe Statement is red	IES WITH THE INTENT DUIRED. THIS IS A GI	DAVID C DAVID C DAVID C GS-13	91–190. A Obilizati . Fordham . Fordham	N ENVIRO	NMENTAL CT. COST	IMPACT
AND EXECUTIVE OF Impact and compl Statement is reg on a fys5 basis.	IES WITH THE INTENT DUIRED. THIS IS A GI /S/	DAVID C DAVID C DAVID C GS-13 COMMAND	91-190. A Obilizati . Fordham . Fordham ER'5 REPR	N ENVIRO On proje Esentativ	NMENTAL CT. COST	IMPACT I data is
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS.	IES WITH THE INTENT DUIRED. THIS IS A GI	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A Obilizati . Fordham . Fordham ER'5 REPR	N ENVIRO On proje Esentativ	NMENTAL CT. COST Ve Indej	IMPACT
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UIRED. THIS IS A GI (5/	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A Obilizati . Fordham . Fordham ER'S Repr 1990	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT I DATA IS I DATA IS
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REC ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908
AND EXECUTIVE OF IMPACT AND COMPL STATEMENT IS REG ON A FY85 BASIS. ESTIMATED CONSTR ESTIMATED MIDPOI	UCTION START: NT OF CONSTRUCTION :	DAVID C DAVID C DAVID C GS-13 COMMAND APRIL	91-190. A OBILIZATI . FORDHAM . FORDHAM ER'S REPR 1990 October	N ENVIRO On proje Esentativ 1990	NMENTAL CT. COS Ve Indej Indej	IMPACT F DATA IS (: 1867 (: 1908

1 DEC 76 1391C

UNTIL EXHAUSTED

	EXH	ΙB	IT	I-E	

1. COMPONENT		OR OFFICIAL USE ONLY				1:	2. DATE
ARMY	FY 19	MILITARY CONST	ructi	ON PRO	JECT DAT	A	
3. INSTALLATION	AND LOC	ATION		4. PROJE	CT TITLE NO	bilGr	<u>12 DEC 82</u> oup 2
Badger Army A	mmunit	ion Plant					
Visconsin 5. PROGRAM ELEM	IENT	6. CATEGORY CODE	7. PROJ	LNITRO	ER 8. PF		VPC OST (\$000)
		831 90	[				
÷			r estima		r		r COST
		ITEM		U/M	QUANTITY	COS	
PRIMARY FACIL CONSTRUCT T SUPPORTING FA	REATHE			LS			
		ante da la construcción de la const La construcción de la construcción d				1	
SUBTOTAL							
CONTINGENCY P	ERCENT	(10.00%)					
TOTAL CONTRACT		OHEAD ( 5.00%)					
TOTAL REQUEST		UREAD ( J. UVW)		1			· .
INSTALLED EQU	IPHENT	-OTHER APPROP					
MANUFACTURING LINES; ETC.,T	AREA. O PROV	S FOR TREATING WAS This involves ing ide controlled Add o discharging into	TALLAT	ION OF Of Lime	TANKS, PI AND SODI	JMPS', I VM SU	TRANSFER LFIDE TO THI
11. REQUIREME	NT:	GA ADEQU	ATE:		GA SI	BSTD:	GA
PROJECT : Provide a Nit	ROGLYC	ERIN PRODUCTION FA	CILITY	LIQUI	VASTE TI	REATHE	NT FACILITY
		ES MEANS OF NEUTRA May be contained i		VASTE	WATER AN	D DEST	ROYING ANY
OPERATION IS Reports from Resulting fro	T, THE DISCHA USAEHA M THIS	VASTE VATER FROM RGED INTO A LANDLO Indicate that the Vater Percolating Aste vater must be	CKED P RE IS Into	OND VIT Contam The Uni	THOUT TREA Ination of Derlying 9	ATHENT F THE Strata	RECENT GROUND . Hence, IT
DD FORM 1391		PREVIOUS EDITIONS N UNTIL E				-	PAGE NO.

FOR OFFICIAL USE ONLY (WITEN DATA IS ENTERED)

(

• · · · · ·	
1. COMPONENT	2. DATE
FY 19 <u>10</u> MILITARY CONSTRUCTION PROJECT DATA	
ARMY 3. INSTALLATION AND LOCATION	<u>1 22 DEC 82</u>
Badger Army Ammunition Plant	
Visconsin	
4. PROJECT TIRbBilization Group 2	5. PROJECT NUMBER
NITROGLYCERIN LWT - WPC	
IF THIS PROJECT IS NOT APPROVED, THE GROUND WILL CONTINUE TO CONTAMINATION DURING PERIODS WHEN NITROGLYCERIN IS MANUFACTU NATO INFRASTRUCTURE CATEGORY : NO DISPOSAL OF PRESENT ASSETS IS INVOLVED IN THIS PROJECT. T BEEN REVIEWED FOR HISTORIC IMPACT AND COMPLIES WITH THE INTE AND EXECUTIVE ORDER 11593. THIS PROJECT HAS BEEN REVIEWED FO IMPACT AND COMPLIES WITH THE INTENT OF PL 91-190. AN ENVIRON STATEMENT IS REQUIRED. THIS IS A GROUP 2 MOBILIZATION PROJEC ON A FY85 BASIS.	IRED THIS FROJECT HAS INT OF PL 89-653 DR ENVIRONMENTAL IMENTAL IMPACT
ISI DAVID C. FORDHAM	
ISI DAVID C. FORDHAM David C. Fordham	
/S/ DAVID C. FORDHAM David C. Fordham G5-13	76
ISI DAVID C. FORDHAM David C. Fordham	/E
/S/ DAVID C. FORDHAM David C. Fordham G5-13	7E
/S/ DAVID C. FORDHAM David C. Fordham G5-13	7E
/S/ DAVID C. FORDHAM David C. Fordham G5-13	YE INDEX: 1867 INDEX: 1908 INDEX: 1950
ISI DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908
/S/ DAVID C. FORDHAM DAVID C. FORDHAM GS-13 Commander's representativ Estimated construction start: April 1990 Estimated Midpoint of Construction: October 1990	INDEX: 1867 INDEX: 1908

	509 (	EX	HIBIT I-F				. ASSESSMEN
1. COMPONENT		MILITARY CON				2. 0	
ARMY 3. INSTALLATION AND Badger Army Amm Visconsin					TTITLE No	bilGroup	
5. PROGRAM ELEMEN	T 6. C	ATEGORY CODE	7. PROJ	ECT NUMB	ER S. PR	OJECT COST	
·		831 90	OST ESTIMA	TES			
				U/M	QUANTITY	UNIT	COST
PRIMARY FACILIT				0/10	QUANTITY	COST	(\$000)
EFFLUENT DITC Supporting faci	HES & P	SENC		LS			
						-	
		•					
SUBTOTAL Contingency per	CENT (1	).00%)					
TOTAL CONTRACT ( Supervision ins) Total request	COST						
INSTALLED EQUIP	MENT-OT	ER APPROP					
10. DESCRIPTION OF P EICAVATE EXISTIN ET, LANDSPREAD OF IMPERMEABLE ( LINER MUST EXTEN DITCHES AND POND	NG EFFLU The Remu Clay Cov ND 5 FT	IENT DITCHES DVED SEDIMENT Vered With 1	Γ, AND LI FT OF GR	NE THE	DITCHES V Protectivi	ITH A J E COVER.	FT LAYER The Clay
11. REQUIREMENG	GOTO 1	I.N LF ADEC	DUATE:	<u></u>	LF SUB	STD:	LF
REQUIREMENT : This project is Contain high ley State of Viscons	ELS OF						
IMPACT IF NOT PR IF THIS PROJECT VPDES REQUIREMEN IS INVOLVED IN T IMPACT AND COMPL	IS NOT (TS PRO. This pro	APPROVED, BI Vected for th Dject. This b	I <mark>e</mark> Future Project h	. NO DIS As been	SPOSAL OF REVIEWED	PRESENT FOR HIS	ASSETS TORICAL
-							
		•				· · ·	

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WIIEN DATA IS ENTERED)

	r		
1. COMPONENT	FY 19_44MILITARY CONSTRU		2. DATE
ARMY	FT ISMILIIANT CONSTRU	UTION PROJECT DATA	01 SEP 82
3. INSTALLATIO	NAND LOCATION		
Badger Army A Visconsin	mmunition Plant		
	pilisation Group 1		5. PROJECT NUMBER
EFFLUENT DITC	CHES & PONDS		
	•		
HAS BEEN REVI	EVED FOR ENVIRONMENTAL IMP	ACT AND COMPLIES WIT	HTHE INTENT OF PL
71-170 AND AR	200-1. THIS IS A GROUP I	MOBILIZATION PROJECT	•
		D C. FORDHAM	
<u>a</u>	DAVI	D C. FORDHAM	
	COM	ANDER'S REPRESENTATI	VE
ESTIMATED CON	STRUCTION START: APR	TT. 1984	INDEX: 1550
ESTIMATED MID	POINT OF CONSTRUCTION:	OCTOBER 1984	INDEX: 1402
ESTIMATED CON	STRUCTION COMPLETION:	APRIL 1987	INDEX: 1619
-			
	•	· · · ·	

# FYHIRIT I-G

BADGER AAP ENVIRONMENTAL ASSESSMENT

	111-0	LINYIKU
FFICIAL USE ONLY	WHEN DATA	IS ENTERED)

	F	OR OFFICIAL USE ON	LY (WHEN	DATA IS	ENTER	ED)			
1. COMPONENT								2. DA	TE
	FY 19	MILITARY CONS	STRUCT	ION PRO	JECT I	DAT	<b>A</b> .		
ARMY	<u> </u>								SEP 12
3. INSTALLATION				4. PROJE	CT TITL	E No	511G	roup	1
Badger Army A Visconsin	Innunit	ion Flant		DATE 0		UIC	TE U	1779	FACILITY
5. PROGRAM ELEN	AFNT	6. CATEGORY CODE	7 280	ECT NUMB					(\$000)
J. / 110011-11 222									
		831 13							
			ST ESTIMA	TES		L	1		
	· · · · · · · · · · · · · · · · · · ·	ITEM		U/M	QUAN	TITY	UNCO		COST (\$000)
PRIMARY FACIL		REATMENT FACILI		LS	1. 				
SUPPORTING F									
JULI DALLAG LA		•						1. A. A.	
								- I	
			· .						
an a th		• · · ·			l				
					}				
					Į				
SUBTOTAL Contingency 1	9 E 9 C E 11	F (18 88%)			[				-
TOTAL CONTRACT									
		OHEAD ( 5.00%)							
TOTAL REQUEST									
INSTALLED EQU	U I PMENT	C-OTHER APPROP							
		SED CONSTRUCTION			A				
		ES TO REMOVE AND (							
		DIUM SULFATE FOR		ND BIO-C	DIIDAT	'I ON	TREA	THEN	т то
TREAT WASTE	ATER E	OR B.O.D. & C.O.I	<b>D</b> .						
11. REQUIREM		1050	UNTE:			51	BSTD	•	
II, AGUVIAGA								•	
PROJECT :									
	LL POVI	DER VASTE VATER TI	REATHEN	T FACILI	TY.				
			1						
REQUIREMENT	-								
		UIRED TO REMOVE A Rate sodium sulfat							
		CATE SUDIUM SULFATE ER FOR B.O.D. & C	•						
LINITS.		un IVN 8.V. <i>V</i> . 4 6							
CURRENT SITU								<i>.</i>	
		WATER IS PARTIALL					STE	TREA	THENT
FACILITY, BUT	r this	IS NOT ADEQUATE	TO MEET	WPDES B	PERMIT	•			· · · · ·
									. /
		•	•			• .			
• •									

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

	••••••••••••••••••••••••••••••••••••••						
1. COMPONENT						2. DA	ΓE
ADAM	FY 19 <u>18</u> MIL	ITARY CONS	TRUCTI	ON PROJEC	T DATA		
ARMY 3. INSTALLATIO							SEP 82
Badger Army A	mmunition Pl	ant					
4. PROJECT TITLE	A.I.I	· · · · · ·				5 PROJEC	
4. PROJECT 1106	MILLERCION C	roup 1				0.110020	
BALL POWDER Y	ASTE WATER P	ACTLITY					
				•			
IMPACT IF NOT	FROVIDED :						
THE CONSTRUCT	TION OF A HUI	TI FACETED	UNIT T	D TREAT TH	E DIFFE	RENT POLL	UTANTS
IN THE BALL P	OVDER MANUFI	CTURING ARE	ÉA IS N	ECESSARY B	ECAUSE	WITHOUT I	т вууб
VILL EXCEED V	PDES LIMITS.	THIS IS A	GROUP	1 MOBILIZJ	TION PR	OJECT.	
							-
	· · · · · · · · · · · · · · · · · · ·						с. С. С. С.
NATO INFRASTR							
THIS PROJECT							VIRON
MENTAL IMPACT	STATEMENT I	URSUANT TO	PL 91-	190 IS NOT	REQUIR	ED.	
•							
				FORDHAM			1
		1	DYAID C	. FORDHAM			
		(	COMMAND	ER'S REPRI	SENTATI	VE	
		•					
		· . · ·					
ESTIMATED CON			APRIL			INDEX:	
ESTIMATED MI				OCTOBER		INDEX:	-
ESTIMATED CON	STRUCTION CO	OMPLETION:		APRIL	1989	INDEX:	1/56
						, , , ,	
						,	
						,	

•

EXHIBIT I-H ENVIE FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

÷

	F	OR OFFICIAL USE ONL	Y (WHEN	DATAIS	ENTER	(F.D)			
1. COMPONENT								2. DA	-
ARMY	FY 19	A6 MILITARY CONS	TRUCTI	ON PRO	JECT	DATA	<u>م</u>		JAN 83 Jan 83
3 INSTALLATION	AND LOC	ATION		4. PROJE	CT TITL	E Nol	bilGr		
BADGER ARMY AN	INUNITI	ON PLANT		Į					•
VISCONSIN 5. PROGRAM ELEM	ENT	A CATEGORY CODE	17.000	CLOST.			V NEW	COST	V2-11170
5. PROGRAM ELEM		6. CATEGORY CODE	7. PROJ		C N .	0. r n	03661	6031	(3000)
		871 90		TOZEC					
		9. COS	T ESTIMA	TES					
	•	ITEM		U/M	QUAN	TITY	UN COS		COST (\$000)
PRIMARY FACIL	LTY								
Close Exist	-	11		LS					
Open New Las SUPPORTING FAC				LS					
SUPPORTING PRO	-16113								
						•			
		<i>.</i> .							
·									
SUBTOTAL		· · · · · · · · · · · · · · · · · · ·							
CONTINGENCY PE Total Contract		(10.00%)							
SUPERVISION IN		HEAD ( 5.00%)							
TOTAL REQUEST									
INSTALLED EQUI					<u> </u>				
10. DESCRIPTION O	F PROPOS	ED CONSTRUCTION							
		5 20 ACRE LANDFILL Ranular Soil. 24							
OF TOP SOIL AN	O SEED	).							
	•	SANITARY LANDFILL							
2 ·		TECTIVE COVER OVE M. The new landfi						n 31	JILN AND
		WILL MEET THE REG NRISS SOLID WASTE			rhe. Vi	SCON	ISIN		· .
D. ACCESSAI Reasons.	BILITY	FOR THE HANDICAPP	ED IS P	NOT REGI	VIRED	FOR	FUNC	t I on	AL
11. REQUIREMEN	<b>IT:</b>	12 ac ADEQU	ATE:			SUE	STD:		20 20
		DVIDE A VISCONSIN D CLOSE EXISTING					RE50	URCE	5
		•	• •						
			•					· .	
				•					
L		الأكادار الأشتاذ فيبرون والمتعادين والمتعادين					_		

DD FORM 1391c

CURRENT SITUATION :

PAGE NO.

IMPACT IF NOT PROVIDED : IF THIS PROJECT IS NOT FUNDED AND CONSTRUCTION WORK COMPLETED WITH AN INDICATION OF PROGRESS IN THE INTERIM, BAAP COULD BE FORCED TO COMPLY WITH VDNR SPECIAL ORDER 2A-78-1194 TO CLOSE THE FACILITY. CLOSURE OF THIS SOLID WASTE LANDFILL SITE WOULD CAUSE THE CESSATION OF BARRICADE AND/OR BUILDING DEMOLITION PROJECT WORK SINCE ALL OF THE DEMOLITION DEBRIS IS CURRENTLY BEING DISPOSED OF IN THE EXISTING LANDFILL. SAUK COUNTY'S SOLID WASTE HANAGEMENT SITE, LOCATED APPROXIMATELY 18 MILES FROM BAAP, IS RAPIDLY FILLING WITH MUNICIPAL-TYPE GARBAGE AND INDUSTRIAL FIRMS ARE BEING ENCOURAGED TO FIND OTHER MEANS OF DISPOSAL.

SEFTEMBER 1976 PENDING A FINAL REVIEW OF A FEASIBILITY REPORT SUBMITTED 1 MAY 1979. A SPECIAL ORDER NO. 2A-78-1194 WAS ISSUED BY THE VDNR, 20 SEPTEMBER 1978, REQUIRING THE PREPARATION OF THE FEASIBILITY REPORT AND PROVIDING EITHER AN ACCEPTABLE ABANDONMENT PLAN OR CONTINUED OPERATIONS PLAN BY 1 FEBRUARY 1980 WITH ACTUAL ABANDONMENT OR BRINGING THE SITE INTO COMPLIANCE BY I DECEMBER 1980. ALTHOUGH THERE HAS BEEN A SLIPPAGE OF INDICATED COMPLIANCE DATES, THE WONR ORDER TO BAAP STILL STANDS. IN THE INTERIM PERIOD UNTIL 1986, IT IS PLANNED TO CONTINUE OPERATIONS AT THE EXISTING LANDFILL IN A MANNER SO AS TO MINIMIZE CONTAMINATION IN COORDINATION WITH VONR.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR) LICENSE NO 2813 DATED 28

THE SOLID WASTE DISPOSAL SITE CONTINUES TO BE USED UNDER A STATE OF

REQUIREMENT THE EXISTING LANDFILL IS SUBSTANDARD. THIS PROJECT IS REQUIRED TO MINIMIZE ECOLOGICAL IMPACT OF THE LEACHATE BEING DEVELOPED BY THE EXISTING LANDFILL. HIGH SPECIFIC CONDUCTANCE AND DISSOLVED IRON VALUES IN THE GROUNDWATER SAMPLES TAKEN FROM MONITORING WELLS DOWNGRADIENT OF THE LANDFILL INDICATE THAT THE LEACHATE IS ENTERING THE AQUIFER. CONTINUED USE OF THIS UNLINED LANDFILL THAT IS LOCATED OVER A VERY POROUS SUBSOIL COULD RESULT IN EXCESSIVE CONTAMINATION OF THE GROUNDWATER. BADGER AAP HAS RECEIVED SPECIAL ORDER NO. 2A-78-1194 REQUIRING THAT THE EXISTING LANDFILL BE CLOSED AND/OR ACCEPTABLE PLAN FOR CONTINUED OPERATION BE PROVIDED.

		ON AND LOCA	TION	
BADGER	ARMY	AMMUNITION	PLANT	
VISCONS	SIN	· .		

4. PROJECT TIMEBilization Group 1

CLOSE EXIST/OPEN NEW LANDFILL-SW

**1. COMPONENT** 2. DATE FY 19 MILITARY CONSTRUCTION PROJECT DATA ARMY

ENVIRONMENTAL ASSESSMENT

26 JAN 83

24 JAN 83

**5. PROJECT NUMBER** 

CT02600

BADGER AAP

#### BADGER AAP EXHIBIT I-I ENVIRONMENTAL ASSESSMENT OR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

		FOR OFFICIAL USE ONL	Y (WHEN	I DATA	IS ENT	EREDJ			
1. COMPONENT	FY 19	17 MILITARY CONST	BUCT		LIFOT	DAT	Δ	2.0/	ATE
ARMY							<u> </u>	01	SEP 82
3. INSTALLATION Badger Army A				4. PROJ		LE			
Visconsin		ION FIGNS				VERHO	USE	נ סא	TO COAL
S. PROGRAM ELEN	IENT	6. CATEGORY CODE	7. PROJE						(\$000)
l			, view of the second se						
	. <del>.</del>	821 20 9 COST	ESTIMAT			<u> </u>			
	- <u> </u>	ITEM	2311112	U/N		NTITY		IIT ST	COST (\$000)
PRIMARY FACIL	ITY								
CONVERT POW	ERHOUS	t .		LS					
SUPPORTING FA							[		
SITE PREPAR	ATION			LS					
1							l ·		
1									
1									
	7								
SUBTOTAL					1				
CONTINGENCY I Total Contrac									
		OHEAD ( 5.00%)							
TOTAL REQUEST							1		
The second se		-OTHER APPROP	<u>.</u>				L		
		ED CONSTRUCTION NG, COAL FIRING AN		UTION	19175	NENT	FOUT	PMEN	T ON S
		BOILERS, 175,000 L							
		MITED TO, EQUIPMEN							
		NDLING, REPLACE CO							
		OIL BURNERS, AIR Eichanger, Boiler							
EQUIPMENT. ST	A ALAL	ID FANS, ASH HANDE	ING SY	STEN,	CONTR	OLS	INST	RUME	NTATION
BUILDING MODI	FICATI	ON WILL BE NECESSA	RY. TH	E ELEC	TRIC	SVITO	H GE	AR,	
		D ELECTRIC LINES N	UST BE	RELOC	ATED	FOR 7	CHE P	OLLU	TION
ABATEMENT SYS	TEN.								
11. REQUIREME	INT:	MB ADEQU	ATE:	······································	И	B SU	BSTO	:	ME
PROJECT :									
	HANDLI	NG, COAL FIRING AN	D POLL	UTION	ABATE	MENT	EQUI	PMEN	TON S
EXISTING OIL									
			•			•			
REQUIREMENT	•								
THIS PROJECT	IS REQ	UIRED TO PROVIDE							
NOBILIZATION	PERIOD	S. CONVERSION MUST	BE YC	COMPLI	SHED	PRIO	t TO	FULL	NOB.
· ·									
1		••							
				•		,			
Į									

•

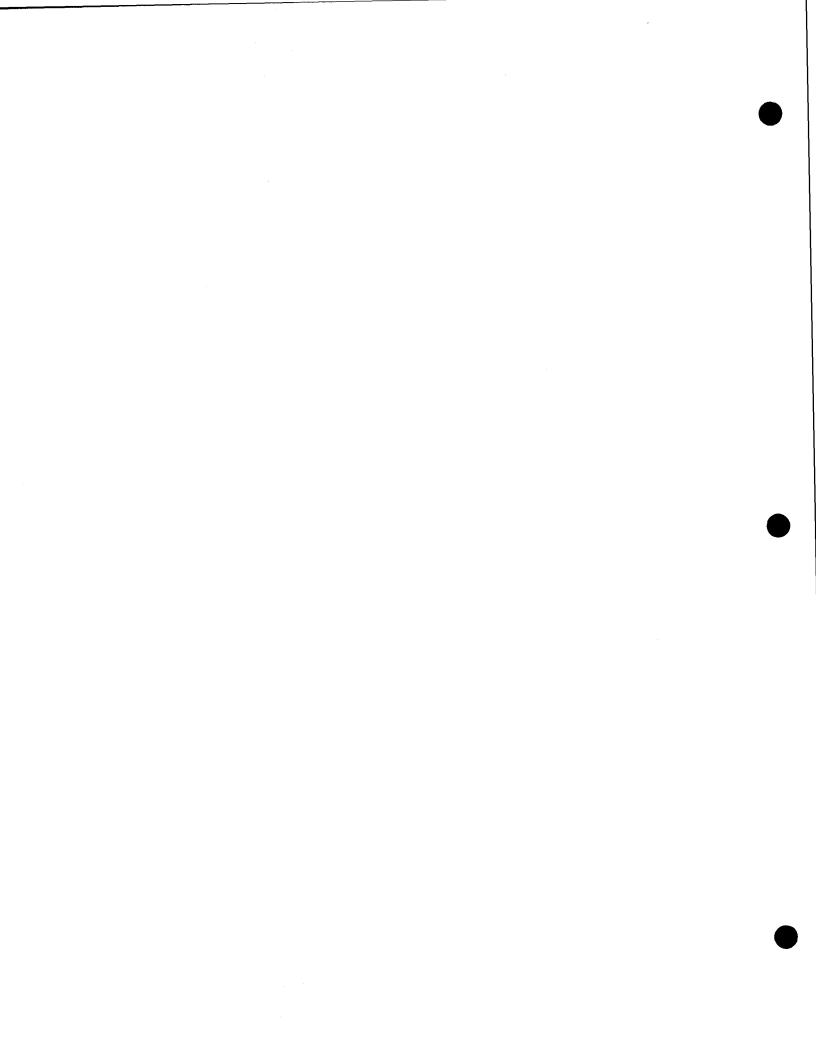
•			BADGER	
1. COMPONENT	7		ENVIRON	MENTAL ASSESSMEN
ARMY	FY 19.17 MILITARY CONST	<b>FRUCTION PROJE</b>	CT DATA	01 SEP 62
		· · · · · · · · · · · · · · · · · · ·		
	Ammunition Plant			
Visconsin				
4. PROJECT TITI	LE	······································		. PROJECT NUMBER
Conversion				
CONVERT POWE	RHOUSE NO 1 TO COAL			
		· .		
	•			
BECAUSE OF L	E BOILERS ARE OIL FIRED. ACK OF FUEL.	NVI ACENUVE	<u></u>	
REVIEWED FOR EXECUTIVE OR	/S/ D	PLIES WITH THE Has been review	INTENT OF Ed for env n environd	FL 87-655 AND IRONMENTAL
	c	OMMANDER'S REPR	ESENTATIVI	:
	· · · · · ·			
ESTIMATED MI	NSTRUCTION START: DPOINT OF CONSTRUCTION: NSTRUCTION COMPLETION:	APRIL 1967 October	1987	INDEX: 1619 INDEX: 1673
	ASTROCTION CONFERING.	APRIL	1788	INDEX: 1710
	ASTROCTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTROCTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTROCTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTROCTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTAULTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTAULTION CONFLETION.	APRIL	1788	INDEX: 1710
	ASTAULTION CONFLETION.	<b>APRIL</b>	1788	INDEX: 1710
	NJINUCIIUN CONFLETION.	APRIL	1788	INDET: 1710
	ASTAULTION CONFLETION.	APRIL	1788	INDEX: 1710
	NJINUCIIUN CUMPLETIUN.	APRIL	1788	INDEX: 1710
	NJINULIUN CONFLETION.	APRIL	1788	INDEX: 1710

٠

EXHIBIT I-J	ENV
FOR OFFICIAL USE ONLY (WIIEN DATA	IS ENTERED

• •

1. COMPONENT									2. DA	TE
ARMY	FY 19_	MILITA	ARY CONS	TRUCTI	ON PRO	JECT	DATA	<b>`</b>	85	JAN 83
3. INSTALLATION	AND LOCA	TION			4. PROJEC	TTITL	E Mot	) i I G R		
adger Army An	nmuniti	on Plant			Conver					
lisconsin				1	OLD AC					(0000)
5. PROGRAM ELEM	ENI	6. CATEGOR	IY CODE	7. PROJ	ECT NUMB	; <b>M</b>	8. PR	DJECT	CUST	(2000)
		226	12	1						
	F			TESTIMA	TES		L			
		ITEM			U/M	QUAN	τιτγ	UNI		COST (\$000)
RIMARY FACILI										
PURCHASE AND Supporting fac		LL			LS				Í	
SOLLOWING EXC										
UBTOTAL								:		
					i				- · · ·	
		(10.00%)								
TOTAL CONTRACT	COST									
CONTINGENCY PE COTAL CONTRACT SUPERVISION IN	COST									
TOTAL CONTRACT Supervision in Total request	COST	HEXD (	5.00%)							
OTAL CONTRACT	COST	HEAD ( Other Ap	5.00%) Prop							
TOTAL CONTRACT SUPERVISION IN TOTAL REQUEST INSTALLED EQUI 10. DESCRIPTION OF REMOVE EXISTIN	COST ISP & O PMENT- F PROPOS	HEAD ( OTHER AP ED CONSTRU	5.00%) PROP JCTION	NT AND	REPLACE	: VITI	ł MOR	LE EF	FICI	ENT
OTAL CONTRACT SUPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	5.00%) PROP JCTION		REPLACE	VITI		IE EF		ENT
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	S.00%) PROP JCTION OLEUM PLA		REPLACE					
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	S.00%) PROP JCTION OLEUM PLA		REPLACE					
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	S.00%) PROP JCTION OLEUM PLA		REPLACE					
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	S.00%) PROP JCTION OLEUM PLA		REPLACE					
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP Ed constru Ster At (	S.00%) PROP JCTION OLEUM PLA		REPLACE					
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA							
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA	ATE :						
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA	ATE :						
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :		SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :	······	SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :	······	SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :	······	SF	SUE	STD:		
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED EQUI 10. DESCRIPTION OF EMOVE EXISTIN NIT.	COST ISP & O PMENT- F PROPOSI G DEMI	HEAD ( OTHER AP ED CONSTRU STER AT (	S.00%) PROP JCTION OLEUM PLA SF ADEQU	ATE :	······	SF	SUE	STD:		



	-			SE UNLY	' 1W11EN	DATATS	EN I EKI	r.1))		
		OR OFFI								
1. COMPONENT	FY 19	<u>. 1</u> 7MILI	TARY	CONST	RUCTI	ON PRO	JECT D	ΑΤΑ	.	
3. INSTALLATION A	ND LOCA	ATION		<u>.</u>		4. PROJEC	TTITLE	Mah	IIGROU	<u>5 JAN 83</u> P 3
ladger Army Am Visconsin	muniti	ion Pla	nt			OLD OL				•
5. PROGRAM ELEME	NT	6. CATEC	SORY CO	DE	7. PROJ	ECT NUMB			JECT COS	T (\$000)
		8	31 90							_
				9. COST	ESTIMA	TES				·····
		ITEM				U/M	QUANT	rity	UNIT COST	COST (S000)
PRIMARY FACILI Construction Supporting fac						LS				
								- 1		1
UBTOTAL ONTINGENCY FE OTAL CONTRACT UPERVISION IN	COST			0%)						
ONTINGENCY PE	COST SP & C PMENT- PROPOS ADJUS	OHEAD OTHER ED CONS THENT	( 5.0) <u>Approi</u> Tructic Basin	P XN TO TRI	EAT VA	TER FOR	рн со	DNTRO	L BEFO	RE
CONTINGENCY PE COTAL CONTRACT SUPERVISION IN COTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF CONSTRUCT A PH	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) <u>Approi</u> Tructic Basin	P XN TO TRI		TER FOR	PH CO KG		STD:	RE XG
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT A PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				
ONTINGENCY PE OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 10. DESCRIPTION OF ONSTRUCT & PH ISCHARGING IN	COST SP & C Phent- Propos Adjus To rec	OHEAD OTHER ED CONS THENT	( 5.0) APPROI TRUCTIO BASIN POND	P N TO TRI		TER FOR				

•

• ,

ł

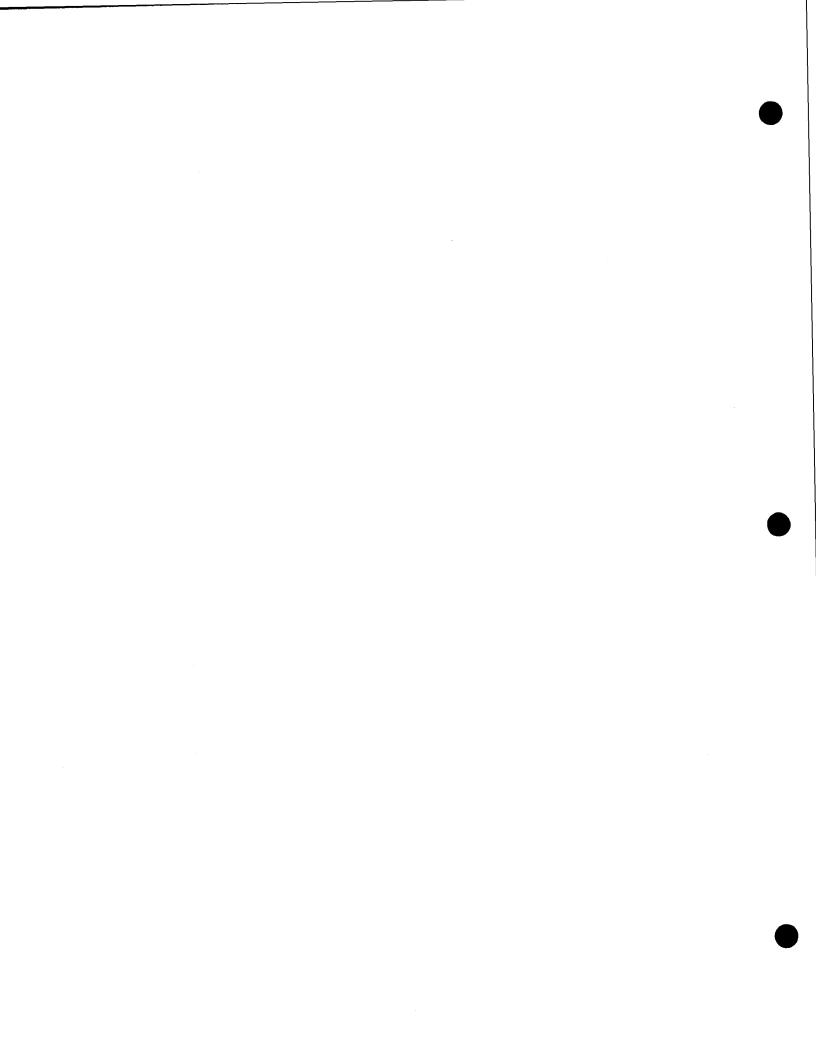


EXHIBIT I-L ENVI

	and the second se				DATA IS			_	_	
1. COMPONENT	EV 10	10 A411 IT	ARY CONST	יסווכדי			<u>אד</u> י		2. DA	TE
ARMY										<u>JAN 83</u>
3. INSTALLATION Badger Army An					4. PROJEC	TTITL	E Mob	IGRO	VP	3
Visconsin					NOX. SON					
5. PROGRAM ELEN	AENT	6. CATEGOR	RY CODE	7. PROJ	ECT NUMBE	R	8. PR	DJECTO	:OST	(\$000)
2017 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 -		226	12							
				ESTIMA	TES					
		ITEM			U/M	QUAN	τιτν	UNI		COST (\$000)
PRIMARY FACIL	ITY									
CONSTRUCTION Supporting fa	-				LS					
·										
SUBTOTAL Contingency Pi	FREENT	(10.00%)							·	
TOTAL CONTRACT										
SUPERVISION IN	NSP & C	HEAD (	5.00%)						- 1	
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE	FPROPOS BING SY	STENS FO	PROP JCTION R ALL NOI							
TOTAL REQUEST <u>INSTALLED EQUI</u> 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIC TRANSFER IT TO	FPROPOS BING SY FEM CON VEAX A ES EMIT GNED TO	STEMS FO STEMS FO ISISTING CID AND TED FROM RECIRCU	PROP JCTION R ALL NOI OF THREE AN OXIDIZI NINC AMMO LATE THE J	ABSORPT ER AS A DNIA OI ABSORPT	TION TOU BSORPTI LIDATION TION VAT	ERS U On Me Plan Er/ W	SING DIUM IT ST	A RE TO F Acks	CIR IEMO SY	CULATED Ve noi Stem
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIC TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP JCTION R ALL NOI OF THREE AN OXIDIZI NINC AMMO LATE THE J	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U On Me Plan Er/ W	SING DIUM T ST EAK	A RE TO F Acks	CIR IEMO SY	CULATED Ve noi Stem
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE GASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE GASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIC TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE CASSE SHALL BE DESIG TRANSFER IT TO	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO
INSTALLED EQUI 10. DESCRIPTION O INSTALL SCRUBE INSTALL A SYST CHILLED WATER FROM THE GASSE SHALL BE DESIG	F PROPOS BING SY FEN CON VEAK A ES EMIT SNED TO D THE A	STEMS FO ISISTING ICID AND TED FROM RECIRCU ICID AREA	PROP DCTION R ALL NOI OF THREE AN OXIDIZI NINE AMMO LATE THE J FOR FURTI	ABSORPT ER AS A DNIA OI ABSORPT HER COM	TION TOU BSORPTI LIDATION TION VAT	ERS U ON ME PLAN ER/ W ION	SING DIUM T ST EAK	A RI TO F ACKS ACID	CIR IEMO SY	CULATED VE NOX STEM TO

# EXHIBIT I-M

BADGER AAP ENVIRONMENTAL ASSESSMENT

----

# FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1. COMPONENT							2.	DATE
	FY 19	MILITARY CONS	TRUCTIO	ON PRO	JECT (			
ARMY 3. INSTALLATION			<u> </u>	4. PROJEC	T TITI 1	E Mak		05 JAN 83
Badget Army Am								JE J
Visconsin				SOLVEN	T CONS			
5. PROGRAM ELEM	ENT	6. CATEGORY CODE	7. PROJE	CT NUMB	ER	8. PR	OJECT CC	DST (\$000)
•	1			· • .				
·····		226 80	TESTIMAT	ES				
							UNIT	COST
		ITEM		U/M	QUAN	TITY	COST	(\$000)
FRIMARY FACILI								
CONSTRUCTION				LS				1
SUPPORTING FAC	ILITY							
;								
•								
SUBTOTAL								
CONTINGENCY PE	RCENT	(10.00%)						
TOTAL CONTRACT								
	ISP & (	HEAD ( 5.00%)						
TOTAL REQUEST Installed Equi	DHENT.	ATUES 199909						
10. DESCRIPTION OF			<u></u>		L		<u>,</u>	
		REGENERATION FACI The activated ca				- <b>-</b> -	NORE	FFFICIENTI V
		THE ALCOHOL-ETHER						
		I THE GREEN POWDER						
		TO INSTALLATIONS O						
DUCT VORK AND								
MAXIMUM REC		RY SYSTEM TO SOLVE		EVECTE	T 1.1 - T1	18 F1		
		IT TO REDUCE ENERG				16 61	ALARUS	·
			• • • • • • • •		-			
MINIMIZE US								
		BLOVER AND VAPOR D						
		IISTING ACTIVATED	CARBON	RECOV	ERY PI	LANT	COND	ENSERS,
BLOVERS, DUCT	WORK /	ND ACCESSORIES.						
II. REQUIREMEN	T :	SF ADEQU	ATE :		SF	SU	BSTD:	ST
		· ·						
	·							
	•							

#### BADGER AAP

.

EXHIBIT I-N	ENVIRONMENTAL	ASSESSMENT
D OFFICIAL HEF ONLY JULLA DUTLING	- K'AIT'E'D E'INI	

.

	F	OR OFFICIAL US	E ONLY	(WHEN	DATA IS	ENTER	RED)			
1. COMPONENT	1						<u>-</u>		2. DA	TE
	FY 19	"MILITARY	CONST	RUCTI	ON PRO	JECT	DAT	A		
ARMY										JAN 83
3. INSTALLATION					4. PROJE	CT TITL	E Mol	bilg:	ROUP	3
Badger Army A	mmunit	ion Plant								
Visconsin 5. PROGRAM ELEN					SOLVEN					LINE (\$000)
5. PHUGHAM ELEN		6. CATEGORY CO	DE	V. PROJE	CT NUMB	ic R	0. PH	OJECI	1051	(2000)
		226 80		[		•	1			
· · · · · · · · · · · · · · · · · · ·		1 226 80	1203 8	ESTIMAT	TES					
						1		UN	17	COST
		ITEM 3			U/M	QUAN	TITY	co		(\$000)
FRIMARY FACIL	ITY									
CONSTRUCTIO					LS					
SUPPORTING FA	CILITY					1				
						ļ				
						1				
						1				
•					· ]	1				
						ł				
•						1				r
SUBTOTAL										
CONTINGENCY P	ERCENT	(10.00%)								
TOTAL CONTRAC						ļ				
SUPERVISION I		OHEAD ( 5.00	156)			ł				
TOTAL REQUEST			_							
INSTALLED EQU						L				L
IU. DESCRIPTION O	F PROPU:	SED CONSTRUCTIO								
ACTIVATED	CARBON	REGENERATION	FACII	LITIES	ENLARG	ED				
INCREASE CAPA	CITY O	F THE ACTIVAT	CED CAI	RBON RI	ECOVERY	PLAN	т то	MOR	E EF	FICIENTLY
REMOVE AND RE	COVER '	THE ALCOHOL-E	THER V	VAPORS	THAT E	VAPOR	ATE :	FROM	THE	POVDER
DURING PROCES										INCLUDE,
BUT NOT BE LI				F NEV /	BSORBE	RS, C	ONDE	NSER	5.	
BLOVERS, DUCT	WORK A	ND ACCESSORIE	S.							
WINIMISE "										
MINIMIZE U		BLOVER IND VI	ית פספ	UCT 579	STEN TO	) CONN	ECT	עווזם	TRE	SS POVDER
OPERATIONS AR									•	
HATIMUM RE	COVERY									
INSTALL HEAT							HE E	NLAR	GED	ACTIVATED
CARBON RECOVED	RY PLA	NT TO REDUCE	ENERGY	REGUI	REMENT	<b>'S</b> .				
LL BEAUTERPY			IDEOU				e 11			SF
11. REQUIREMEN		SF	YDEON1		•	SF	20	BSTD		31
										•
		•								
		•								~
				· .						
•										

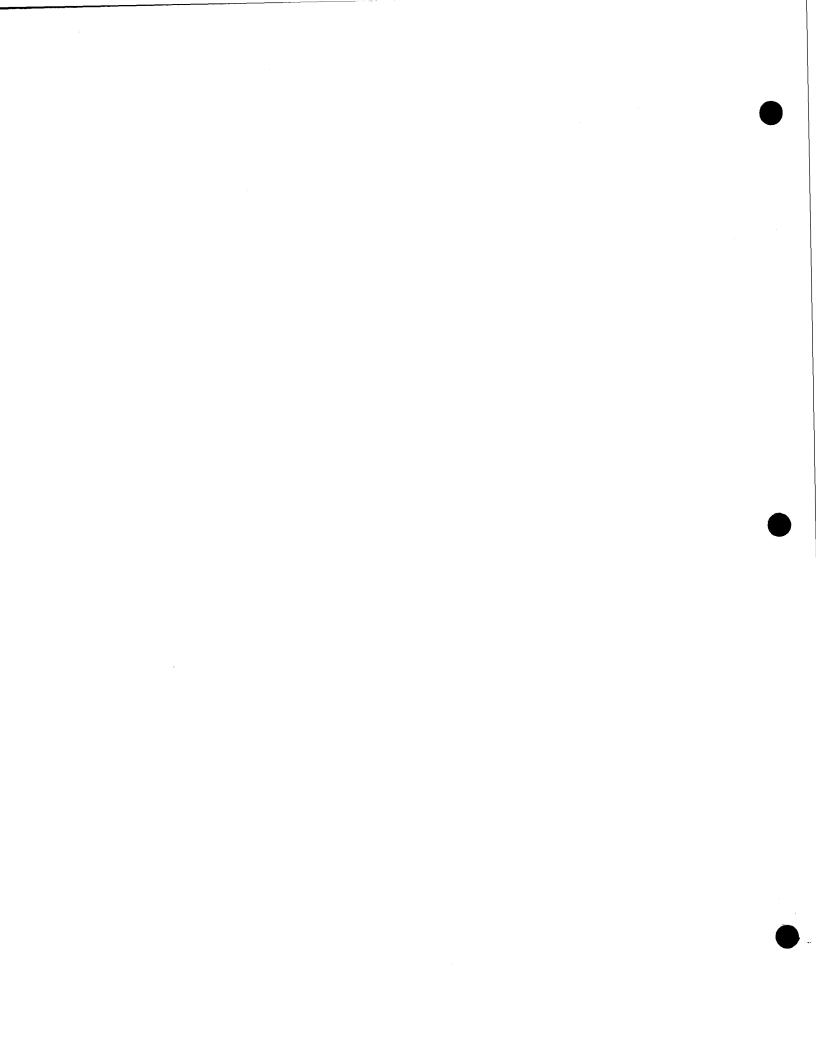


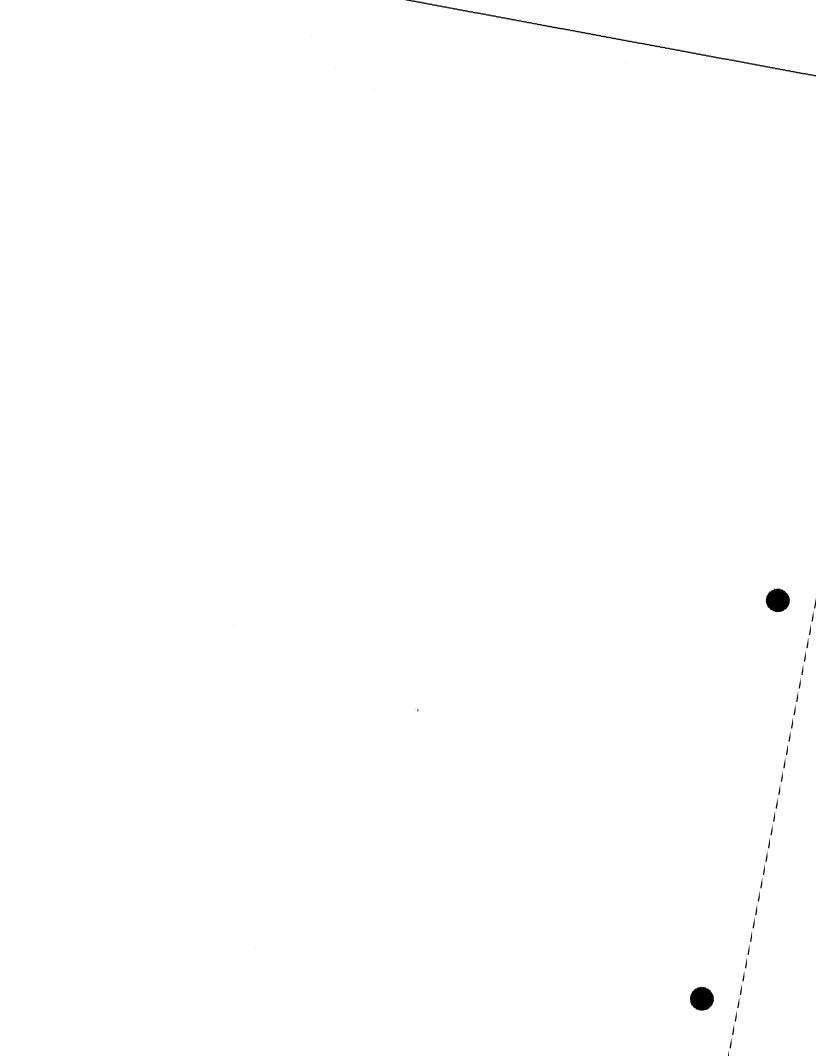
EXHIBIT I-O ENV ROFFICIAL USE ONLY (WHEN DATA IS ENTER

٠.

	F	OR OFFICIAL U	SE ONL	(WHEN	DATA		ENTER	(ED)				
1. COMPONENT	[								I	2. OA	TE	
ARMY	FY 19	12 MILITARY	CONST	RUCTI	ON PR	Ol	ECT	DATA	<b>۱</b>	45	1112 03	
3. INSTALLATION	AND LOC	ATION			4. PRO.	ECT	TITLE	Mot	i I G R		JAN 83	
Badger Army A Visconsin	mmuniti	on Plant			SOLVE							
S. PROGRAM ELEN	AENT	6. CATEGORY CO	DE	7. PROJE							(\$000)	
		226 80	0.000									<u> </u>
}		•	9. COST	ESTIMA		Т					COST	
		ITEM			U/I	M	QUAN	TITY			(\$000)	
PRIMARY FACIL	ITY					Т						
CONSTRUCTION	-				LS							
SUPPORTING FA	CILITY											
[					1							
<b>[</b> -						ł						
SUBTOTAL												
CONTINGENCY PI Total contract	- · · · ·	(10.00%)										
SUPERVISION IN		HEAD ( 5.00	(%)		ł							
TOTAL REQUEST												
INSTALLED EQU		and the second secon									L	
IV. DESCRIPTION U	F Phorus	ED CONSTRUCTIO										
ACTIVATED ( Increase capa) Remove and rec During process But not be lip Duct work and	CITY OF Cover T Sing in Hited T	THE ALCOHOL-E I The Green E To, Installat	TED CAR THER V POVDER TIONS O	LBON RE VAPORS AREA.	COVER That The M	Y 1 EV) OD)	PLANT APORA IFICA	TE E	FROM NS VO	THE VLD	POVDER Includ	Ε,
MINIHIZE US	SAGE	~										
CONSTRUCT REQU									DEHY	PRES	SS FOVDI	ER
OPERATIONS ARI	EA TO E	XISTING ACTI	VATED	CARBON	I RECO	VEI	RY PL	ANT				
11. REQUIREMEN	17:	SF	ADEQUA	TE:			SF	SUI	STD:		SF	
				•								
												•
•									•			
											<u> </u>	
DD FORM 1391		PREVIOUS ED	ITIONS M	AY BE US	SED INT	ERN	ALLY					

DD 1 DEC 76 1391

FOR OFFICIAL USE ONLY (W/// N D 17.1 /S ENTERIO)

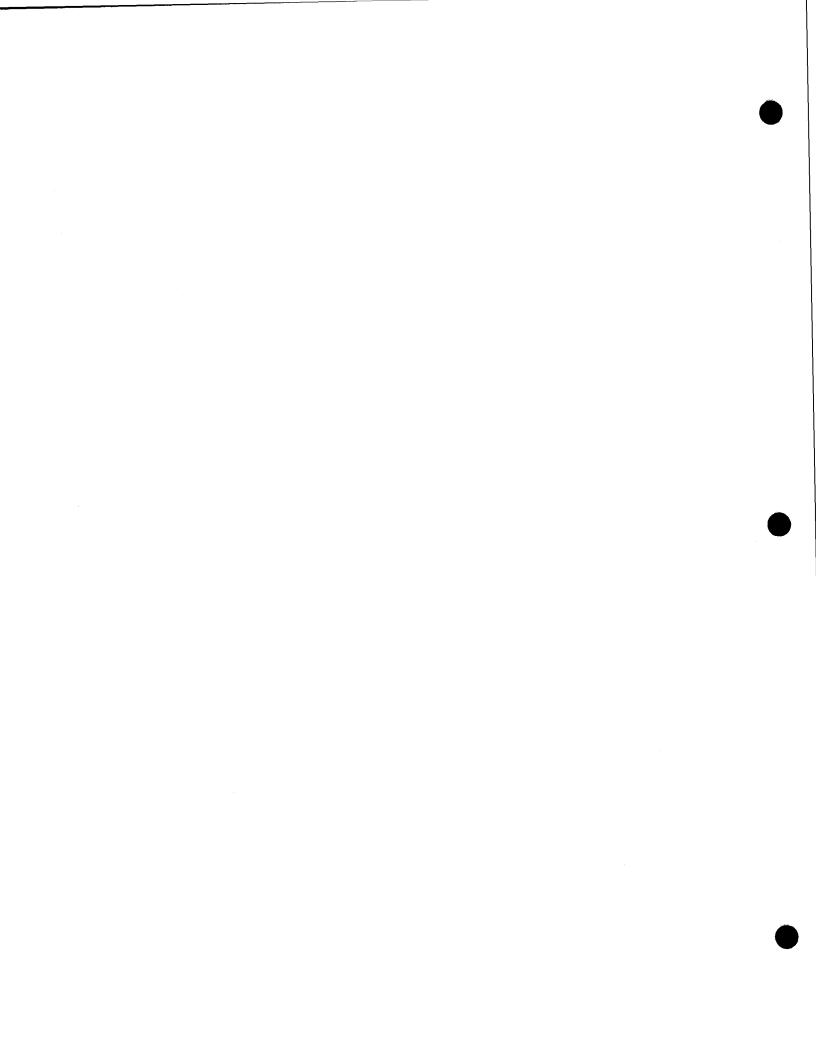


# EXHIBIT I-P

• :

	F	EXHI	BIT I-P Y(WHENI	DATA IS	BADGE ENVIR <i>ENTEREDJ</i>		ASSESSMENT
1. COMPONENT						2. D/	ATE
ARMY	FY 19	MILITARY CONS	TRUCTIC	ON PRO	JECT DATA		JAN 83
3. INSTALLATION	AND LOC	ATION		4. PROJEC	TTITLE Mol		
Badger Army A	mmunit	ion Plant					
Visconsin					T CONSERV		
5. PROGRAM ELEN	IENT	6. CATEGORY CODE	7. PROJE	CT NUMBE	K 8. PR	DJECT COST	(\$000)
		226 80	1				
			TESTIMAT	ES			
		ITEM		U/M	QUANTITY	UNIT	COST
				0/m	GUANTITY	COST	(\$000)
ERIMARY FACIL CONSTRUCTIO				LS			1
SUFFORTING FA				1.2			
							[ [
							1 I
SUBTOTAL							
CONTINGENCY P							
TOTAL CONTRAC							
TOTAL REQUEST		OHEAD ( 5.00%)					
INSTALLED EQU		-OTHER APPROP					
میں		SED CONSTRUCTION					
	RECOVE	RY SYSTEM TO SOLV NT TO REDUCE ENERG				NLARGED	ACTIVATED
	VIRED	BLOWER AND VAPOR I Existing activates					ESS POVDER
11. REQUIREMEN	NT;	SF ADEQ	UATE:		SF SU	BSTD	SF
					· .		
		· ·					
			·				

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WHEN DATA IS ENTIRED)



-----

----

	EXHIBIT	I-Q			1
OR OFFICIAL	USE ONLY /	eHEŇ	DATA	15	ENT

	г 	OR OFFICIAL U	USE ONL		DATATS	<u>r.ivjir.</u> k				
1. COMPONENT	EV 10							1	2. DA1	re .
ARMY	FT 19	<u>1</u> 9MILITAR	CONST	RUCH	ON PRO	JECI	DAT		06	JAN 83
3. INSTALLATION					4. PROJE	CT TITL	E Mo	bilGR	OVP	3
Badger Army A Wisconsin	mmunit	ion Plant			SOLVEN	T CON	SERV	ATION	ВГ	•
5. PROGRAM ELEN	ENT	6. CATEGORY C	ODE	7. PROJ	ECT NUMB		_	OJECT		
			_							
		226 8		ESTIMA	TES		L			
· · · · · · · · · · · · · · · · · · ·		ITEM			U/M	QUAN	TITY	UNI		COST
PRIMARY FACIL	174							cos	<u>-</u> +	(\$000)
CONSTRUCTIO					LS				ŀ	
SUPPORTING FA	CILITY									
										•
						{			1	
SUBTOTAL Contingency P	COCENT									
TOTAL CONTRAC								-		
SUPERVISION I	-		00%>							
TOTAL REQUEST										
INSTALLED EOU	the second s	the second s	the second s			<u>}</u>		<u> </u>		
ENERGY REC	OVERV									
INSTALL HEAT		RY SYSTEM TO	D SOLVE	NT CON	DENSERS	IN T	HE E	NLARG	ED A	CTIVATED
CARBON RECOVE										
SOLVENT RE			SCHARGE	D TO T	HE INDU	ISTRIA	L FL	OVAGE	FRO	M THE
HARDENING-SCR	EENING	OPERATION (	OF THE	BALL P	OWDER 7	REA,	INCR	EASIN	GB.	0.D. 6
C.O.D. CONTEN					ITY VOU	ILD BE	BUI	LT IN	ORI	DER TO
RECOVER AND F	URIFT	THE SOLVENT	FUX XE	U3E .						
11. REQUIREME	NT :	SF	ADEQU	ATE :		SŦ	SU	BSTD		SF
<i>,</i>										
		•			· .					
· · · ·										

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH N D TTA IS ENTERED)

#### EXHIBIT I-R ENVIRONM FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1. COMPONENT											2.04	TE	
ARMY		<u>9</u> 9MILIT	ARY	CONST	RUCT	ION P	RO.	JECT	DATA	•		JAN	83
3. INSTALLATION						4. PR	OJEC	TITL	E Mol	bilGF			
Badger Army A <u>Visconsin</u>	aavnit	ion Plan	t					10 LI.	мг с		เงก	FFFNF	35
5. PROGRAM ELEN	ENT	6. CATEGO	RY CO	DE	7. PROJ							(\$000)	
													•
			6 12	9. COST	ESTIMA	TES			L				
		ITEM				L	J/M	QUAN	TITY	UN CO		CO (\$0	ST 00)
FRIMARY FACIL													
CONSTRUCTION Supporting fr						ľ	LS						
SUBTOTAL Contingency P	FREENT		、										
TOTAL CONTRAC			,			1			j				
			5.0	0%)									
SUPERVISION I Total request	NSP 6	OHEAD (											
SUPERVISION I FOTAL REQUEST INSTALLED FOU 10. DESCRIPTION O	NSP &	OHEAD ( <u>-OTHER A</u> SED CONSTR	PPRO UCTIC	<u>2</u> )N									
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND	NSP & <u>IPMENT</u> F PROPOSI INSTAL	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST	PPRO UCTIC EEL.	P N GLASS	LINE		E S	ILO.	20'-	0 DI)	. X	40'-	-0 
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH, MOUNTED	NSP & <u>Ipment</u> Fpropos Instal On 16	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS	PPRO UCTIC EEL. OF S	P DN GLASS TEEL S	UPPORT	r svs	PEN	SION	SYST	EM, S	SILO	TO S	- 0 5 T O R I
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH, MOUNTED 9, 506 CUBIC F CONVEYER HAVI	NSP & <u>IPHENT</u> FPROPOSI INSTAL ON 16 EET OF NG 100	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F	PPRO UCTIC EEL. OF S LIME EET	P GLASS Teel S . Disc Per Ho	UPPORT Harge Ur cai	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN Capab	SYST SCR Le o	EM, S EV Fi F Coi	SILO EEDE NTRO	TO S R Llep	-0 5tor:
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH, MOUNTED 7,506 CUBIC F CONVEYER HAVI DISCHARGE INT	NSP & IPHENT FPROPOSI INSTAL ON 16 EET OF NG 100 O PRES	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO	P GLASS TEEL S . DISC PER HO N SYST	UPPORT HARGE UR CAI EM. PU	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN Capab	SYST SCR Le o	EM, S EV Fi F Coi	SILO EEDE NTRO	TO S R Llep	-0 5tor:
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH, MOUNTED 9, SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR. -
UPERVISION I TOTAL REQUEST <u>INSTALLED EQU</u> 10. DESCRIPTION O PURCHASE AND MIGH, MOUNTED 7, 506 CUBIC F CONVEYER HAVI DISCHARGE INT TEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO	P GLASS TEEL S . DISC PER HO N SYST	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN Capab	SYST SCR Le o NSTA	EM, S EV Fi F Coi	SILO EEDE NTRO 2) L	TO S R Llep	-0 5TOR -
UPERVISION I TOTAL REQUEST <u>INSTALLED EQU</u> DO. DESCRIPTION O URCHASE AND UIGH, MOUNTED SOME CUBIC F CONVEYER HAVI DISCHARGE INT EEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
UPERVISION I TOTAL REQUEST <u>INSTALLED EQU</u> 10. DESCRIPTION O PURCHASE AND MIGH, MOUNTED 7, 506 CUBIC F CONVEYER HAVI DISCHARGE INT TEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
UPERVISION I TOTAL REQUEST <u>INSTALLED EQU</u> 10. DESCRIPTION O PURCHASE AND MIGH, MOUNTED 7, 506 CUBIC F CONVEYER HAVI DISCHARGE INT TEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED V. SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED V. SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED V. SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED Y, SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED V. SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH, MOUNTED 7,506 CUBIC F CONVEYER HAVI DISCHARGE INT	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED Y, SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TWIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED Y, SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR
SUPERVISION I FOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O PURCHASE AND HIGH. MOUNTED Y, SO& CUBIC F CONVEYER HAVI DISCHARGE INT FEEDERS AND S	NSP & <u>Iphent</u> F propositing Instal ON 16 Eet of NG 106 O pres Hakers	OHEAD ( <u>-OTHER A</u> SED CONSTR L ONE ST POINTS PEBBLE CUBIC F ENT AGIT	PPRO UCTIC EEL. OF S LIME EET ATIO T NO	P GLASS TEEL S . DISC PER HO N SYST . 420-	UPPORT Harge Ur cai Em. pu 5	r sus Systi Pacit	PEN: Em, Y, I	SION TVIN CAPAB AND I	SYST SCR Le o NSTA	EN, S Ev Fi F Coi LL (S	SILO EEDE NTRO 2) L	TO S R ILLED IME	-0 5TOR

FOR OFFICIAL USE ONLY (WIFN DATA IS ENTERED)

----

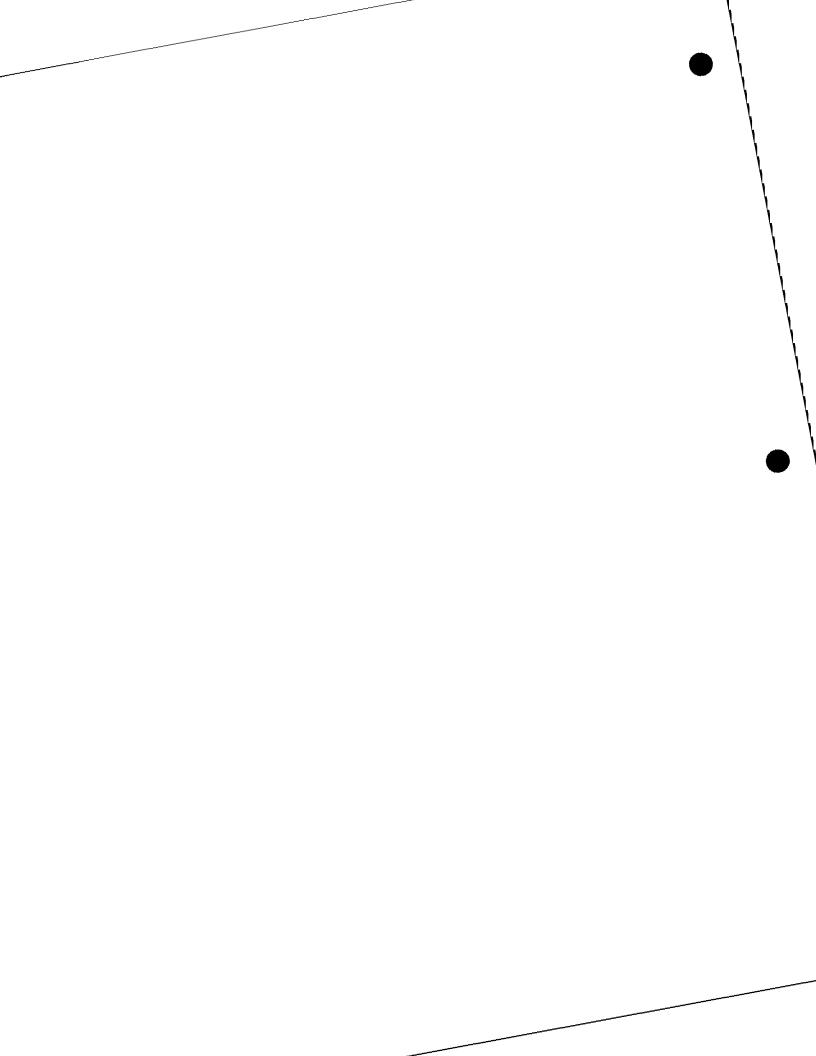
----

EXHIBIT I-S

	F	OR OFFICIAL USE ONL	Y (WHEN	DATA I	S ENTE	RED)			
1. COMPONENT	FY 19_9 MILITARY CONSTRUCTION PROJECT DATA								
ARMY	I		moon					66 J	AN 83
3. INSTALLATION	AND LOC	ATION		4. PROJE	CT TITL	E Mo	bilGR	OVP 3	
Badger Army A	mmunit	ion Plant		ļ					
Visconsin 5. program elem		C. CATCODY CODE		OLD A	CID TA			IKING	the second s
5. PROGRAM ELEN		6. CATEGORY CODE	7. PROJ	ECT NUM	DE R	0. PA		.021 (3)	0001
		226 12							
			TESTIMA	TES		L	•		
		ITEM		U/M	QUAN	TITY	UNI		COST (\$000)
PRIMARY FACIL	ITY	<b>T</b>			1			-+	
CONSTRUCTIO				LS				ł	
SUPPORTING FA	CILITY	,							
					]				
					1				
		•			1				
								1	
				-	1				
-								1	
				1	1				
SUBTOTAL									
CONTINGENCY P									
TOTAL CONTRAC					1 ·				
TOTAL REQUEST	NSPE	OHEAD ( 5.00%)							
INSTALLED EQU	IPHENT	ATHER APPROP							
		SED CONSTRUCTION			1				
		KES, MEETING FEDER	AL REG	ULATIO	4 0 C	FR 1	12-7,	PARA	GRAPH
(E) (2) (II),	AROUN	D ALL TANKS. ACCOU	JNT 708	- TAN	(S 90.	91,	722 -	TANK	80;
		2; 710 - TANKS 30,							
		723 - TANKS 50,51,							
		OLD ACID AREA. THE							
		DING TO FEDERAL RE N THE EAST SIDE TO							
		28 TO SOUTH OF UNI							
		AMPS ON THE EAST A					• -		
DOCKS ON NORT	H AND	SOUTH.							
II. REQUIREMEN	NT	SF ADEOU	ATE		SF	ទប	BSTD		SF
		•							
DO FORM ADDE		PREVIOUS EDITIONS	MAY BE U	SED INTE	RNALLY	/			
DD FORM 1391			YMAUSTE					PAG	

1 DEC 76

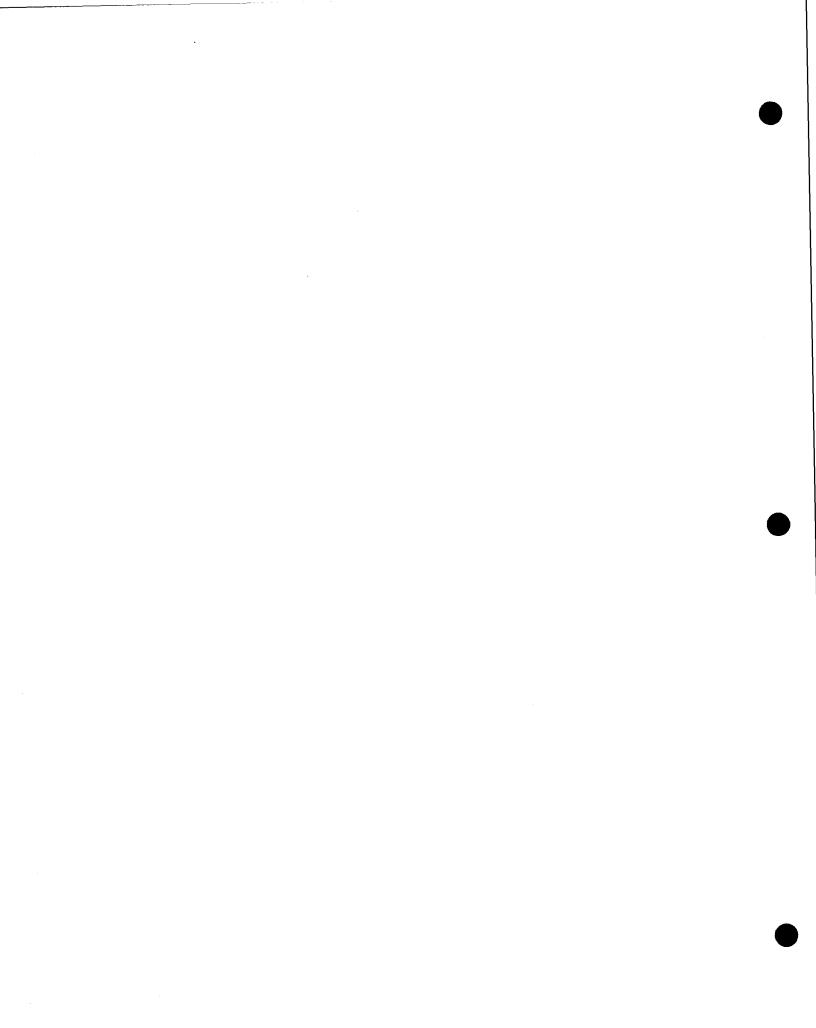
FOR OFFICIAL USE ONLY (WIFN D.17.1 IS FNTERED)



## EXHIBIT I-T ENVIRONMENTAL ASSESSMENT

BADGER AAP

FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED) 2. DATE 1. COMPONENT FY 19\_19 MILITARY CONSTRUCTION PROJECT DATA ARMY 06 JAN 83 4. PROJECT TITLE MobilGROUF 3 3. INSTALLATION AND LOCATION Badger Army Ammunition Plant TANK CAR CLEANING-OLD ACID Visconsin 5. PROGRAM ELEMENT 6. CATEGORY CODE 7. PROJECT NUMBER 8. PROJECT COST (\$000) 226 12 9. COST ESTIMATES COST UNIT ITEM U/M QUANTITY (\$0002) COST FRIMARY FACILITY CONSTRUCTION LS SUPPORTING FACILITY SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION CONSTRUCT (1) ACID TANK CAR CLEANING FACILITY (RAILROAD TYPE TANK CARS). FACILITY WILL INCLUDE & NEW BUILDING CAPABLE OF HOUSING ONE TANK CAR. SUMPS. PUMPS, CATWALKS, FUNE COLLECTION SYSTEM, NEUTRALIZING MATERIALS AND OTHER EQUIPMENT. II. REQUIREMENT: SF ADEQUATE : SF SUBSTD: SF



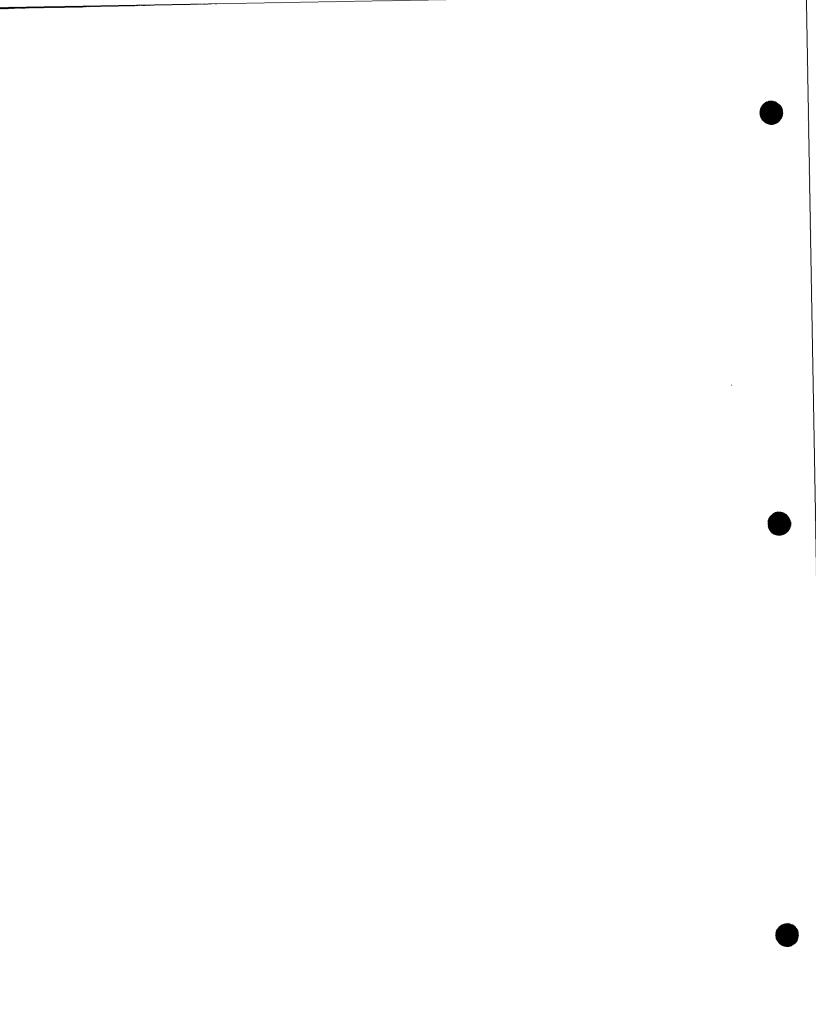
-----

EXHIBIT	I-U	

:np	06	FICIA	1 1106	ONL V	WHEN	11.17.1	10	KNTE	IJ
0.11	<b>U</b> 1	11017	- 09-	01161		1000 131			

:

1. COMPONENT	1								T	2. DAT	76
	FY 19	MILI1 و		ONST	RUCTI	ON PRO	JECT				
ARMY 3. INSTALLATION		ATION		••••••••••••••••		4. PROJEC	TTITL	E M.			JAN 63
Badger Army J			nt			Hodern			91 I G M	008	3
				MODERNIZE FOVER HOUSE NO 2							
5. PROGRAM ELEMENT 6. CATEGORY LODE 7. PROJEC						55661 1					
			21 20						·		
· <u> </u>			·	9. COST	ESTIMA	res				- 1	
		ITEM	÷.			U/M	QUAN	TITY			COST (\$000)
FRIMARY FACIL CONSTRUCTIO SUPPORTING F	N					LS					
SUBTOTAL CONTINGENCY E FOTAL CONTRAC SUPERVISION E FOTAL REQUEST INSTALLED FOLL INSTALL POLLU	T COST INSP & C IIPMENT DF PROPOS JTION A	OHEAD <u>- OTHER</u> SED CONST BATEMEN	L S. 00 APPROP RUCTION F ON F	OVR (							
CONTINGENCY E FOTAL CONTRAC SUPERVISION D FOTAL REQUEST INSTALLED FOL 10. DESCRIPTION C	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	C S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is Vi	LL INC UIPMEN	LUDE 4		BERS		FANS	
CONTINGENCY E FOTAL CONTRAC SUPERVISION D FOTAL REQUEST INSTALLED FOL INSTALL POLLU POVERHOUSE NO STACKS AND AS	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	L S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is VI Nd Eq	LL INC UIPMEN	LUDE 4	SCRUE	BERS	. 4 1	FANS	. 4 NEV
CONTINGENCY E FOTAL CONTRAC SUPERVISION E FOTAL REQUEST INSTALLED FOL INSTALL POLLU POVERHOUSE NO	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	L S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is VI Nd Eq	LL INC UIPMEN	LUDE 4	SCRUE	BERS	. 4 1	FANS	. 4 NEV
CONTINGENCY E FOTAL CONTRAC SUPERVISION E FOTAL REQUEST INSTALLED FOL INSTALL POLLU POVERHOUSE NO	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	L S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is VI Nd Eq	LL INC UIPMEN	LUDE 4	SCRUE	BERS	. 4 1	FANS	. 4 NEW
CONTINGENCY E FOTAL CONTRAC SUPERVISION E FOTAL REQUEST INSTALLED EOU INSTALL POLLU POVERHOUSE NO	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	L S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is VI Nd Eq	LL INC UIPMEN	LUDE 4	SCRUE	BERS	. 4 1	FANS	. 4 NEW
CONTINGENCY E FOTAL CONTRAC SUPERVISION E FOTAL REQUEST INSTALLED EOU INSTALL POLLU POVERHOUSE NO	T COST INSP & C <u>IIPMENT</u> DF PROPOSI JTION A D. 2, B SSOCIAT	OHEAD <u>-Other</u> Sed Const Batemen <sup>*</sup> LDG 65	L S.00 APPROP RUCTION F ON F 38. TH JORK A	OUR ( Is VI Nd Eq	LL INC UIPMEN	LUDE 4	SCRUE	BERS	. 4 1	FANS	. 4 NEW



## EXHIBIT II-A ENVIRONMENTAL PROJECTS

## Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TE-E-81-01

Title: Develop Methods for Treatment and Disposal of Pollutant Contaminated Sludge/Sediment Deposits

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During the production of single base and double base propellants, areas that received contaminated process waters now contain accumulated sediments and sludges which need to be treated and safely disposed of.

A number of the raw materials used in the manufacture of propellants at Badger AAP are listed as hazardous or toxic, and/or conventional contaminants. Continued leaching and washing action by surface waters could move any contaminants present into the groundwater system. Nitrate levels exceeding 10 ppm have been detected in one of the monitoring wells in this area.

Project is required to comply with Wisconsin Administrative orders or permit conditions.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: Select and mark all sampling sites.
  - SW-2: Determine the level of contamination by an in-depth soil sampling and analysis program.
  - SW-3: Conduct a literature search for a review on the "State of the Art" in sediment and sludge disposal technology.
  - SW-4: Select potential disposal methods for preliminary bench scale investigations.

3. Estimated schedule to perform work - tasks by months required:

Literature Search- Three monthsLaboratory Test- Three monthsDisposal Method Selection- Three monthsDisposal Method Investigation- Twelve monthsFinal Report- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 Two year project funding will be required.

## EXHIBIT II-B ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

## Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TBW-E-80-2A

Title: Divert Storm WAter at Badger AAP to Off-Plant Drainage Systems: Part I - Preliminary Concept Design

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Stormwater generated within BAAP's boundaries is collected and discharged through the General Purpose Sewer. The amount of this "clear water" entering the sewers must be minimized in order to allow proper treatment of the industrial wastewater. The General Purpose Sewer effluent must comply with provisions of the Federal Clean Water Act (PL 92-500) and with the State of Wisconsin WPDES permit.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

This project phase involves the preliminary survey and conceptual engineering design of the drainage channels within BAAP's boundaries and to develop the basis for a detailed design of diversion systems and a ROM cost estimate for the actual construction phase. This preliminary concept will be presented to the Wisconsin Department of Natural Resources for their review and/or approval and to initiate the first phase of necessary premit application.

3. Estimated schedule to perform work - tasks by months required:

Conduct on-Site Survey Develop Preliminary Project Plans Review Available Soil Borings Preliminary Design & Report

- One month
- One month
- One month
- Two and one-half months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

This project will be conducted and administered by Olin Corporation Project Engineers. The preliminary and final reports will be accepted by Olin and COR Staff personnel.

5. Estimated overall project life: (One- or two-year funding)

This project will require one year project funding.

## EXHIBIT II-C

## ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBTW-E-82-08

Title: Evaluate Treatment Technology to Remove Phthalate Esters and Amines from Wastewater Streams

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During production of Single Base and Double Base propellants, areas that received contaminated process water now contain accumulated sediments/ sludges which need to be removed for treatment and/or disposal. The sediments/sludges may contain significant levels of toxic or hazardous phthalate esters and/or amines that were present in the plant wastewater during production periods that will continue to be leached into the groundwater of the State if the contaminated soil is not removed. The removal and proper disposal of contaminated sediment/sludges would prevent continued leaching into the subsoils, and permit lining of drainage ditches and sedimentation ponds prior to plant operation if reactivation is required. Treatment of wastewaters to remove the phthalates esters and amines during future production periods is essential to prevent contamination of the waters of the State of Wisconsin. The project is required to comply with Wisconsin Administrative orders or permit conditions.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

The study would consist of:

SW-1: A literature search of disposal technology.

SW-2: Direct coordination with vendors to review installed and ongoing systems.

SW-3: Bench scale evaluation of a system adaptable to BAAP's pollutants.

SW-4: Write a final report.

## 3. Estimated schedule to perform work - tasks by months required:

Literature Search Vendor Coordination Procurement Bench Scale Equipment Lab evaluation Final Report

- Two months - Three months
- Three months - Thirteen months
- Three months

- 4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)
  - Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

5. Estimated overall project life: (One- or two-year funding) The project will require two years of funding.

## EXHIBIT II-D ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No: TBW-E-83-05

Title: Diversion of Off-Site Generated Storm Water from the Thermal Treatment (Open Burning) Sites at the Burning Grounds

## Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Storm water generated off-site flows across the Thermal Treatment sites at the Explosives and Propellant Burning Grounds dissolving soluble components from residuals remaining after treatment. The flow continues off-site and percolates into the ground and potentially may contaminate the groundwaters of the State of Wisconsin.

Both the Resource Conservation and Recovery Act (PL 95-580), and the State of Wisconsin Statutes Section 144.76(7)(c) and NR 181.44(10)(j)(k)(1) and (m) specify that "diversion structure shall be constructed such that surface water run-on...will be prevented from entering the site or facility".

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: The Subcontractor shall prepare an engineering analysis including a water balance to determine the worst condition flow situation and prepare a written report complete with topographic drawings of work to be performed in SW-2.
  - SW-2: The Subcontractor shall construct diversion ditches along the uphill slopes of the Burning Grounds to intercept storm generated surface water and drain the collected water to existing open fields below the treatment site.
  - SW-3: The Subcontractor shall uniformly smooth grade, fill, and compact all areas covered by this project and replace topsoil to a minimum depth of four inches. Before reseeding the disturbed areas, the topsoil shall be thoroughly tilled to a depth of three inches. The disturbed and reworked areas shall be reseeded with drill seeding equipment designed to fertilize and seed winter rye and grass seed on one pass. Mulching materials may be applied at the discretion of the Subcontractor to ensure seeding success and to minimize erosion.

- 2. SW-4: After completing the final grading and seeding, the Subcontractor shall remove all of his equipment and materials and restore the area to the general state of condition that existed before the start of the work. The Subcontractor shall maintain the area for a epriod of one year after seeding, during which time he shall restore crop eroded areas promptly and ressed in case of seeding failure.
  - SW-5: The Subcontractor shall prepare a Final Report complete with "As-Build" drawings of the work performed.
- 3. Estimated schedule to perform work tasks by months required:

Preliminary engineering	- One month
Prepare subcontract specifications	- One month
Request for quotations	- Two months
Evaluate quotations	- Two weeks
Award subcontract	- One month
Subcontractor mobilization	- Two weeks
Subcontractor on-site work	- Two months
Subcontractor Final Report	- Two months
BAAP review & acceptance of	
Final Report	- Two months
ELAPSED TIME	- Twelve months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and shall make necessary corrections and/or adjustments to the Subcontract as indicated by the daily inspections.

All work shall be done in a manner consistent with good workmanship and technical expertise of the Engineering and Construction profession.

5. Estimated overall project life: (One- or two-year funding)

Project work can be completed within two years of funding.

## EXHIBIT II-E ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

## Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-04

Title: Removal of Accumulated Sludge and Neutralized Acid from the Pond Near the New Acid Complex

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During the Startup and Proveout of the various acid production facilities in the New Acid Area, acidic wastes and spills were neutralized and stored in this unlined pond. The high nitrate and sulfate-laden wastes are leaching into the subsurface soil and reaching the groundwaters of the State of Wisconsin. Wisconsin Administrative Code NR 180 and 181 prohibit contamination of the groundwaters by hazardous wastes. Removal of this localized site of accumulated neutralized acids and sludges is required to prevent further contamination of the groundwaters of the state. The wastes can then be landspread in other areas of the plant where vegetation can make use of the chemicals present.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: The Subcontractor shall prepare and submit detailed before, during, and after topographic drawings of the wastewater pond and surrounding areas. Photographs (8" x 10") shall also be prepared of the subject area. These photographs shall be of such professional quality as to protray the actual restoration work that occurred.
  - SW-2: The Subcontractor shall excavate the dikes and accumulated sludge from the New Acid Complex Wastewater Pond to a depth of three (3) feet and landspread it in a designated area at a rate such that deposition of the sludge shall not exceed 150 pounds of NO3-N per acre equivalent. Actual soil equivalent shall be specified by the U.S. Army Environmental Hygiene Agency (USAEHA) and/or the Wisconsin Department of Natural Resources (WDNR).
  - SW-3: The Subcontractor shall restore the topography of the area to its original status prior to the formation of the wastewater pond and its demolition as part of this subcontract. The restoration shall include back filling the area with available clay-type subsoils, compaction of the back-filled area to 90% vector, covering the site with light (8-inches) of compacted topsoil, and finishgraded to existing topography
  - SW-4: The Subcontractor shall reseed the restored area, using grass seed mix equivalent to Wisconsin Highway Department Mix No. 3, and a cover crop of winter rye to protect the seeding effort.

3. Estimated schedule to perform work - tasks by months required:

Prepare Subcontract Specifications	- One month		
Request quotations	- One month		
Evaluate quotations	- Two weeks		
Award Subcontract	- One month		
Subcontractor mobilization	- Two weeks		
Subcontractor on-site work - demolition	- Two weeks		
Subcontractor on-site work - restoration	- Two weeks		
Subtotal - Elapsed time	- Five months		

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and make corrections and/or adjustments to the subcontract as needed as a result of field inspections and soil sampling.

The Project Engineer shall issue a Final Report covering the work done complete with before and after drawings and photographs.

5. Estimated overall project life:

Project work can be completed within one year of funding.

#### EXHIBIT II-F

#### ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

## GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TB-E-81-02

Title: BALL POWDER Wastewater Pollution Abatement Study

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Phthalate esters are listed on the Toxic Pollutant List included in PL 92-500 under Part 307. Di-n-butyl phthalate (DBP), a phthalate ester, is used in the manufacture of BALL POWDER. Diphenylamine, utilized as a stabilizer in BALL POWDER, is toxic to aquatic organisms and reacts with degradation products of nitrate ester explosives to form N-Nitrosodiphenlyamine. The U.S. Environmental Protection Agency has designated N-Nitrosodiphenylamine a priority pollutant and is setting limits on the discharge levels permitted for these pollutants in wastewater, sludge, landfill leachate, etc. The contaminated wastewater stream generated in the production of BALL POWDER would contain these pollutants plus ethyl acetate, sodium sulfate, animal protein, nitroglycerin, and possibly dinitrotoluene. The Clean Water Act requires the application of the best available, economically achievable technology (BAT), which furthers the national goal of zero discharge of pollutants.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

This project will consist of the following tasks to be completed in a two year period beginning with receipt of funding.

- a. A detailed review of related studies and surveys to characterize treatability of propellant waste streams conducted at Badger or other propellant processing plants will be completed to utilize any available data applicable to this study.
- b. Characterize the BALL POWDER processing effluent to identify and determine specific concentration of individual propellant additives.
- c. Determine effluent guidelines from current regulatory requirements.
- d. Identify candidate treatment/recovery methodologies for potential testing by review of known biotreatment and physical/chemical processes, i.e., activated sludge, sedimentation, air stripping, ultrafiltration, reverse osmosis, ion exchange, activated carbon adsorption, polymeric resin adsorption, ozone oxidation, anaerobic/aerobic rotating biological contactor, biological denitrification.

2. Continued

BADGER AAP ENVIRONMENTAL ASSESSMENT

- Select from task (d) the treatment systems for bench scale evaluations. e.
- Design, procure, install bench scale aparatus and conduct test program f. to evaluate selected technology.
- g. From results of task (f) select technologies for pilot scale evaluation.
- h. Design and construct selected pilot scale treatment facilities for evaluation of treatment/recovery methodologies and efficiencies.
- i. Conduct pilot scale testing to assess viability and optimum operating conditions for the prototype facilities.
- j. Perform economic feasibility analysis on those systems that functioned successfully.
- k. Perform a hazard analysis on systems selected in task (j).
- 3. Estimated schedule to perform work tasks by months required:
  - Characterize Effluent and Select Candidate Treatment/ a. Recovery Methodologies
    - (1) Literature Search
    - (2) Effluent Characterization
    - (3) Identify Candidate Methodologies
    - (4) Develop Bench Scale Test and Evaluation Plan
  - b. Bench Scale Evaluations of Selected Treatment/ Recovery Methodologies
    - Design, Procure and Install Bench Scale Test Apparatus
       Conduct Bench Scale Tests

    - (3) Select Technologies for Pilot Plant Scale Evaluation
    - (4) Conduct Safety Site Submission and Hazard Analysis
  - c. Pilot Scale Evaluation of Selected Treatment/Recovery Technologies

(1) Design, Procure and Install Pilot Scale Equipment

- (2) Operate Pilot Plant
- (3) Evaluate Treatment/Recovery Technologies and Economic Analysis
- (4) Final Report and Recommendations
- 4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.
- 5. Estimated overall project life: (One- or two-year funding) Project work can be completed in three years.

14 months

18 months

4 months

#### EXHIBIT II-G

#### ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBTW-E-82-07

Title: Conduct a Study for Monitoring DNT, DPA, Phthalate Esters and Nitrosoamines in Wastewater Streams

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Phthalate esters are listed on the Toxic Pollutant List included in PL 92-500 under Part 307. Di-n-butyl phthalate (DBP), a phthalate ester, is used in the manufacture of BALL POWDER. Diphenylamine, utilized as a stabilizer in BALL POWDER, is toxic to aquatic organisms and reacts with degradation products of nitrate ester explosives to form n-nitrosodiphenlyamine. The U.S. Environmental Protection Agency has designated n-nitrosodiphenylamine a priority pollutant and is setting limits on the discharge levels permitted for these pollutants in wastewater, sludge, landfill leachate, etc. The ability to quantitatively measure the level of these pollutants is required to permit the application of the most economical treatment technology while assuring compliance with applicable discharge permit limits. The discharge of propellant production wastewater may be prohibited by the State of Wisconsin unless pollutant levels can be continuously monitored.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: Conduct a survey of monitoring technologies.
  - SW-2: Select small dedicated sensors for lab evaluations.
  - SW-3: Conduct Laboratory Studies to evaluate candidate monitoring systems.
  - SW-4: Write Final Report.

#### 3. Estimated schedule to perform work - tasks by months required:

Literature search Select and procure equipment Conduct laboratory studies Write Final Report Two months
Three months
Ten-sixteen months
Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 The project will require two year funding.

## EXHIBIT II-H ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

## Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBA-E-83-03

Title: Scrubbing of Nitroglycerin Vapors

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

The Sweetie Barrel operation emits vapors that contain nitroglycerin (NG) and iso-propyl alcohol (IPA) in concentrations that are not environmentally acceptable especially in light of the more restrictive OSHA and Clean Air Act regulations. Also as far as safety is concerned, NG condenses in low spots and IPA is static sensitive, so there is a potential for explosion. Therefore, in order to reactivate this operation in compliance with all applicable regulations, a study is needed to find out the best method to control or eliminate NG and IPA vapors from the exhaust stream.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: Design and procure a bench scale scrubbing unit that will not only control/ eliminate NG and IPA vapors, but also separate these from each other.
  - SW-2: Find a scrubbing medium or media that will adsorb one or the other (i.e., either NG or IPA) but not both, and evaluate the effectiveness.
  - SW-3: Evaluate methods to dispose of the separate waste streams in an environmentally acceptable manner or possibly even to reuse/recycle the collected NG or IPA.
  - SW-4: Prepare Final Report

The effectiveness of the scrubbing operation can be judged through emission measurements or material balance equations.

3. Estimated schedule to perform work - tasks by months required:

Equipment Procurement	-	Eight	months
Laboratory Study	-	Seven	months
Final Report	-	Three	months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 This project will require two year funding.

## EXHIBIT II-I ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TBW-E-82-11

Title: Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Nitrocellulose Area

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

The nitrocellulose area now consumes 19.7 MGD when operating at full capacity. Water consumption can be reduced by 9.8 MGD by recirculating non-contact cooling water in the nitrating area; recirculating pump water in the beater, poacher and blender operation; and making process changes in the acid neutralization procedure and the boiling tub process.

The Clean Water Act requires the application of the best available, economically achievable technology (BAT) which furthers the national goal of zero discharge.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

2. St

Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

- 1. Perform a preliminary design for reuse of non-contact cooling requirements.
- 2. Prepare preliminary design of process water system to utilize cooling water.
- 3. Prepare preliminary design of acid neutralization water reuse system.
- 4. Prepare a concept design package for a water recycle/reuse system for the nitrocellulose areas.

3. Estimated schedule to perform work - tasks by months required:

Task 1 - Three months Task 2 - Three months Task 3 - Three months Task 4 - Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

## EXHIBIT II-J ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-10

Title: Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the BALL POWDER Area

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Preliminary results from the Point Source Project indicate that the amount of wastewater can be reduced from 3.72 MGD to 0.31 MGD at full capacity when new nitrocellulose is used in the feedstock. This reduction would be recirculating propellant pumping water, recirculating propellant screening spray water, and by improved propellant washing equipment.

The Clean Water Act requires the application of the best available economically achievable technology (BAT) which furthers the national goal of zero discharge of pollutants.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

Prepare a preliminary design package for reuse of non-contact cooling water requirements.

Prepare design package for water reuse throughout area.

Prepare design package for removal of organics and sulfate from effluent water and to develop reuse/recycle characteristics.

Prepare final concept design package for water reuse/recycle in the BALL POWDER Area.

3. Estimated schedule to perform work - tasks by months required:

This is a single task project requiring twelve months.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding is required.

EXHIBIT II-K

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-09

Title: Design a Water Reuse/Recycling System to Implement the Point Source Engineering Studies in the Single Base Manufacturing Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Preliminary results from the Point Source project indicate that approximately 120,000 GPD of process water can be recycled by utilizing a closed recirculation system for the required spray water and propellant flushing operations. One pass cooling water consumption could be reduced by approximately eight million GPD by installing on-site cooling tower systems. This is based on a 1.0 million pound/month Single Base production schedule. By reducing the quantity of wastewater discharged, those discharges that are required can be more effectively and economically treated.

The Clean Water Act requires the application of the best available economically achievable technology (BAT) which furthers the national goal of zero discharge of pollutants. The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - 1. Prepare preliminary design for reuse/recycle of non-contact cooling water equipment.
  - 2. Prepare preliminary design of process cooling water cooling system.
  - 3. Prepare preliminary design of system for reclaim/recycle/reuse of water-dry system water.
  - 4. Prepare concept design for implementation of water reuse/recycle system.

 Estimated schedule to perform work - tasks by months required: Engineering - Process water recycling system at six months.
 Engineering - Cooling water recycle system at six months.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

## EXHIBIT II-L ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-12

Title: Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Old Acid Complex

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Approximately 10.7 MGD of wastewater is generated in the Old Acid Area, with 10.4 MGD of this wastewater stream coming from non-contact cooling water. The cooling water can be cooled and recirculated or used as adsorption water.

The Clean Water Act requires the application of the best available, economically achievable, technology (BAT) which furthers the national goal of zero discharge of pollutants. The State of Wisconsin WPDES permit limits the level of pollutants to Primary and Secondary Drinking Water Standards.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - 1. Perform preliminary design of non-contact cooling equipment.
  - 2. Preliminary design of cooling water cooling system.
  - 3. Preliminary design of system to use cooling water as adsorption water.
  - 4. Concept design package of water recycle/reuse throughout the acid area.

3. Estimated schedule to perform work - tasks by months required:

Task 1 - Three months Task 2 - Three months Task 3 - Three months Task 4 - Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year of project funding will be required.

## EXHIBIT II-M ENVIRONMENTAL PROJECTS

Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-01

Installation of Impermeable Membrane on the Ground within the Title: Acid Storage Diked Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Acid storage tank areas in the New Acid Complex are diked to contain acid spills up to and including complete tank rupture. Dike walls are constructed mostly of concrete but some are earthen. The ground within diked areas is not impermeable and therefore will not prevent migration of hazardous acid components into the groundwater.

Acid storage tank spills have contaminated the soil in diked areas and acid migration has resulted in pollution of the groundwater such that primary and secondary drinking water standards are exceeded. The State of Wisconsin requires that proper construction of the diked areas be implemented prior to mobilization to prevent future impact and/or degradation of the groundwaters of the State.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

The existing earthen diking will be replaced with concrete and the ground within the diked areas be similarly covered. The existing drain system, consisting of individual tank drain lines leading to collection sumps located below grade, would be used to drain acid spills occurring within the diked areas. Existing catch basins located under individual tank outlets would be removed and the concrete floor sloped to these drains. The ehader drain line would be valved closed except when removing a spill or rain water. The acid or rain water drained to existing sumps would be moved with existing pumps and piping to storage/neutralization tanks or to the General Purpose Sewer in the case of rain water.

There are eight acid and one caustic soda storage diked areas which require modification. 6 . . . . . . . **.** 

Turne

ACCOUNT	<u>Type</u>
758	Spent Acid Store
759	Weak Nitric Store
760	Semi Con Mix Store
671	93% Sulfuric Store
772	Oleum Store
773	mixed Acid Store

2.

Туре

93% Sulfuric Hold Store NGMA Store Caustic Soda Store

3. Estimated schedule to perform work - tasks by months required:

All work will be subcontracted. All construction work can be completed in six months with the total project completed within one year of funding.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Subcontract work will be administered, supervised, inspected and approved by Olin facilities engineering personnel.

Estimated overall project life: (One- or two-year funding)
 One year of funding is required.

#### EXHIBIT II-N ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

## GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

## Project No.: TBW-E-83-04

Title: Upgrade Laboratory Capability for WPDES Water Monitoring Compliance

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Wastewater from the BALL POWDER, Nitrocellulose, and other production areas is discharged to the General Purpose Sewer causing high levels of BOD. BAAP's WPDES permit allows a limited amount of BOD discharge and requires its monitoring under current discharge permit conditions.

The testing for BOD is done on a weekly basis for a 24 hour composite sample. This allows six days a week of non-monitored waste discharge.

 Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

The proposed study would investigate:

- SW-1: The use of a Respirometer<sup>®</sup> which would monitor BOD levels on a continual basis.
- SW-2: Determine whether a Respirometer  $({}^{(R)}$  should be used at Point Source at the several manufacturing areas or at the general discharge area.

## 3. Estimated schedule to perform work - tasks by months required:

Procurement	- Two months
Study	- Four months
Report	- Two months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

## EXHIBIT II-0 ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

## Project:

#### Project No.: TBW-E-83-02

Title: Develop a Combined Treatment System for the Reduction of Nitrates, BOD's and COD's from the Nitrocellulose and BALL POWDER Production Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Process waste from the Nitrocellulose and BALL POWDER Manufacturing Areas are discharged in the General Purpose Sewer, increasing the BOD, COD, NO<sub>3</sub>-N, and sulfate pollutants to levels exceeding the WPDES permits. This project proposes the reduction of all four pollutants by a combined treatment system. As the carbon compounds in the BALL POWDER waste stream are consumed in support of the biological denitrification of the nitrocellulose effluent, the levels of BOD and COD would also be reduced.

- Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: Design and procure an anaerobic and aerobic bench scale digestion system.
  - SW-2: Evaluate the anaerobic treatment of high level NO<sub>2</sub> (500-1000 ppm) wastewaters.
  - SW-3: Evaluate aerobic treatment of colloid and ethyl acetate.
  - SW-4: Write Final Report.

# 3. Estimated schedule to perform work - tasks by months required:

Equipment procurement Lab evaluation Final Report

- Three months
- Twelve-eighteen months
- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 The study will require two year funding.

EXHIBIT II-P

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

# Facility:

#### GSA Inventory No.: WI-2138-20054

# Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

# Project:

#### Project No.: TBH-E-82-13

Title: Excavate and Reline Existing Nitroglycerin Pond

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

This project involves cleaning out and lining the existing Nitroglycerin (NG) Pond. The permeable sediments accumulated in the bottom of the pond are contaminated with nitrates and sulfates that were present in the wastewater effluents from the NG Manufacturing Facilities during previous production periods. These contaminants percolate into the groundwater of the State of Wisconsin such that the primary and secondary drinking water standards will be exceeded. The work is required to eliminate the percolation of contaminants into the groundwater of the State and to meet the expected requirements of the Wisconsin Pollutant Discharge Elimination System permit and the Federal Clean Water Act.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

The design and development phase of this project involves detailed drainage and subsoil engineering studies and obtaining State approval for the project.

Construction work on this project involves excavating and properly disposing of contaminated soil in the bottom of the pond and lining the pond with an acid resistant reinforced polyethylene bottom liner with a foot of sand to protect it. The work also involves reshaping the sides of the pond to control surface erosion and rebuilding the pond water elevation control structure to allow more effective operation of the wastewater treatment system.

# 3. Estimated schedule to perform work - tasks by months required:

Project Bidding Process	2	months
Development of Final Plans	4	months
Wisconsin State Approvals	6	months
Construction Bidding	2	months
Project Construction	10	months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) The project will be inspected and administrated by Olin Corporation, Project Engineers. Assistance will be required by Olin Administration and COR Government staff to support the project during public hearings and State approvals. Final project acceptance will be by Badger AAP - COR Industrial Engineer.

5. Estimated overall project life: (One- or two-year funding) This project will require two years funding to complete. EXHIBIT II-Q

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agnecy Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

# Project:

#### Project No.: TBA-E-82-06

Title: Install Stack Gas Monitoring/Analysis Equipment in Powerhouse No. 1

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Powerhouse No. 1 currently burns No. 6 Residual Fuel Oil in its oilfired boilers to provide steam for the heating of active accounts throughout Badger AAP. The Clean Air Act (PL 95-95) and Wisconsin Department of Natural Resources (WDNR) Air Pollution Control Rules (NR 154/155) require that sources of air contamination maintain emissions into the ambient air below established limitations and to prevent significant deterioration of the ambient air quality. The existing boilers are not equipped with monitoring equipment with which to monitor emissions (gas flow rate, sulfur oxides, nitrogen oxides, and carbon monoxide) from each boiler and from combined streams that are discharged into the atmosphere.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

SW-1: The Subcontractor shall engineer and design an on-site flue-gas monitoring/sampling/analytical/and microprocessing system for installation in a nine-boiler complex at Badger AAP. Such engineering and design shall be in such detail that craftsman skilled in the art will be able to read, understand, and to install such equipment and supporting hardware as will be required.

SW-2: The Subcontractor will provide an on-site monitoring/sampling/ analytical/and microprocessing equipment for nine oil-fired boilers capable of monitoring and receiving flue gas emissions that will meet and/or exceed all requirements of federal and state regulations for emission monitoring and recording of data.

SW-3: The Subcontractor shall install, commission, and calibrate all of the equipment in Powerhouse No. 1 specified in SW-2 above. He shall be totally responsible for the quality, workmanship, and operational capability of all equipment supplied and for the installation of said equipment. The Subcontractor shall provide for an approved detailed list of equipment to be used in the project within 30 days of contract award. Monitoring and analytical equipment supplied shall provide instantaneous reading accurracy of 0.5% of full-scale and have a resolution capability of 0.1% of full scale.

 SW-4: The Subcontractor shall provide a complete package of "As-Built" drawings for all elements of the project including all wiring and spool drawings as applicable.

SW-5: The Subcontractor shall provide a detailed technical report covering the engineering, procurement, construction, installation, commission, and calibration efforts of the project.

3. Estimated schedule to perform work - tasks by months required:

Preliminary engineering - Two months Prepare subcontract specifications - Two months Request for Technical Proposal - Two months Evaluation of quotation - One month Award subcontract - One month - Two months Subcontractor mobilization Subcontractor on-site work, construction - Three months Subcontractor on-site work. commissioning - One month Subcontractor on-site work, Technical Report - Two month BAAP review of Technical Report - Two months

#### ELAPSED TIME

- Eighteen months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and make corrections and/or adjustments to the subcontract as needed as a result of field inspections.

All work shall be done in a manner and expertise as specified by the applicable Wisconsin Administrative Codes and/or ASME Code Certification.

5. Estimated overall project life: (One-or two-year funding)

Project work can be completed within two years of funding.

#### EXHIBIT II-R

# BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

# Facility:

#### GSA Inventory No.: WI-2138-20054

# Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

### Project:

#### TB-E-80-8 Project No.:

Title: Conduct a Hazardous Materials and Pesticide Management/Control Study

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

AR 200-1 [10-6, subparagraph (7)(a)5] provides for special studies to be undertaken to define sources of pollution and develop remedial measures. During normal operations and agricultural leasings over the past forty-plus years, many potential toxic and/or hazardous chemicals and/or pesticides have been used within Badger AAP's boundaries. No accurate records exist as to type or quantities that may have found their way into the environment.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

A systematic soil sampling and analysis study shall be conducted for all areas at Badger AAP. This study shall review all materials that may have been used in specific areas and a coordinate grid system developed for soil sampling.

- SW-1: A computer program shall be developed to collect, analyze, store, and develop environmental management reports, permit renewals, etc., as required by various state and federal regulatory agencies and to support the soil sampling and analysis program.
- SW-2: A systematic review of land use and possible chemicals that could have been applied during the time of occupancy by the U.S. Army shall be undertaken utilizing a grid control system to identify each area.
- SW-3: Preliminary soil and monitoring well samples shall be taken from each plant area in a systematic manner so as to reflect possible patterns for further studies if potential problems are determined. Soil samples shall be taken and preserved in an approved manner so as to maintain their integrity throughout the analysis/evaluation program.

- 2. SW-4: All samples shall be analyzed for those items specified in the EPA's EP Toxicity List and for those materials suspected to be present as a result of prior plant operations. Significant results shall trigger an in-depth soil survey of the affected area to pinpoint the source of the pollution.
  - SW-5: All data generated by the soils sampling survey and laboratory analyses shall be compiled by the computer and an in-depth report issued.
- 3. Estimated schedule to perform work tasks by months required:

Computer program	- Six months
Soil sampling grid	- Three months
Soil sampling	- Eighteen months
Soils Analysis	- Eighteen months
Evaluation of data	- Three months
Final Report	- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be accomplished under the direction of Olin's assigned Project Engineer who shall evaluate progress and data developed and modify the ongoing program in accordance with the results of the study developed at that point.

5. Estimated overall project life: (One- or two-year funding)

Project work can be completed within two years of funding.

DEPARTMENT OF THE ARMY HEADQUARTERS, UNITED STATE ARMY ARMAMENT, MUNITIONS, AND CHEMICAL COMMAND SAUK CITY PUBLIC LIBRARY 515 Water Street Sauk City, WI 53583

51

# FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT FOR TOTAL PLANT OPERATIONS

BADGER ARMY AMMUNITION PLANT JULY 1983

19.7

Prepared by:

1

T-Sel Billion Con Cal

L. P. HELLEWELL Project Engineer Olin Corporation Operating Contractor

Approved by:

Inch

KENNETH R. TESCH OPSEC Review Badger AAP

Reviewed by:

and the second second

61 R. MATTEI Plant Manager

Olin Corporation Operating Contractor

Approved by:

DAVID C. FORDHAM Commander's Representative Badger AAP

Approved by:

Installation Commander Badger AAP

ENVICOTY PUBLIC LUCEUN USCONTER ST. SAMA CITT, NY 58583

. :

# BADGER AAP TOTAL PLANT OPERATIONS - EA 18

It is assumed that these new facilities will operate at mobilization at their design rates of 400 tons/day of nitric, 350 tons/day of oleum, and 500 tons/day NAC/SAC. (See Table I and III-E.)

(3) Nitrocellulose Facilities (See Table I-A)

There are no current standards for either old or new nitrocellulose facilities. The new modernized cellulose nitration facilities are designed for emissions of less than 200 ppm nitrogen oxides (as NO<sub>2</sub>) in their exhausts to the atmosphere, but the first unit is now programmed for FY 86. If mobilization occurs after that point in time, whatever pollutant emission standards existing at that time will be met.

If mobilization occurs before that point in time, the existing facilities will be used and pollutant emissions will probably exceed the current WDNR ambient air limits. Three MCA projects submitted to minimize any problems in the existing lines have been deferred to long range (See Section B.5.a, b & c).

(4) Burning Grounds

Open air burning was employed at Badger Army Ammunition Plant for disposition of explosive and propellant wastes and of explosive-contaminated wastes because it was the only known method for economical accomplishment of this operation. The burning ground area is located at sufficient distance from other plant operations and from adjacent private land so that the amount of particulate matter reaching these locations is minimal. However, since open burning is in conflict with Federal and State goals of preventing air pollution emissions, two MCA project submissions made by Badger include installation of facilities for incineration of explosive and propellant waste of explosive-contaminated waste (See Section B.5.d & e).

Open burning terminated during the spring and summer of 1978, resumed in October 1978 after a WDNR permit/license was received form the State of Wisconsin.

(5) Regulations satisfied by the monitoring program:

Under standby status, there are no emissions from inactive production facilities and maintenance activities of a magnitude for which permits/licenses are required. Under mobilization conditions, the implementation of the air monitoring sites would allow data accumulation for use in assessing the impact of the emissions from the various operations at BAAP on the ambient air, and compliance with Wisconsin Administrative Code Chapter NR 154.



\*

•

# BADGER AAP TOTAL PLANT OPERATIONS - EA 50

#### b. Incineration

Figure 3-A shows the site of the present incinerator which is in standby, inoperative, and noncomplying. The MCA project for the construction startup, proveout and operation of the Contaminated Waste processor-Small Unit is scheduled for completion during 1982. This unit will be used to dispose of combustible waste that is or may be contaminated with Propellants Explosives and/or Pyrotechnics (PEP). A MCA project submitted for the installation startup, proveout, and operation of an Explosive Waste Incinerator is in the outyear program. The use of these incinerators will reduce the amount of particulate matter and oxides of nitrogen released to the atmosphere during open burning. Amounts and types of materials to be incinerated are directly related to operational status and plant mission assignment.

#### c. Open Burning

- (1) Figure 3-A shows the current site where open burning is carried out to dispose of waste explosives and propellants and explosivecontaminated wastes because it was the only known method for safe and economical disposal of these materials. However, this method does not comply with current EPA standards. MCA projects submitted by BAAP for the installation of facilities for the incineration of explosive and propellant wastes and explosive contaminated waste are described in 4.b. above. Table I-C describes the location, contents, and status of land disposal sites at BAAP.
- (2) The Burning Grounds are operated by BAAP's Maintenance Department.
- (3) During standby operations through full mobilization, approximately 65 tons of material per year are accumulated at the Burning Grounds for disposal. These materials include waste explosives and propellant as well as roofing and structural items that are contaminated with explosives and/or propellant.
- (4) Normally, material is burned once per month depending on rate of accumulation. Ignition is accomplished with excelsior, fuel oil and a match.
- (5) Restrictions regarding operation of the Burning Grounds depend on the quantity of material to be burned, the wind factor and humidity. All operations of the Burning Grounds are covered by the Burning Grounds SOP.
- (6) No unusual burning operations are expected or anticipated to occur.
- (7) All "burns" are restricted to daylight hours.
- (8) Applicable SOP's/regulations for Burning Grounds are Standing Operating Procedure - Burning Grounds.
- (9) The MCA incinerator programs should eliminate most of the requirements for open burning and make the currently used area available for other propellant related activities.

BADGER AAP TOTAL PLANT OPERATIONS - EA 51

- (10) Authorized accounts (buildings, barricades, facilities, etc.) may be burned on-site because of a high exposure risk to personnel to propellant, explosive, and/or pyrotechnics (PEP) items present in the accounts scheduled for demolition and/or removal.
- d. Demil Operations
  - (1) Figure 3-A shows the location of propellant Demil Operations. Demil Operations at Badger AAP generally involve the salvaging of obsolete powder and/or propellants that no longer meet required ballistic characteristics. Those items that cannot be salvaged and are by-products of the salvage operation (deterrent, bags, etc.) are rendered as innocuous as possible and then burned on the burning pads.
  - (2) Types of munitions demilled:
    - (a) Obsolete small arms, rifle and cannon powders, with and without, ignitor trains.
    - (b) Rocket grain propellant.
    - (c) BALL POWDER.
    - (d) Nitrated cotton and/or woodpulps.
  - (3) No neutralization/treatment is required and/or expected all by-products are recycled in the salvage system, recovered and/ or burned as necessary at the Burning Grounds. The installation of an explosives incinerator, and an incinerator for explosive contaminated waste will eliminate the use of the open burning previously practiced on a decontaminateion pad.
  - (4) Demil Operations are carried out in the Burning Grounds under applicable SOP's. It is expected that the MCA incineration programs will replace the current procedure for demilling. operations.
- e. Recycling Operations
  - (1) Official recycling efforts scrap property sale.

Recycling of scrap and unserviceable items is accomplished at BAAP on an official continuing basis. The recycling activity is coordinated by the Olin Corporation Property Department, and all recycling events are reviewed and approved by Olin management and the Government. In most cases, the recycled materials are stored and sold from the corporation yard; however, depending upon the items being recycled, the items may be stored and sold from varying locations of the plant. The scrapped, recycled materials evolve from construction, maintenance and production activities of the plant. All vehicles are checked regularly for their compliance with existing standards.

Contractors, vendors, Corps of Engineers personnel and Corps of Engineers contractors have authorized entry on the installation on an as needed basis.

d. There is one vehicle washing station and one inactive laundry facility at BAAP. Wastewater from the laundry goes to a sump for removal of propellant contaminants before entering the general purpose (GP) sever. The wastewaters from these facilities go to the industrial waste sewer for treatment and aeration. Vehicle washing is accomplished periodically as necessary.

No records are available as to the volume or quality of the wastewater leaving these facilities.

# e. Effects of Solid Wastes

Settleable solids were removed periodically from the settling pond areas of the BAAP effluent discharge stream and placed in nearby natural land depressions on the plant site. The carriage water is allowed to evaporate, percolate into the ground, and/or return to the effluent stream. Other nonexplosive solid wastes resulting from plant operations are placed in a licensed solid waste disposal area on the plant site. Additional suitable locations for future use are available on site.

No problems have been encountered with current solid waste disposal procedures, and none are presently anticipated for the future. U.S. Army Toxic & Hazardous Materials Agency (USATHAMA) has conducted a survey of BAAP landfill operation during 1979/1980 to determine what, if any, changes are necessary for complete compliance with EPA and Wisconsin standards.

f. Effects of Hazardous and Toxic Substance

Disposal of explosive and propellant wastes and explosivecontaminated inert wastes resulting from the production and manitenance operations at this plant was by approved open burning methods. Development work is being carried out for Department of the Army on a suitable safe and pollution free method for incineration of these wastes. Table I-C describes the location, contents, and status of land disposal sites at BAAP.

MCA Projects T00400 & T00600 were submitted for the installation of an Explosive Waste Incinerator (EWI) and a Contaminated Waste Processor (CWP). The CWP has been constructed and is scheduled for proveout in October 1982. The EWI has been deferred to long-range or reactivation of BAAP.

.

•

--

EXHIBIT I-A

•

•

 $E_{\rm C}$  ,

BADGER AAP ENVIRONMENTAL ASSESSMENT

F	OR OFFICIAL USE ONLY	r i when i	DATA IS	ENTERI	ED)		
1. COMPONENT	A MILITARY CONST	RUCTIO	ON PRO.			1	DATE
ARMY						0	1 SEP 82
3. INSTALLATION AND LOG	CATION	`	4. PROJEC	T TITLE	Nob	ilGrou	p i
Badger Army Ammuni	tion Plant						
Visconsin		L				OSIVE	
5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJE	CT NUMBE	ER	8. PRO	JECT COS	T (5000)
· · · · · · · · · · · · · · · · · · ·	833 10	T ESTIMAT	<u> </u>	I			
	9.003	C C TIMAT			- T		0.007
	ITEM		U/M	QUANT	TITY	UNIT COST	COST (\$000)
PRIMARY FACILITY							
CONSTRUCT INCINE	RATOR	1	LS				
SUPPORTING FACILIT	Y						
SUPPORT FACILITI	ES		LS	]			
				i	. [		
					I		
				<b>i</b> .			
SUBTOTAL				[			
CONTINGENCY PERCEN	T (18 00%)						
TOTAL CONTRACT COS							
SUPERVISION INSP &		4		1	<b>(</b>		
TOTAL REQUEST							
INSTALLED EQUIPMEN	T-OTHER APPROP						
10. DESCRIPTION OF PROPO	SED CONSTRUCTION			· ·			· · ·
	ERATION FACILITY C						
	ASSES 1.1 AND 1.3)						
	N FURNACE USED AT						
	R LINES, ELECTRIC		• -		-		
	OR TO BE LOCATED II						
REQUIRED IN THE FU	NDS. SPACE IS AVAII	LASLE F	UK AUDI	LIUNA		-145841	UKS IF
REGUIRED IN THE EU	1016.						
II. REQUIREMENT:	TN ADEQU	JATE :		TN	SUE	STD:	TN
				••••			
PROJECT :			•				
CONSTRUCT AN INCIN	ERATION FACILITY C	APABLE	OF DEST	FROYIN	G WAS	STE PRO	PELLANT
AND EIPLOSIVES.							
							_ ·
REQUIREMENT :							
	URNING INCINERATION	N DOES	NOT MEI	ET CUR	RENT	FEDER)	AL, STATE
AND LOCAL REQUIREN	LRID,						
CURRENT SITUATION	•						
	ELLANT AND EXPLOSI	VE VAST	ES AT	-	RE DI	SPOSE	OF RY
· · · · · · · · · · · · · · · · · · ·	CONTROLLED SITUATI	-					
MEET CURRENT STAND	ARDS CONTAINED IN	40 FEDE	RAL REC	GISTER	-132	16, 23	MARCH
1975, WHICH REVOKE	D PART 76, TITLE 6	O CFR.	THE REV	OXED	REGUI	LATION	PROVIDED
DD FORM 1391	PREVIOUS EDITIONS			INALLY			
	UNTIL E OR OFFICIAL USE ONLY	XHAUSTE ( i wiien i		ENTERI		1	AGE NO.
· · ·	UN UN I IVIAL USE VILI				****		

ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construction DNSTRUCTION COMPLET	COMMAN APRIL TION:	. FORDHAM		INDEX: INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED MI	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTIMATED CC Estimated M1	DNSTRUCTION START: Idpoint of construct	DAVID ( Comman) April Tion:	I FORDHAM DER'S REPR 1988 October	ESENTATIVE 1788	INDEX: INDEX:	1748
ESTINATED CC	DNSTRUCTION START:	DAVID ( Comman) April	I. FORDHAM Der's Repr 1788	ESENTATIVE	INDEX:	
STATEMENT IS	, NUI REGUTRED.	DAVID (	. FORDHAM			
STATEMENT IS	, NUI ALGUIALD.	DAVID (	. FORDHAM			
STATEMENT IS	NOI REGUIRED.	DAVID (	. FORDHAM			
STATEMENT IS	, NOT REGULAED.					
STATEMENT IS	NOT REGULAED.	ISI DAVID	. FORDHAM			
STATEMENT IS	NOT REGULAED.	· · ·				
STATEMENT IS	AUT REGUTRED.					
	COMPLIES WITH THE IN	TENT OF PL	71-170. A	N ENVIRONM	ENTAL IM	PACT
AND EIECUTIV	E ORDER 11593. THIS	S PROJECT H	AS BEEN RE	VIEWED FOR	ENVIRON	MENTAL
	OF PRESENT ASSETS I D FOR HISTORIC IMPJ					
	RUCTURE CATEGORY :			: •		
MOBILIZATION		<b>-</b> - <b>/</b>				-
	OF THE CLEAN AIR ACT	•				T P I
	)T PROVIDED : Ject is not approve!		NOT	V COMBITIS		
			ν.			
FOR OPEN BUR	INING OF EXPLOSIVES.	•				
					· · · · · · ·	
CURRENT SITU	JATION :			(CC	NT)	
	•				*	
				•		
INCINERATOR	EIPLOSIVE WASTE				1	
4. PROJECT TIT	Embilization Group	1	• •	5.	PROJECT	NUMBER
Hidger Army Visconsin	Ammunition Plant					
	NAND LOCATION		· · · · · · · · · · · · · · · · · · ·	······································		
	FY 19_ MILITARY	CONSTRUCT	ION PROJE	CT DATA	01 5	EP 82
					2. DATE	
ARMY						SSESSIER
			- -	BADGER ENVIRO	IMENTAL A	SSESSMEN

1. COMPONENT	1						2.0/	ATE
	FY 19	<sup>10</sup> MILITARY CONS	TRUCTIO	N PRO	JECT D	ATA	21	DEC 82
ARMY 3. INSTALLATION	AND LOC	ATION		4. PROJEC	TTITLE	Hobi		
Badger Army A					ization			
Visconsin					ID LWT	-VFC		
5. PROGRAM ELEN	AENT	6. CATEGORY CODE	7. PROJEC	CT NUMB	ER   8	I. PROJ	ECT COST	(\$000)
		831 90						
			ST ESTIMAT	ES	<b>L</b> _	·····		
		ITEM		U/M	QUANT	TY	UNIT	COST
PRIMARY FACIL	1-0	· · · · · · · · · · · · · · · · · · ·					COST	(\$000)
VATER TREAT		IT		LS				ł
SUPPORTING FA								
SUPPORT FAC	ILITIES			LS	}.			{
					<b>1</b>	ļ		
				. <b>[</b>				
					[ ·			
			•					[
SUBTOTAL								
CONTINGENCY P	ERCENT	(10.00%)						
TOTAL CONTRAC				- E.	1 · · ·			
SUPERVISION I Total request		HEAD ( 5.00%)		1	1			1
					ł			1
INSTALLED EQU		OTHER APPROP						
INSTALLED EQU	I PMENT-	ED CONSTRUCTION						
INSTALLED EQU 10. DESCRIPTION C DESIGN AND IN	I PMENT- DF PROPOS STALL S	ED CONSTRUCTION						
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND	I PMENT- DF PROPOS STALL S SULFATE	ED CONSTRUCTION	WATER GI	ENERATI	ED IN T	THE T	WO ACI	
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES	IPMENT- DFPROPOS STALL S SULFATE ION SHA S TANKS	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS,	WATER GE Sary acti Utilitie	ENERATI D VASTI ES, & (	ED IN T E`WATEI DTHER N	THE T TRA IECES	WO ACI NSFER	D AREAS.
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN VITRATES AND THE INSTALLAT PIPING, PROCES	IPMENT- DFPROPOS STALL S SULFATE ION SHA S TANKS	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS	WATER GE Sary acti Utilitie	ENERATI D VASTI ES, & (	ED IN T E`WATEI DTHER N	THE T TRA IECES	WO ACI NSFER	D AREAS.
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE	ED CONSTRUCTION YSTEM IN THE ACI S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI	WATER GE Sary acti Utilitie	ENERATI D VASTI ES, & (	ED IN T E`WATEI DTHER N	THE T TRA IECES TR.	WO ACI NSFER Sary S	D AREAS.
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE	ED CONSTRUCTION YSTEM IN THE ACI S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI	WATER GE SARY ACII UTILITIE ECYCLING	ENERATI D VASTI ES, & (	ED IN T E WATER DTHER N ED WATE	THE T TRA IECES TR.	WO ACI NSFER Sary S	D AREAS. Upport
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREME PROJECT :	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT:	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEQU	WATER GE SARY ACII UTILITIE ECYCLING JATE:	ENERATI D VASTI ES, & ( Treati	ED IN T E WATER DTHER N ED WATE	THE T TRA IECES TR.	WO ACI NSFER Sary S	D AREAS. Upport
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREME PROJECT :	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT:	ED CONSTRUCTION YSTEM IN THE ACI S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI	WATER GE SARY ACII UTILITIE ECYCLING JATE:	ENERATI D VASTI ES, & ( Treati	ED IN T E WATER DTHER N ED WATE	THE T TRA IECES TR.	WO ACI NSFER Sary S	D AREAS. Upport
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREME PROJECT :	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT:	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEQU	WATER GE SARY ACII UTILITIE ECYCLING JATE:	ENERATI D VASTI ES, & ( Treati	ED IN T E WATER DTHER N ED WATE	THE T TRA IECES TR.	WO ACI NSFER Sary S	D AREAS. Upport
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMEN PROJECT : PROVIDE ACID REQUIREMENT :	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS ,PUMPS, BUILDINGS, FACILITIES FOR RI KG ADEON	WATER GE SARY ACII UTILITIE ECYCLING JATE: FACILITII	ENERATI D VASTI ES, & ( TREATI	ED IN T E WATER DTHER N ED WATE KG	THE T TRA IECES TR. SUBS	WO ACI NSFER SARY S TD:	D AREAS. Upport Xg
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEON WASTE TREATMENT I	VATER GE SARY ACII UTILITIE ECYCLING JATE: FACILITII	ENERATI D VASTI ES, & ( TREATI ES.	ED IN T E WATER DTHER N ED WATE KG EATMENT	THE T TRA IECES R. Subs	WO ACI NSFER SARY S TD: TD:	D AREAS. Upport Xg Ng Acid
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMEN PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P	I PMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS ,PUMPS, BUILDINGS, FACILITIES FOR RI KG ADEON	VATER GE SARY ACII UTILITIE ECYCLING JATE: FACILITII VASTE VAT SSURE THJ	ENERATI D VAST ES, & ( TREAT ES. FER TRI AT NITJ	ED IN T E WATE DTHER N ED WATE KG KG	THE T TRA IECES R SUBS	WO ACI NSFER SARY S TD: TD: ULFATE	D AREAS Upport KG NG Acid S Can Be
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REMOVED FROM FEDERAL & STA	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEON WASTE TREATMENT I IRED TO INSTALL V IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUI	VATER GE SARY ACTE UTILITIE CYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS.	ENERATI D VAST ES, & C TREAT ES. FER TRI AT NITI ID ARE THIS I	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R SUBS SUBS COMP S IS	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REMOVED FROM FEDERAL & STA IF THE NEW AC	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEG WASTE TREATMENT I IRED TO INSTALL V IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUI LITY MODERNIZATIO	VATER GE SARY ACTE UTILITIE CYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS.	ENERATI D VAST ES, & C TREAT ES. FER TRI AT NITI ID ARE THIS I	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R SUBS SUBS COMP S IS	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REMOVED FROM FEDERAL & STA IF THE NEW AC	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEG WASTE TREATMENT I IRED TO INSTALL V IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUI LITY MODERNIZATIO	VATER GE SARY ACTE UTILITIE CYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS.	ENERATI D VAST ES, & C TREAT ES. FER TRI AT NITI ID ARE THIS I	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R SUBS SUBS COMP S IS	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REMOVED FROM FEDERAL & STA	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEG WASTE TREATMENT I IRED TO INSTALL V IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUI LITY MODERNIZATIO	VATER GE SARY ACTE UTILITIE CYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS.	ENERATI D VAST ES, & C TREAT ES. FER TRI AT NITI ID ARE THIS I	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R SUBS SUBS COMP S IS	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT II. REQUIREMENT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REHOVED FROM FEDERAL 4 STA IF THE NEW AC COMPLETE BY MO CURRENT SITUA	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI DBILIZA	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEON WASTE TREATMENT IN IRED TO INSTALL W IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUNNIZATION TION.	WATER GE SARY ACTE UTILITIE ECYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS. DN DEFICE	ENERATI D VAST ES, & C TREAT ES. ES. TREAT ID AREA THIS I I ENCY	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R. SUBS SUBS COMP TIS COMP	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR ARE N	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY OT
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT PROJECT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REMOVED FROM FEDERAL & STAT IF THE NEW AC COMPLETE BY MO CURRENT SITUA THERE ARE NO	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI OBILIZA TION : FACILIT	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEG WASTE TREATMENT I IRED TO INSTALL V IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUI LITY MODERNIZATIO	WATER GE SARY ACTE UTILITIE ECYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS. DN DEFICE	ENERATI D VAST ES, & C TREAT ES. ES. TREAT ID AREA THIS I I ENCY	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R. SUBS SUBS COMP TIS COMP	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR ARE N	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY OT
INSTALLED EQU 10. DESCRIPTION O DESIGN AND IN NITRATES AND THE INSTALLAT PIPING, PROCES FACILITIES. P 11. REQUIREMENT II. REQUIREMENT : PROVIDE ACID REQUIREMENT : THIS PROJECT AREAS. THIS P REHOVED FROM FEDERAL 4 STA IF THE NEW AC COMPLETE BY MO CURRENT SITUA	IPMENT- DF PROPOS STALL S SULFATE ION SHA S TANKS ROVIDE NT: LIQUID IS REQU ROJECT WASTE W TE WATE ID FACI OBILIZA TION : FACILIT	ED CONSTRUCTION YSTEM IN THE ACII S FROM THE WASTE LL INCLUDE NECESS , PUMPS, BUILDINGS FACILITIES FOR RI KG ADEON WASTE TREATMENT IN IRED TO INSTALL W IS REQUIRED TO AS ATER GENERATED IN R POLLUTION REGUNNIZATION TION.	WATER GE SARY ACTE UTILITIE ECYCLING JATE: FACILITIE FACILITIE SSURE THE SSURE THE ACE ATIONS. DN DEFICE	ENERATI D VAST ES, & C TREAT ES. ES. TREAT ID AREA THIS I I ENCY	ED IN T E WATER DTHER N ED WATE KG KG KG KG KG KG KG KG KG KG KG KG KG	THE T TRA IECES R. SUBS SUBS COMP TIS COMP	WO ACI NSFER SARY S TD: TD: ULFATE LIANCE REQUIR ARE N	D AREAS UPPORT KG KG S CAN BE VITH ED ONLY OT

.

۰.

·					
1. COMPONENT					2. DATE
ARMY	FY 19 <u>10 MILITARY CO</u>	NSTRUCTI	ON PROJE	CT DATA	21 DEC 82
	NAND LOCATION				
Badger Army A Visconsin	mmunition Plant				
4. PROJECT TINL	Eilization Group 2				5. PROJECT NUMBER
Modernization OLD ACID LWT					
ULU ACIU LWI	- W[]		<u></u>	1	
					· · · · · · · · · · · · · · · · · · ·
	PROVIDED : CT IS NOT APPROVED, B TE WATER POLLUTION R				
NO DISPOSAL O BEEN REVIEWED AND EIECUTIVE Impact and co	UCTURE CATEGORY : F PRESENT ASSETS IS FOR HISTORIC IMPACT ORDER 11593 THIS P MPLIES WITH THE INTE REQUIRED. THIS IS A IS	AND COMPI Roject Ha Nt of PL	LIES WITH 5 BEEN REV 91-190. A)	THE INT VIEWED F( VIEWED F)	ENT OF PL 89-655 Or Environmental Nmental impact
	/ 5	/ DAVID C			
		GS-13	. FORDHAM		
		COMMAND	ER'S REPR	ESENTATI	VE
ESTIMATED MID	STRUCTION START: Point of constructio Struction completion		1990 OCTOBER APRIL	1990 1991	INDEX: 1867 INDEX: 1908 INDEX: 1950
	·				•
	•				•

DD FORM 1391c

PAGE NO.

1. COMPONENT					2. DA	TE
ARMY	Y 19_10MILITARY C	ONSTRUCT	ION PROJ	IECT DATA		DEC 82
3. INSTALLATION AND	LOCATION		4. PROJEC	TTITLE Hot		
Badger Army Ammu	nition Plant		1			
Visconsin				UTROCELLY	JLOSE LY	T - VFC
5. PROGRAM ELEMENT	6. CATEGORY COD	E 7.PRO	JECT NUMBE	n  o.rn	51261 6031	190001
				1 .		
	831 90	9. COST ESTIM	ATES	l		
	ITEM	**************************************	U/M	QUANTITY	UNIT	COST
·			0/M	QUANTITY	COST	(\$000)
PRIMARY FACILITY						
WATER TREATHEN			LS			1
SUPPORTING FACILI SUPPORT FACILI			LS			ļ
SULLAR INCIDI	1165	*				
		·				
				e transformer		
•.						
SUBTOTAL						
CONTINGENCY PERC						
TOTAL CONTRACT C	OST			1.1		
			•			
	& OHEAD ( 5.00)	<b>L</b> )				
TOTAL REQUEST	& OHEAD ( 5.00) ENT-OTHER APPROP	<b>L</b> )				
TOTAL REQUEST Installed Equipm						 
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PF DESIGN AND INSTA	ENT-OTHER APPROP TOPOSED CONSTRUCTION	A Emove Nitr				
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M	ENT-OTHER APPROP COPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREA	A Emove Nitr A Waste Va:	TER STREA	MS. FACI	LITY SHA	LL
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PE DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS	ENT-OTHER APPROP FOR SED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SU	4 Emove Nitr A Waste Va Spended Ma	TER STREATER FILT	MS. FACIN	LITY SHA DUIPMENT	LL ', TREATED
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PR DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ	ENT-OTHER APPROP COPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREA	4 Emove Nitr A Waste Va Spended Ma	TER STREATER FILT	MS. FACIN	LITY SHA DUIPMENT	LL ', TREATED
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT.	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING	A Enove Nitr A VASTE VA Spended MA SS, Utilit	TER STREATER FILT	AMS. FACI Fration e other nec	LITY SHA Duiphent Essary S	LL ', TREATED
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT.	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING	4 Emove Nitr A Waste Va Spended Ma	TER STREATER FILT	MS. FACIN	LITY SHA Duiphent Essary S	LL ', TREATED
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT:	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING	A Enove Nitr A VASTE VA Spended MA SS, Utilit	TER STREATER FILT	AMS. FACI Fration e other nec	LITY SHA Duiphent Essary S	LL , TREATED Upport
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT :	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING CA J	A EMOVE NITR A WASTE VA Spended Ma SS, Utilit Adequate:	FER STREA TTER FILT IES AND (	AMS. FACI TRATION E DTHER NEC GA SU	LITY SHA QUIPMENT ESSARY S BSTD:	LL , TREATED UPPORT GA
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT :	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING	A EMOVE NITR A WASTE VA Spended Ma SS, Utilit Adequate:	FER STREA TTER FILT IES AND (	AMS. FACI TRATION E DTHER NEC GA SU	LITY SHA QUIPMENT ESSARY S BSTD:	LL , TREATED UPPORT GA
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT :	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING CA J	A EMOVE NITR A WASTE VA Spended Ma SS, Utilit Adequate:	FER STREA TTER FILT IES AND (	AMS. FACI TRATION E DTHER NEC GA SU	LITY SHA QUIPMENT ESSARY S BSTD:	LL , TREATED UPPORT GA
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT :	ENT-OTHER APPROP MOPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR	A ENOVE NITR A WASTE WA Spended Ma 35, utilit Adequate: Ring Liqui	TER STREA TTER TIL IES AND ( D VASTE '	AMS. FACI TRATION E DTHER NEC GA SU TREATHENT	LITY SHA QUIPMENT ESSARY S BSTD: FACILIT	LL , TREATED UPPORT GA
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS	ENT-OTHER APPROP COPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR REQUIRED TO PROV	A EMOVE NITR A WASTE WA Spended Ma Ss. Utilit Adequate: Ring Liqui Ide Facili	TER STREA TTER TIL IES AND ( D VASTE ' TIES FOR	AMS. FACIN FRATION E DTHER NEC GA SU FREATHENT WASTE WA	LITY SHA QUIPMENT ESSARY S BSTD: Facilit Ter Trea	LL , TREATED UPPORT GA TIES. THENT
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING CA J LULOSE MANUFACTUR REQUIRED TO PROVI COMPLIANCE WITH	A EMOVE NITR A WASTE WAT SPENDED MA SS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AT	TER STREA TTER FILT IES AND ( VASTE ' TIES FOR ND STATE	AMS. FACIN FRATION E DTHER NEC GA SU IREATMENT WASTE WA REGULATIO	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN	LL , TREATED UPPORT GA IES. THENT
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C	ENT-OTHER APPROP COPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR REQUIRED TO PROV	A EMOVE NITR A WASTE WAT SPENDED MA CS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AT INES AT FU	TIES FOR ND STATE LL CAPAC	AMS. FACIN TRATION E DTHER NEC GA SU TREATMENT WASTE WA REGULATION ITY.THIS	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN PROJECT	LL , TREATED UPPORT GA IES. TMENT IS
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PR DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C REQUIRED TO ASSU	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING CA J LULOSE MANUFACTUR REQUIRED TO PROVI COMPLIANCE WITH NITROCELLULOSE L	A EMOVE NITR A WASTE WAT SPENDED MA CS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AT INES AT FU	TIES FOR ND STATE LL CAPAC	AMS. FACIN TRATION E DTHER NEC GA SU TREATMENT WASTE WA REGULATION ITY.THIS	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN PROJECT	LL , TREATED UPPORT GA IES. TMENT IS
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PR DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C REQUIRED TO ASSU	ENT-OTHER APPROP CONSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING CA J LULOSE MANUFACTUR REQUIRED TO PROVI COMPLIANCE WITH NITROCELLULOSE L	A EMOVE NITR A WASTE WAT SPENDED MA CS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AT INES AT FU	TIES FOR ND STATE LL CAPAC	AMS. FACIN TRATION E DTHER NEC GA SU TREATMENT WASTE WA REGULATION ITY.THIS	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN PROJECT	LL , TREATED UPPORT GA IES. TMENT IS
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C REQUIRED TO ASSU REACTIVATED.	ENT-OTHER APPROP MOPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR REQUIRED TO PROV COMPLIANCE WITH NITROCELLULOSE LI RE BADGER AAP WIT	A EMOVE NITR A WASTE WAT SPENDED MA CS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AT INES AT FU	TIES FOR ND STATE LL CAPAC	AMS. FACIN TRATION E DTHER NEC GA SU TREATMENT WASTE WA REGULATION ITY.THIS	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN PROJECT	LL , TREATED UPPORT GA IES. TMENT IS
TOTAL REQUEST INSTALLED EQUIPM 10. DESCRIPTION OF PF DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C REQUIRED TO ASSU REACTIVATED. CURRENT SITUATIO	ENT-OTHER APPROP COPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR REQUIRED TO PROV COMPLIANCE WITH NITROCELLULOSE LI RE BADGER AAP WIT	A EMOVE NITR A WASTE WAT SPENDED MA SS, UTILIT ADEQUATE: RING LIQUI IDE FACILIT FEDERAL AN INES AT FU LL BE IN CO	TIES FOR ND VASTE	AMS. FACI TRATION E DTHER NEC GA SU GA SU TREATMENT WASTE WA REGULATI ITY.THIS E WHEN TH	LITY SHA QUIPMENT ESSARY S BSTD: FACILIT TER TREA DNS WHEN PROJECT ESE LINE	LL , TREATED UPPORT GA TIES. TMENT IS S ARE
TOTAL REQUEST <u>INSTALLED EQUIPM</u> 10. DESCRIPTION OF PR DESIGN AND INSTA NITROCELLULOSE M INCLUDE PROCESS WATER RECYCLE EQ EQUIPMENT. 11. REQUIREMENT: PROJECT : PROJECT : PROVIDE NITROCEL REQUIREMENT : THIS PROJECT IS THAT WILL ASSURE OPERATING B & C REQUIRED TO ASSU REACTIVATED. CURRENT SITUATIO THERE ARE NO FAC	ENT-OTHER APPROP MOPOSED CONSTRUCTION LL FACILITY TO RI ANUFACTURING AREJ TANKS, PUMPS, SUS UIPMENT, BUILDING GA J LULOSE MANUFACTUR REQUIRED TO PROV COMPLIANCE WITH NITROCELLULOSE LI RE BADGER AAP WIT	A EMOVE NITR A WASTE WAT SPENDED MA SS, UTILIT ADEQUATE: RING LIQUI IDE FACILI FEDERAL AN INES AT FU LL BE IN CO	TER STREA TTER FILT IES AND ( VASTE ' ND STATE LL CAPAC DMPLIANCI	AMS. FACIN TRATION E DTHER NEC GA SU GA SU TREATMENT WASTE WA REGULATION ITY.THIS E WHEN TH VE NITRAT	LITY SHA QUIPHENT ESSARY S BSTD: FACILIT TER TREA DNS VHEN PROJECT ESE LINE ES & SUL	LL , TREATED UPPORT GA IES. THENT IS S ARE FATES

DD		FORM	1391
00	1	DEC 7	6 33

.

.

	· · ·	•					
1. COMPONENT	<b> </b>					2. DAT	Έ
ARMY	FY 19 <u>90</u> M	ILITARY CON	STRUCT	ION PROJE	CT DATA		
3. INSTALLATIO						1 12	DEC_82
Badger Army A							
Visconsin							
4. PROJECT TITLE	Bilization	Group 1		<u>, , , , , , , , , , , , , , , , , , , </u>		5. PROJECI	NUMBER
		<b>F</b> -					
B & C NITROCE	LLULOSE LW	T - VPC					
				· · · ·			
							•
							•
IMPACT IF NOT	PROVIDED	:					
IF THIS PROJE			GER AA	WILL NOT	BE IN C	OMPLIANCE	WITH
FEDERAL & STA	TE VATER P	OLLUTION REC	ULATIO	S DURING	PERIODS	OF FULL	
PRODUCTION.							
NATO INFRASTR							PCT UNC.
NO DISPOSAL O Been reviewed							
AND EXECUTIVE							
IMPACT AND CO							
STATEMENT IS							
ON & FY85 BAS							
					<b>.</b> 1	•	
				•		•	
		151		. FORDHAM			
				C. FORDHAM			
			GS-13				
				DER'S REPR	ESENTATI	VE	
ESTIMATED CON				1770		INDEX:	
ESTIMATED HID				OCTOBER	1990	INDEX:	
ESTIMATED CON	STRUCTION	COMPLETION		APRIL	1991	INDEX:	1750
		•			*		•
					•		

	F	EXHII OR OFFICIAL USE ONL	BIT I-D	TA 18	BADGE ENVIR		ASSESSME
1. COMPONENT		_10MILITARY CONS					ATE
ARMY	<u> </u>			FNU			DEC 82
3. INSTALLATION			4.1	PROJEC	TTITLE Ho	bilGroup	2
Badger Army A Visconsin	mmunit	ion Plant	D	6 E :	NITROCELL	ULOSE LV	JT -VPC
5. PROGRAM ELEN	AENT	6. CATEGORY CODE	7. PROJECT	NUMB	ER 8. PR	OJECT COS	T (\$000)
		831 90					
			T ESTIMATES		<b>_</b>	· · · · · · · · · · · · · · · · · · ·	
		ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
PRIMARY FACIL							
WATER TREAT SUPPORTING FA				LS			
SUPPORT FAC		•		LS			
		•					
		•					
•							
		· · · · ·					
SUBTOTAL							
CONTINGENCY P Total Contrac					:		
		OHEAD ( 5.00%)					
TOTAL REQUEST				- ·			
INSTALLED EQU	and the second	SED CONSTRUCTION		L	l		1
NITROCELLULOS Include proce	E MANU SS TAN	FACILITY TO REMOVE FACTURING AREA WAS KS, PUMPS, SUSPENE MENT, BUILDINGS, U	STE WATER Ded hatter	STRE. FIL	AMS, FACI Tration e	LITY SH QUIPMEN	ALL T, TREATED
11. REQUIREME	<b>Т:</b>	GA ADEQU	JATE:		GA SU	BSTD:	GA
PROJECT : Provide Nitro	CELLUL	OSE MANUFACTURING	LIQUID WA	STE	TREATMENT	FACILI	TIES.
THAT WILL ASS OPERATING D &	IS REG Ure coi e nit	UIRED TO PROVIDE I Mpliance with fede Rocellulose lines Badger <b>aap will b</b> i	AT FULL C	TATE	REGULATI ITY.THIS	ONS WHE	N IS
FROM VASTE VA	FACILI TER. P	TIES CURRENTLY EX Resent vaste vater Ent to meet the Li	R TREATHEN				
CORM		PREVIOUS EDITIONS	MAY BE LICES	1			
D FORM 1391			XHAUSTED			F	AGE NO.
	F	DR OFFICIAL USE ONLY	r (WHEN DA'	IA IS I	ENTEREDI		

.\*

:

•

÷

1. COMPONENT	2. DATE
ARMY FY 19 <u>90</u> MILITARY CONSTRUCTION PROJECT DATA	12 DEC 82
3. INSTALLATION AND LOCATION	
Badger Army Ammunition Plant Visconsin	
4. PROJECT TITLODILIZATION Group 2	5. PROJECT NUMBER
D & E NITROCELLULOSE LWT -VPC	
IMPACT (F NOT PROVIDED :	
IF THIS PROJECT IS NOT APPROVED, BADGER AAP WILL NOT BE IN C Federal & State Water Pollution Regulations during periods	
PRODUCTION.	
NATO INFRASTRUCTURE CATEGORY :	
NO DISPOSAL OF FRESENT ASSETS IS INVOLVED IN THIS PROJECT.	
BEEN REVIEWED FOR HISTORIC IMPACT AND COMPLIES WITH THE INT	
AND EXECUTIVE ORDER 11593. THIS PROJECT HAS BEEN REVIEWED I Impact and complies with the intent of PL 91-190. An enviro	
STATEMENT IS REQUIRED. THIS IS A GROUP 2 MOBILIZATION PROJE	
ON A FY85 BASIS.	
/S/ DAVID C. FORDHAM	
DAVID C. FORDHAM GS-13	
COMMANDER'S REPRESENTATI	VE
ESTIMATED CONSTRUCTION START: APRIL 1990	INDEX: 1857
ESTIMATED MIDPOINT OF CONSTRUCTION: OCTOBER 1990 ESTIMATED CONSTRUCTION COMPLETION: APRIL 1991	INDEX: 1908 INDEX: 1950
ESTIMATED CONSTRUCTION CONFLETION. AFRIL 1991	INDEX: 173V
· · ·	
	•
	and the second

DD FORM 1391c

.

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED

PAGE NO.

. •

1. COMPONENT	· · · ·	OR OFFICIAL U					2.0	ATE
	FY 19	MILITARY	CONSTRI	UCTION	PRO	JECT DA	TA	- -
ARMY 3. INSTALLATION	AND LOC	ATION		4.	PROJEC	TTITLE	lobilGroup	DEC 82
Badger Army A								•
Visconsin		· · · ·					LUT - VP	
5. PROGRAM ELEN	AENT.	6. CATEGORY C	ODE 7.	PROJECT	NUMB	ER 8.	PROJECT COST	r (2000)
		831 90	, .					
			9. COST ES	STIMATES				
۰.		ITEM			U/M	QUANTIT		COST (\$000)
PRIMARY FACIL	TTY	•						
	REATHE	INT FACILITY			LS			
		1.4 1						
		· · ·						
•								1
SUBTOTAL						[		1
CONTINGENCY P	ERCENT	(10.00%)						
TOTAL CONTRAC	T COST	•						
SUPERVISION I	NSP 4	OHEAD ( S.O	10%)					
					I			
		-OTHER APPRO						
TOTAL REQUEST INSTALLED EQU 10. DESCRIPTION O	IPHENT		DP					
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC	<u>iipment</u> F <b>PROPO</b>	SED CONSTRUCTIONS FOR TREATI	DP ON Ng Waste					•
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING	ILITIE AREA.	SED CONSTRUCTIONS S FOR TREATINE THIS INVOLV	DP ON NG WASTE Ves insta	LLATION	OF	TANKS,	PUMPS', TR	
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC., T	ILITIE AREA.	SED CONSTRUCTIONS S FOR TREATINT THIS INVOLV TIDE CONTROLL	DP ON Ng Waste Ves Insta .ed Addit	LLATION Ion of	( OF Lime	TANKS, AND SO	PUMPS', TR. DIUM SULF	
INSTALLED EOU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P	ILITIE AREA.	SED CONSTRUCTIONS S FOR TREATINT THIS INVOLV TIDE CONTROLL	DP ON Ng Waste Ves Insta .ed Addit	LLATION Ion of	( OF Lime	TANKS, AND SO	PUMPS', TR. DIUM SULF	
INSTALLED EOU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION.	ILITIE AREA. O PROV RIOR T	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN	DP ON NG WASTE Ves Insta Ed Addit (g Into T	LLATION ION OF HE PONI	( OF Lime	TANKS, AND SOI SENTLY	PUMPS, TR Dium Sulf Used for	IDE TO T
INSTALLED EOU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION.	ILITIE AREA. O PROV RIOR T	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN	DP ON Ng Waste Ves Insta .ed Addit	LLATION ION OF HE PONI	( OF Lime	TANKS, AND SOI SENTLY	PUMPS', TR. DIUM SULF	
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION.	ILITIE AREA. O PROV RIOR T	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN	DP ON NG WASTE Ves Insta Ed Addit (g Into T	LLATION ION OF HE PONI	( OF Lime	TANKS, AND SOI SENTLY	PUMPS, TR Dium Sulf Used for	IDE TO T
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREME PROJECT :	ILITIE AREA. O PROV RIOR T	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA	DP NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT	LLATION ION OF HE POND	COF LIME PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR Dium Sulfi Used for Gubstd:	IDE TO T
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREME PROJECT :	ILITIE AREA. O PROV RIOR T	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA	DP NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT	LLATION ION OF HE POND	COF LIME PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR Dium Sulfi Used for Gubstd:	IDE TO T
INSTALLED EOU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREME PROJECT : PROVIDE A NIT	TIPMENT F PROPOSI ILITIE AREA. O PROV RIOR T NT:	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA	DP NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT	LLATION ION OF HE POND	COF LIME PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR Dium Sulfi Used for Gubstd:	IDE TO T
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMEN PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT	PROVID	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA SERIN PRODUCT	DP ON NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT FION FACI	LLATION ION OF HE PONE E: LITY LI	( OF LIME ) PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR. DIUM SULFI USED FOR SUBSTD: FREATMENT	GA GA Facilit
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMEN PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT	PROVID	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA SERIN PRODUCT	DP ON NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT FION FACI	LLATION ION OF HE PONE E: LITY LI	( OF LIME ) PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR. DIUM SULFI USED FOR SUBSTD: FREATMENT	GA GA Facilit
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC MANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMEN PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT	PROVID	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA SERIN PRODUCT	DP ON NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT FION FACI	LLATION ION OF HE PONE E: LITY LI	( OF LIME ) PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR. DIUM SULFI USED FOR SUBSTD: FREATMENT	GA GA Facilit
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC MANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREME PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN	PROVID	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA CERIN PRODUCT DES MEANS OF MAY BE CONTA	DP ON NG WASTE VES INSTA ED ADDIT KG INTO T ADEQUAT FION FACI	LLATION ION OF HE PONE E: LITY LI	( OF LIME ) PRE	TANKS, AND SOI SENTLY GA S	PUMPS, TR. DIUM SULFI USED FOR SUBSTD: FREATMENT	GA GA Facilit
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC MANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMENT PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN CURRENT SITUA AT THE PRESEN	PROVID THAT	SED CONSTRUCTION S FOR TREATI THIS INVOLV VIDE CONTROLL TO DISCHARGIN GA GA CERIN PRODUCT DES MEANS OF MAY BE CONTA	DP ON NG WASTE VES INSTA ED ADDIT G INTO T ADEQUAT TION FACI NEUTRALI NEUTRALI	LLATION ION OF HE PONI E: LITY LI ZING WI IT. E NITR(	( OF LIME ) PRE (GUID ASTE	TANKS, AND SOI SENTLY GA GA VASTE VATER A ERIN MA	PUMPS, TR. DIUM SULFI USED FOR SUBSTD: TREATMENT ND DESTROY	IDE TO T GA Facilit Ying Any Ng
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC MANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMENT PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN CURRENT SITUA AT THE PRESEN OPERATION IS	PROVID THAT	SED CONSTRUCTIONS S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA CERIN PRODUCT DES MEANS OF MAY BE CONTA S VASTE VATER RGED INTO A	DP ON NG WASTE VES INSTA ED ADDIT RG INTO T ADEQUAT TION FACI NEUTRALI AINED IN R FROM TH LANDLOCK	LLATION ION OF HE PONI E: LITY LI ZING W/ IT. E NITRO ED PONI	( OF LIME ) PRE (QUID (STE ) STE	TANKS, AND SOUSENTLY GA GA WASTE WATER AN ERIN MAN HOUT TR	PUMPS, TR. DIUM SULF USED FOR SUBSTD: TREATMENT ND DESTROY	IDE TO T GA FACILIT YING ANY NG RECENT
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMENT PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN CURRENT SITUA AT THE PRESEN OPERATION IS REPORTS FROM	PROVID THAT	SED CONSTRUCTIONS SED CONSTRUCTIONS THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA CERIN PRODUCT DES MEANS OF MAY BE CONTA SANGED INTO A SINDICATE TH	DP ON NG WASTE VES INSTA ED ADDIT G INTO T ADEQUAT TION FACI NEUTRALI AINED IN & FROM TH LANDLOCK (AT THERE	LLATION ION OF HE PONI E: LITY LI ZING W/ IT. E NITR( ED PONI IS COI	( OF LIME ) PRE (QUID ASTE ) STE ) GLYC ) VIT (TAMI	TANKS, AND SOUSENTLY GA GA VASTE VATER AN ERIN MAN HOUT TR NATION	PUMPS, TR. DIUM SULF USED FOR SUBSTD: TREATMENT ND DESTROY NUFACTURIN EATMENT S OF THE GRO	IDE TO T GA FACILIT YING ANY NG RECENT DUND
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMENT PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN CURRENT SITUA AT THE PRESEN OPERATION IS REPORTS FROM RESULTING FRO	TION : TION :	SED CONSTRUCTION S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA ERIN PRODUCT DES MEANS OF MAY BE CONTA S VASTE VATER RGED INTO A INDICATE TH WATER PERCO	DP ON NG WASTE VES INSTA ED ADDIT ADEQUAT ADEQUAT TION FACI NEUTRALI AINED IN R FROM TH LANDLOCK (AT THERE DLATING I	LLATION ION OF HE PONI E: LITY LI ZING W/ IT. E NITRO ED PONI IS COI NTO THI	(OF LIME PRE (QUID ASTE OGLYC O VIT (TAMI : UND	TANKS, AND SOUSENTLY GA S VASTE VASTE VATER AN HOUT TR NATION ERLYING	PUMPS, TR DIUM SULF USED FOR SUBSTD: TREATMENT ND DESTROY NUFACTURIN EATMENT OF THE GR STRATA.	IDE TO T GA FACILIT YING ANY NG RECENT OUND HENCE, I
10. DESCRIPTION O CONSTRUCT FAC NANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION.	TION : TION :	SED CONSTRUCTION S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA ERIN PRODUCT DES MEANS OF MAY BE CONTA S VASTE VATER RGED INTO A INDICATE TH WATER PERCO	DP ON NG WASTE VES INSTA ED ADDIT ADEQUAT ADEQUAT TION FACI NEUTRALI AINED IN R FROM TH LANDLOCK (AT THERE DLATING I	LLATION ION OF HE PONI E: LITY LI ZING W/ IT. E NITRO ED PONI IS COI NTO THI	(OF LIME PRE (QUID ASTE OGLYC O VIT (TAMI : UND	TANKS, AND SOUSENTLY GA S VASTE VASTE VATER AN HOUT TR NATION ERLYING	PUMPS, TR DIUM SULF USED FOR SUBSTD: TREATMENT ND DESTROY NUFACTURIN EATMENT OF THE GR STRATA.	IDE TO T GA FACILIT YING ANY NG RECENT OUND HENCE, J
INSTALLED EQU 10. DESCRIPTION O CONSTRUCT FAC MANUFACTURING LINES; ETC.,T VASTE WATER P COLLECTION. 11. REQUIREMENT PROJECT : PROVIDE A NIT REQUIREMENT : THIS PROJECT NITROGLYCERIN CURRENT SITUA AT THE PRESEN OPERATION IS REPORTS FROM RESULTING FRO APPEARS THAT	TION : TION :	SED CONSTRUCTION S FOR TREATI THIS INVOLV TIDE CONTROLL TO DISCHARGIN GA GA ERIN PRODUCT DES MEANS OF MAY BE CONTA S VASTE VATER RGED INTO A INDICATE TH WATER PERCO	DP ON NG WASTE VES INSTA ED ADDIT ADEQUAT ADEQUAT TION FACI NEUTRALI AINED IN R FROM TH LANDLOCK (AT THERE DLATING I	LLATION ION OF HE PONI E: LITY LI ZING W/ IT. E NITRO ED PONI IS COI NTO THI	(OF LIME PRE (QUID ASTE OGLYC O VIT (TAMI : UND	TANKS, AND SOUSENTLY GA S VASTE VASTE VATER AN HOUT TR NATION ERLYING	PUMPS, TR DIUM SULF USED FOR SUBSTD: TREATMENT ND DESTROY NUFACTURIN EATMENT OF THE GR STRATA.	IDE TO T GA FACILIT YING ANY NG RECENT OUND HENCE, J

٠

1. COMPONENT ARMY 3. INSTALLATION A Badger Army Amm Visconsin				
ARMY 3. INSTALLATION A Badger Army Amm				2. DATE
Badger Army Amm	Y 1970 MILITARY COM	ISTRUCTION PROJECT	DATA	22 DEC 82
Badger Army Amm	ND LOCATION			<u> </u>
Visconsin				
	· · · · · · · · · · · · · · · · · · ·			
4. PROJECT TITLE I	lization Group 2		5.	PROJECT NUMBER
NITROCI VCERINI I				
NITROCLYCERIN L	NI - WPC			
				•
IMPACT IF NOT P	ROVIDED		•	
		HE GROUND WILL CONT	INUE TO	RE EXPOSED TO
		NITROGLYCERIN IS MAN		
н. Н				
	· · · · · · · · · · · · · · · · · · ·			
	TURE CATEGORY :			
		NVOLVED IN THIS PRO- AND COMPLIES WITH TH		
		OJECT HAS BEEN REVI		
		T OF PL 91-190. AN 1		
		ROUP 2 MOBILIZATION		
ON & FY85 BASIS	•			
	151	DAVID C. FORDHAM		
		DAVID C. FORDHAM		
		G5-13		
		COMMANDER'S REPRES	ENTATIVE	
STINATED COVET	METION START.			1NDFT - 1867
	RUCTION START: Int of construction	•	1990	INDEX: 1867 INDEX: 1908
ESTIMATED NIDPO	RUCTION START: INT OF CONSTRUCTION RUCTION COMPLETION:	: OCTOBER	1990	
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908
STIMATED NIDPO	INT OF CONSTRUCTION	: OCTOBER		INDEX: 1908

	EXHIE	BIT I-F		ENVIR	R AAP ONMENTAL	ASSESSME
	OR OFFICIAL USE ONLY	CIWIIEN D.	4 <i>F.</i> 175	ENTERED	2.07	ATE
I. COMPONENT	MILITARY CONST	FRUCTIO	N PRO	JECT DAT	A	
ARMY	TATION	14	PROJEC	TTITLE No		SEP 82
Badger Army Ammuni					-	
Visconsin 5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJEC		INT DITCHE	OJECT COST	
3. FROGRAM ELEMENT						
	831 70					
	······································	TESTIMATE	T	·	UNIT	COST
•	ITEM		U/M	QUANTITY	COST	(\$000)
EFFLUENT DITCHES	E PONDS		LS			
SUPPORTING FACILIT	r					
					ļ	1
	•					
SUBTOTAL						
CONTINGENCY PERCEN						
TOTAL CONTRACT COST Supervision insp &						an Brain
TOTAL REQUEST	UREAD ( 5.00%)					
INSTALLED EQUIPMEN	C-OTHER APPROP					
10. DESCRIPTION OF PROPO EICAVATE EXISTING I FT, LANDSPREAD THE OF IMPERMEABLE CLAN LINER MUST EITEND DITCHES AND PONDS	EFFLUENT DITCHES AN Removed sediment, Covered with 1 FT	AND LINE OF GRAN	E THE IULAR	DITCHES W PROTECTIV	ITH A J E COVER.	FT LAYER THE CLA
11. REQUIREMENG/GOT	TO 11.N LF ADEQUA	TE:		LF SUB	STD:	LF
REQUIREMENT :						
THIS FROJECT IS REC Contain high levels State of Visconsin	OF NITRATES AND S					
IMPACT IF NOT PROVI IF THIS PROJECT IS WPDES REQUIREMENTS IS INVOLVED IN THIS IMPACT AND COMPLIES	NOT APPROVED, BADG Projected for the Project. This pro	FUTURE. Ject has	NO DI Been	SPOSAL OF REVIEWED	PRESENT FOR HIS	ASSETS
						•
					•• **	
DD FORM 1391	PREVIOUS EDITIONS	MAY BE USI		RNALLY		AGE NO.

FOR OFFICIAL USE ONLY (WIIEN DATA IS ENTERED)

1. COMPONE			2. DATE
ARMY	FY 19MILITARY CONSTRUCT	ON PROJECT DATA	01 SEP 82
Badger Arm Visconsin	ION AND LOCATION Ammunition Plant		
4. PROJECT T	Applituation Group 1		5. PROJECT NUMBER
EFFLUENT D	TCHES & PONDS		· ·
	•		
HAS BEEN R 91-190 And	EVIEWED FOR ENVIRONMENTAL IMPACT Ar 200-1. This is a group I mob	AND COMPLIES WIT ILIZATION PROJECT	HTHE INTENT OF PL
		· · · · · · · · · · · · · · · · · · ·	
	/S/ DAVID C David C	. FORDHAM . Fordham	
	CONVAND	ER'S REPRESENTATI	VF
			• •
	CONSTRUCTION START: APRIL APRIL APRIL	1986 October 1986	INDEI: 1550 Indei: 1602
ESTIMATED	ONSTRUCTION COMPLETION:	APRIL 1987	INDEX: 1619
			· · · · · · · · · · · ·
	• • • • • • • • • • • • • •	•	
1			

	FOR	OFFICIAL USE ONLY	WHEN DA	TAIS	ENIERD)		A 75
1. COMPONENT	FY 1948 N	AILITARY CONSTR	UCTION	PRO	JECT DAT	A	ATE 1 SEP 82
3. INSTALLATION A	NO LOCATIO	N	4.	PROJEC	TTITLE N	obilGrou	p 1
Badger Army Am	munition	Plant					
Visconsin							R FACILI
5. PROGRAM ELEME	NT 6.C	ATEGORY CODE	PROJECT	NUMBI	ER 8. PI	ROJECT COS	T (S000)
		831 13	STIMATES				
		9. COST (	311MATES	<b>T</b>	F	1	Loost
•	11	'EM		U/M	QUANTITY	COST	COST (\$000)
PRINARY FACILI	TY		· ·		· · · · · ·		
CONSTRUCT WA		IMENT FACILI		LS			1 1
SUPPORTING FAC	ILITY						
							1
		· · ·					
		•					
				1			
SUBTOTAL							
CONTINGENCY PE	RCENT (1	0.00%)					
TOTAL CONTRACT	COST						
SUPERVISION IN	ISP & OHE	AD ( 5.00%)					
TOTAL REQUEST							
INSTALLED EQUI	PMENT-OT	HER APPROP					
10. DESCRIPTION OF							
		O REMOVE AND CON Sulfate for reu					
		B.O.D. & C.O.D.	36 ARU	910-0	LIUNIIUN	INDAIND	RI IU
IREAL WADLE WA	IER FUR	B.O.D. & G.O.D.					
11. REQUIREMEN	T:	ADEQUA	TE:		S	UBSTD:	
FROJECT :							
CONSTRUCT BALL	POWDER	VASTE VATER TREA	THENT F	ACILI	TY.		
REQUIREMENT :				· · · ·			
		D TO REMOVE AND					
		SODIUM SULFATE Or B.O.D. & C.O.					
IU IREAI VASIE LINITS.	WAILK P	UK B.U.D. 4 C.U.	D. 30 B	AUGER	NVL AIP	L RUI LA	CLED WPD
witti 10,							
CURRENT SITUAT	TION :						
		R IS PARTIALLY T	REATED	IN EI	LISTING W	ASTE TRE	ATHENT
		NOT ADEQUATE TO					
		·					
· · · ·		•					
•		•			•		
•		•	•		-		
		•	•				

BADGER AAP

DD FORM 1391

.

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

.

۰.

	والمستجرب والمستجرب والمستحد والمستجر والمستحد والمستحد المتعاد المتعادي والمستحد والم				فيعدد المراجع والفركمانية المراجع
1. COMPONENT	FY 19 ISMILITARY CONST	RUCTION PROJE		2. DAT	E
ARMY				01 5	5EP 82
	Amo LOCATION Innunition Plant				
Visconsin		·····			
4. PROJECT TIT	Abilization Group 1			5. PROJECT	NUMBER
BALL POWDER S	ASTE WATER FACILITY				
•	•				
IMPACT IF NOT THE CONSTRUCT	F PROVIDED : FION OF A MULTI FACETED V	INIT TO TREAT T	HE DIFFER	ENT POLL	TANTS
IN THE BALL	POWDER MANUFACTURING AREA	IS NECESSARY	BECAUSE VI	ITHOUT IT	
WILL EXCEED	VPDES LIMITS. THIS IS A (	GROUP I MOBILIZ	ATION PRO	JECT.	
			•		
	RUCTURE CATEGORY : Has been reviewed and 11	r wig brew nete	RHINED TH	AT AN EN	VIRON
	T STATEMENT PURSUANT TO P				
		AVID C. FORDHAM AVID C. FORDHAM			
	c	DMMANDER'S REPR	ESENTATIV	E	
ESTINATED CO	NSTRUCTION START:	APRIL 1988		INDEX:	1710
	DPOINT OF CONSTRUCTION:	OCTOBER	1788	INDEX:	
ESTIMATED CO					-
	NSTRUCTION COMPLETION:	APRIL	1989	INDEX:	-
	NSINUCIION COMPLETION.	APRIL	1989		-
			1989		-
		APRIL	1789		-
			1789		-
					-
					-
					-
					-
					-
					-
•					-
					-

.

J

,

EXHIBIT I-H

	F	OR OFFICIAL USE ONL	Y (WHEN	DATA 15	ENTER	(FD)		
1. COMPONENT								DATE
A 0.41Y	FY 19	A MILITARY CONS	TRUCTI	ON PRO	JECT	DAT		7 JAN 83
ARMY 3. INSTALLATION	AND LOC	ATION		4. PROJE	CT TITL	Exe	<u>i Z</u>	4 JAN F3
BADGER ARMY AN	HUNITI	ION PLANT	·			- 110		<b>J</b>
VISCONSIN				CLOST	EXIST			ANDETLL-SV
5. PROGRAM ELEM	AENT	6. CATEGORY CODE	7. PROJ	ECT NUMB	ER	8. PR	OJECT COS	ST (\$000)
						1		
		<u>871 90</u>	TESTIMA	TOZEC				
		· · · · · · · · · · · · · · · · · · ·	T Carlona		1		UNIT	COST
		ITEM	-	U/M	QUAN	ITITY	COST	(\$000)
PRIMARY FACIL	ITY	· · · · · · · · · · · · · · · · · · ·			Ι			
Close Exist		i11		LS				
Open New La				LS				
SUPPORTING FA	CILITY							
						•		
							1	
		•						
								1
•		•	· .		1			
							1	
SUBTOTAL								
CONTINGENCY PI	ERCENT	(10.00%)						
TOTAL CONTRAC	T COST							
SUPERVISION IN	SF & C	DHEAD ( 5.00%)					ł	a an
TOTAL REQUEST Installed Equ		ATUES INCOM						
		SED CONSTRUCTION		L	<u> </u>		L	<u> </u>
		5 20 ACRE LANDFILL						
		GRANULAR SOIL. 24	INCHES	OF COM	PACTE	D CL.	AY AND	6 INCHES
OF TOP SOIL AN	NU SEEI	۶.						
B. CONSTRU	CT NEW	SANITARY LANDFILL	VITH /	S 500	т сон	PACT	ED CLAY	LINER. 1
FOOT OF GRANUI	LAR PRO	TECTIVE COVER OVE	R LINES	A. LEAC	нате 🗄	COLL	ECTION S	
GAS COLLECTION	N SYSTI	EM. THE NEW LANDFI	LL WIL	L COVER	12 A	CRES	•	
		WILL MEET THE REG						
		NRIGO SOLID WASTE			TUP A	1300	N IN	
			, invitado					
D. ACCESSA	BILITY	FOR THE HANDICAPP	ED IS ?	OT REG	UIRED	FOR	FUNCTI	DNAL
REASONS.								
LI BRAULARWE			100					
11. REQUIREMEN	41:	12 as ADEQU	ATE:		0. ac	50)	BSTD:	20 ac
PROJECT :								
		ROVIDE & WISCONSIN					RESOUR	CES
APPROVED LANDI	FILL AN	ID CLOSE EXISTING	SUBSTAN	NDARD L	ANDFI	LL.		
							алан (т. 1997) 1997 - Алан (т. 1997) 1997 - Алан (т. 1997)	
		•	•					•
			•			•		
		. ·						

DD FORM 1391

.

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WIIEN DATA IS ENTERED)

PAGE NO.

1. COMPONENT		
	FY 1916 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 26 JAN 83
ARMY		24 JAN 83
3. INSTALLATIO	N AND LOCATION	
BADGER ARMY A	MMUNITION PLANT	
VISCONSIN		
4. PROJECT TITL	Bilization Group 1	5. PROJECT NUMBER
CLOSC PYTETIO	PEN NEW LANDFILL-SW	CT02/00
CLUSE EXISTIC	FER REW LANDFIEL-SW	CT02600
REQUIREMENT	·	
	LANDFILL IS SUBSTANDARD. THIS PROJECT IS REQUI	
	PACT OF THE LEACHATE BEING DEVELOPED BY THE EX	
	CONDUCTANCE AND DISSOLVED IRON VALUES IN THE FROM MONITORING WELLS DOWNGRADIENT OF THE LAN	
	HATE IS ENTERING THE AQUIFER. CONTINUED USE OF	
and the second	IS LOCATED OVER A VERY POROUS SUBSOIL COULD R.	·
	TAMINATION OF THE GROUNDWATER. BADGER AAP HAS	
	78-1194 REQUIRING THAT THE EXISTING LANDFILL B.	
ACCEPTABLE PL	AN FOR CONTINUED OPERATION BE PROVIDED.	
CURRENT SITUA		
	TE DISPOSAL SITE CONTINUES TO BE USED UNDER A	
	ARTMENT OF NATURAL RESOURCES (VDNR) LICENSE NO 8 pending a final review of a feasibility repo	
	PECIAL ORDER NO. 2A-78-1194 WAS ISSUED BY THE	
	8, REQUIRING THE PREPARATION OF THE FEASIBILIT	
	HER AN ACCEPTABLE ABANDONMENT PLAN OR CONTINUE	
BY 1 FEBRUARY	1980 WITH ACTUAL ABANDONMENT OR BRINGING THE	SITE INTO
	1 DECEMBER 1980. ALTHOUGH THERE HAS BEEN & SL	
	PLIANCE DATES, THE WONR ORDER TO BAAP STILL ST	
	D UNTIL 1986, IT IS PLANNED TO CONTINUE OPERAT	
	FILL IN A MANNER SO AS TO MINIMIZE CONTAMINATI	UN IN
COORDINATION	AITU ANUU'	
•	· · · · · · · · · · · · · · · · · · ·	
IMPACT IF NOT	PROVIDED :	
IF THIS PROJE	CT IS NOT FUNDED AND CONSTRUCTION WORK COMPLET	ED WITH AN
	PROGRESS IN THE INTERIM, BAAP COULD BE FORCED	
	ORDER 2A-78-1194 TO CLOSE THE FACILITY. CLOSUR	
	L SITE WOULD CAUSE THE CESSATION OF BARRICADE	ł
	OJECT WORK SINCE ALL OF THE DEMOLITION DEBRIS	
	D OF IN THE EXISTING LANDFILL. SAUK COUNTY'S S	
	TE, LOCATED APPROXIMATELY 18 MILES FROM BAAP, Municipal-type garbage and industrial firms ar	
	FIND OTHER MEANS OF DISPOSAL.	

1					•			2. DA	TE
ARMY	FY 19	1 MILITARY	CONST	RUCTI	ON PRO	JECT D	ATA		SEP 82
3. INSTALLATION A	ND LOCA	TION			4. PROJE	CTTITLE	•••••		361 00
Badger Army Am					Conver				
Visconsin		•••••••••	•				RHOU	ISE NO 1	TO CON
S. PROGRAM ELEME	ENT	S. CATEGORY CO	DOE	7. PROJ	ECT NUMB	ER	B. PRO	JECT COST	(\$090)
	L	821 20		<u> </u>		<u> </u>			· . ·
			9. COS1	T ESTIMA		1			
		ITEM			0/м	QUANT	ידו	UNIT COST	COST (\$000)
PRIMARY FACILI	ITY						+		
CONVERT POVE	RHOUSE				LS				
SUPPORTING FAC	TILITY		· ·						
SITE PREPARA	KOITI				LS				
						ł.			
					ł				
					1				
					1	1			
						1			
:									
SUBTOTAL									
CONTINGENCY PE		(10.00%)							
TOTAL CONTRACT Supervision in		WEND ( 5 0	041				. [		
TOTAL REQUEST									
INSTALLED EQUI		OTHER APPRO	P						
10. DESCRIPTION OF	PROPOSE	D CONSTRUCTIO	DN .						
INSTALL COAL P		•			·				
EXISTING OIL E									
INCLUDE, BUT N									
CALL TULUING S						-			
COAL THAVING J Platforms, coj	AL AND	UIL BUAREAS							
PLATFORMS, CO			BOILER	FEED					
	HEAT	EXCHANGER,			PUMPS,	POLLUT	ION	ABATEME	T
PLATFORMS, CON Valve blowdown	Y HEAT Acks, I	EICHANGER, D Fans, Ash	I HANDE	ING SY	PUMPS, STEM, (	POLLUT	10N 5 61	ABATEMEI INSTRUME	T
FLATFORMS, COJ Valve blovdova Equipment, Stj Building modii Transformer Vj	HEAT Acks, I Ficatio Ard And	EICHANGER, D Fans, Ash N Vill be N	I HANDE Iecessa	ING SY RY, TH	PUMPS, Stem, ( e elect	POLLUT Controi Tric SV	ION 5 EI /ITCH	ABATEMEI Instrumei I gear,	NT NTATION
FLATFORMS, CO) Valve blowdow Equipment, St) Building modii	HEAT Acks, I Ficatio Ard And	EICHANGER, D Fans, Ash N Vill be N	I HANDE Iecessa	ING SY RY, TH	PUMPS, Stem, ( e elect	POLLUT Controi Tric SV	ION 5 EI /ITCH	ABATEMEI Instrumei I gear,	NT NTATION
FLATFORMS, COJ Valve blovdova Equipment, Stj Building modii Transformer Vj	Y HEAT ACKS, I Ficatio Ard And Tem.	EICHANGER, D FANS, ASH N WILL BE N D ELECTRIC I	I HANDE Iecessa	ING SY RY, TH (UST BE	PUMPS, Stem, ( e elect	POLLUT Controi Fric SV Ated Fo	ION 5 E1 VITCH DR TH	ABATEMEI Instrumei I gear,	NT NTATION
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMEN	Y HEAT ACKS, I Ficatio Ard And Tem.	EICHANGER, D FANS, ASH N WILL BE N D ELECTRIC I	I HANDE Iecessa .Ines M	ING SY RY, TH (UST BE	PUMPS, Stem, ( e elect	POLLUT Controi Fric SV Ated Fo	ION 5 E1 VITCH DR TH	ABATEMEI Instrumei I gear, Ie pollu	NT NTATION TION
FLATFORMS, COJ VALVE BLOWDOWN EQUIPMENT, STJ BUILDING MODIE TRANSFORMER YJ ABATEMENT SYST 11. REQUIREMEN PROJECT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT:	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB	I HANDE IECESSA .INES F Adequ	ING SY RY, TH (UST BE JATE:	PUMPS, STEM, ( E Elect Reloca	POLLUT CONTROI TRIC SV Ated F( MB	ION 5 61 VITCH DR TH SUE	ABATEMEI Instrumei I gear, I gear, I gear, Isto:	NT NTATION TION NB
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER VI ABATEMENT SYST 11. REQUIREMEN PROJECT : PROJECT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB	I HANDE IECESSA .INES F Adequ	ING SY RY, TH (UST BE JATE:	PUMPS, STEM, ( E Elect Reloca	POLLUT CONTROI TRIC SV Ated F( MB	ION 5 61 VITCH DR TH SUE	ABATEMEI Instrumei I gear, I gear, I gear, Isto:	NT NTATION TION NB
FLATFORMS, COJ VALVE BLOWDOWN EQUIPMENT, STJ BUILDING MODIE TRANSFORMER YJ ABATEMENT SYST 11. REQUIREMEN PROJECT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB	I HANDE IECESSA .INES F Adequ	ING SY RY, TH (UST BE JATE:	PUMPS, STEM, ( E Elect Reloca	POLLUT CONTROI TRIC SV Ated F( MB	ION 5 61 VITCH DR TH SUE	ABATEMEI Instrumei I gear, I gear, I gear, Isto:	NT NTATION TION NB
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER VI ABATEMENT SYST 11. REQUIREMEN PROJECT : PROJECT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB	I HANDE IECESSA .INES F Adequ	ING SY RY, TH (UST BE JATE:	PUMPS, STEM, ( E Elect Reloca	POLLUT CONTROI TRIC SV Ated F( MB	ION 5 61 VITCH DR TH SUE	ABATEMEI Instrumei I gear, I gear, I gear, Isto:	NT NTATION TION NB
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMEN PROJECT : PROVIDE COAL E EXISTING OIL E REQUIREMENT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN FIRED B	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB (G, COAL FIE OILERS.	I HANDE IECESSA INES M Adequ	ING SY RY. TH (UST BE NATE: (D POLL	PUMPS, STEM, ( E ELECT Reloca	POLLUT CONTROI TRIC SV Ated F( MB	ION S EI VITCH DR TH SUE	ABATEMEI Instrume: I gear, Ie pollu Isto: Equipmen	NT NTATION TION NB T ON S
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMENT PROJECT : PROVIDE COAL N EXISTING OIL N REQUIREMENT : THIS PROJECT	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN FIRED B	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB (G, COAL FIE OILERS.	I HANDE IECESSA INES M Adequ NING AM	ARY, TH (UST BE NATE: (D POLL	PUMPS, STEM, ( E ELECT RELOCA	POLLUT CONTROI TRIC SV ATED FO MB ABATENI	SOUI	ABATEMEI INSTRUMEI I GEAR, IE POLLU ISTO: IQUIPMEN RCE DURI	NT NTATION TION NB T ON S NG THE
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMEN PROJECT : PROVIDE COAL E EXISTING OIL E REQUIREMENT :	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN FIRED B	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB (G, COAL FIE OILERS.	I HANDE IECESSA INES M Adequ NING AM	ARY, TH (UST BE NATE: (D POLL	PUMPS, STEM, ( E ELECT RELOCA	POLLUT CONTROI TRIC SV ATED FO MB ABATENI	SOUI	ABATEMEI INSTRUMEI I GEAR, IE POLLU ISTO: IQUIPMEN RCE DURI	NT NTATION TION NB T ON S NG THE
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMENT PROJECT : PROVIDE COAL N EXISTING OIL N REQUIREMENT : THIS PROJECT	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN FIRED B	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB (G, COAL FIE OILERS.	I HANDE IECESSA INES M Adequ NING AM	ARY, TH (UST BE NATE: (D POLL	PUMPS, STEM, ( E ELECT RELOCA	POLLUT CONTROI TRIC SV ATED FO MB ABATENI	SOUI	ABATEMEI INSTRUMEI I GEAR, IE POLLU ISTO: IQUIPMEN RCE DURI	NT NTATION TION NB T ON S NG THE
FLATFORMS, CON VALVE BLOWDOWN EQUIPMENT, ST BUILDING MODIE TRANSFORMER YN ABATEMENT SYST 11. REQUIREMENT PROJECT : PROVIDE COAL N EXISTING OIL N REQUIREMENT : THIS PROJECT	Y HEAT ACKS, I FICATIO ARD AND TEM. NT: HANDLIN FIRED B	EICHANGER, D FANS, ASH N VILL BE N D ELECTRIC I MB (G, COAL FIE OILERS.	I HANDE IECESSA INES M Adequ NING AM	ARY, TH (UST BE NATE: (D POLL	PUMPS, STEM, ( E ELECT RELOCA	POLLUT CONTROI TRIC SV ATED FO MB ABATENI	SOUI	ABATEMEI INSTRUMEI I GEAR, IE POLLU ISTO: IQUIPMEN RCE DURI	NT NTATION TION NB T ON S NG THE

BADGER AAP

DD FORM 1391

•

•

1. COMPONEN	IT ]	•				DNMENTAL	
ARMY		MILITARY CONS	STRUCT	ION PROJE	CT DATA		SEP 82
	TION AND LOO						
Badger Army Visconsin	y Ammunitia	on Plant					
4. PROJECT T						5. PROJEC	
Conversion							
CONVERT PO	VERHOUSE NO	1 TO COAL					
				×			
CURRENT SI	TUATION :						
		5 ARE OIL FIRED	. IF NO	T APPROVE	D, PRODU	CTION HAS	Y CEASE
BECAUSE OF	LACK OF FU	JEL.					
INPLCT IF	NOT PROVID	ED •					
IF NOT APP	ROVED. PROI	DUCTION MAY CEA	SE BECA	USE OF LA	CK OF FU	EL. NO D	ISPOSAL
OF PRESENT	ASSETS IS	INVOLVED IN TH	IS PROJ	ECT. THIS	PROJECT	HAS BEE!	<b>4</b>
		C IMPACT AND CO					
EXECUTIVE	ORDER 1159:	3. THIS PROJECT	HAS BE	EN REVIEW	ED FOR E	NVIRONMEN	TAL
		VITH THE INTENT					
				/ . = . /			
STATEMENT	IS REQUIRE			· · · · · · · ·			
STATEMENT							
STATEMENT		D.		. FORDHAM			
STATEMENT		D. /S/	DAVID C		ĩ		
STATEMENT		D. /5/	DYAID C	. FORDHAM . Fordham	I I		
STATEMENT		D. /5/	DYAID C	. FORDHAM	I I		
STATEMENT		D. /5/	DYAID C	. FORDHAM . Fordham	I I		
STATEMENT		D. /5/	DYAID C	. FORDHAM . Fordham	I I		
ESTIMATED	IS REQUIRED	D. /S/ On start:	DAVID C DAVID C Commany April	: FORDHAM : FORDHAM Der's Repr 1947	ESENTAT I	VE Index	: 1619
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /S/ On Start:	DAVID C DAVID C Commany April	: FORDHAM : FORDHAM Der's Repr 1947	ESENTATI 1987	VE INDEX INDEX	: 1619
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673
ESTIMATED ESTIMATED	IS REQUIRES Constructio Midpoint 0	D. /5/ on start: F construction:	DAVID C DAVID C Commany April	E FORDHAM Fordham Der's Repr 1967 October	ESENTATI 1987	VE INDEX INDEX	: 1619 : 1673

:

		EXHIBIT I-J	ENVI
OR	OFFICIAL	USE ONLY (WHEN DAT.	A IS ENTERED)

1. COMPONENT							A IS	-				
1. COMPONENT	EV 10	<u>*</u> 9MIL	ITARY	CONIST	BUCT						DATE	
ARMY	' ' ' '	WITC		CUNSI	nuch						85 J)	N 83
3. INSTALLATION	N AND LOC	ATION			······	4. P	ROJEC	TTITLE	Hob	IGRO	UP 3	
Badger Army	Ammunit	ion Pl	ant			Cor	.vers	ion				
Visconsin								ID MIS				·····
5. PROGRAM ELE	MENT	6. CATE	GORY CO	DE	7. PROJ	ECT	NUMBE	R	8. PR(	D T D JECT C	DST (SO	00)
	. •		226 12	·								
<u> </u>		J		9. COS	ESTIMA	TES						
		ITEM					<b>U/M</b>	QUAN	TITY	UNIT		COST (\$000)
PRIMARY FACI	LITY											
PURCHASE A	ND INST	ALL					LS					
SUPPORTING F	ACILITY											
						е — н. 1						
						. 1						
	•											
UBTOTAL												
ONTINGENCY	PERCENT	(10.0	0%)									
TOTAL CONTRA									I			
SUPERVISION			( 5.0	)%)					1			
TOTAL REQUES												
INSTALLED EQ	UIPHENT	-OTHER	APPRO	P								
10. DESCRIPTION	OF PROPO	SED CON	STRUCTIC	DN								<u> </u>
REMOVE EXIST	ING DEN	ISTER A	AT OLE	IM PLA	NT AND	REF	LACE	WITH	моя	E EFF	ICIEI	1T
UNIT.		<u>.                                    </u>				-				· · · ·		
IJ. REQUIREM	ENT :		SF	ADEQU.	NTE:			SF	SVE	STD:		58
										•		
										•		
										•		
										•		
										•		
										•		
										•		
						-						
						-						
						-						
						-						
					•	-						
			•									
			••		•							

•

:

PAGE NO.

	EXHI FOR OFFICIAL USE ONL	BIT I-K		ENVIRU	INMENTAL	- AJJEJJNEN
1. COMPONENT		Y /W/IEN	DATA IS	ENTERED)	2. 0/	ويست المحادث بالمتحدث المتكاف المحاد
FY 1	9_19MILITARY CONS	TRUCTI	ON PRO	JECT DATA		
ARMY 3. INSTALLATION AND LO	CATION			TTITLE Mob	1 85	JAN 63
Badger Army Ammunil				Mob	11GROUP	j
Visconsin			OLD OL	EUM LVT		
5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJ	ECT NUMB	ER 8. PRC	DJECT COST	(\$000)
	831 90	T ESTIMA	760	I		
	ITEM 4	I ESTIMA	U/M	QUANTITY	UNIT	COST
			0/m	QUANTITY	COST	(\$000)
PRIMARY FACILITY						
CONSTRUCTION			LS			
SUPPORTING FACILITY						
<b>}</b>						
			(			
			1			
SUBTOTAL						
	C (10.00%)					
SUBTOTAL Contingency percent Total contract cost	7					
CONTINGENCY PERCENT Total contract cost Supervision insp 6	7					
CONTINGENCY PERCENT TOTAL CONTRACT COST Supervision insp & Total request	OHEAD ( 5.00%)					
CONTINGENCY PERCENT	OHEAD ( 5.00%) C-OTHER APPROP					
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST <u>INSTALLED EQUIPMENT</u> 10. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU	OHEAD ( 5.00%) C-OTHER APPROP DSED CONSTRUCTION ISTMENT BASIN TO TH	REAT VAT	TER FOR	PH CONTRO	DL BEFOR	Έ
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST <u>INSTALLED EQUIPMENT</u> 10. DESCRIPTION OF PROPO CONSTRUCT A PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISCEIVING POND.		TER FOR			E
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT 10. DESCRIPTION OF PROPO CONSTRUCT A PH ADJU	OHEAD ( 5.00%) C-OTHER APPROP DSED CONSTRUCTION ISTMENT BASIN TO TH		TER FOR		DL BEFOR	E XC
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST <u>INSTALLED EQUIPMENT</u> 10. DESCRIPTION OF PROPO CONSTRUCT & PH & DJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISCEIVING POND.		TER FOR			E XC
CONTINGENCY PERCENT FOTAL CONTRACT COST SUPERVISION INSP & FOTAL REQUEST INSTALLED EQUIPMENT 10. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISCEIVING POND.		TER FOR			E XC
CONTINGENCY PERCENT FOTAL CONTRACT COST SUPERVISION INSP & FOTAL REQUEST INSTALLED EQUIPMENT 10. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISCEIVING POND.		TER FOR			E XG
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISCEIVING POND.		TER FOR			E XG
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XC
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XG
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XC
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XC
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XG
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XG
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			E XC
CONTINGENCY PERCENT TOTAL CONTRACT COST SUPERVISION INSP & TOTAL REQUEST INSTALLED EQUIPMENT TO. DESCRIPTION OF PROPO CONSTRUCT & PH ADJU DISCHARGING INTO RE	OHEAD ( 5.00%) <u>C-OTHER APPROP</u> DSED CONSTRUCTION ISTMENT BASIN TO THE ISTMENT BASIN TO THE ISTMENT POND.		TER FOR			xc

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH DATA IS ENTERED)

PAGE NO.

		•			BADGER		
	FOR OFF	EXHIB	IT I-L ( <i>WHEN DA</i>			ONMENTAL	ASSESSM
1. COMPONENT	T					2. D	ATE
	FY 19 19 MIL	ITARY CONSTRUCTION PROJECT DA					
ARMY 3. INSTALLATION	AND LOCATION	· · · · · · · · · · · · · · · · · · ·	4. P	ROJEC	TTITLE Mo		JAN 83
	mmunition Pla	nt			10		•
Visconsin					ABATEME	NT OLD A	<u>CID</u>
5. PROGRAM ELE	MENT 6. CATE	GORY CODE	7. PROJECT	NUMB	:R   8. Ph		(2000)
		26 12					
			ESTIMATES			·····	
•	ITEM			0/м	QUANTITY	UNIT	COST (\$000)
PRIMARY FACIL	177						
CONSTRUCTIO				LS			ł
SUPPORTING FA	CILITY						
							1
					· ·		
						1	
•							
SUBTOTAL							
CONTINGENCY F	PERCENT (10.00	)%) <sup>2</sup>					
TOTAL CONTRAC				1			
	NSP & OHEAD	( 5.00%)					
TOTAL REQUEST	IPMENT-OTHER	199009					
	OF PROPOSED CONS	and the second		ليستعج	L	<u>.</u>	
INSTALL SCRUB	BING SYSTEMS	FOR ALL NOT	STACKS AT		ACID PL.	ANT DES	ICN AND
INSTALL A SYS	TEN CONSISTIN	IG OF THREE	BSORPTIO	N TOU	ERS USIN	G A RECI	RCULATER
CHILLED WATER	IVEXK ACID AN	ID AN OXIDIZI	ER AS ABS	JRPTI	ON MEDIU	H TO REN	OVE NOI
	ES EMITTED FR						
	GNED TO RECIR					YCID YN	DTO
TRANSFER IT T	O THE ACID AR	LEA FOR FURTE	IER CONCE	TRAT	TION.		
II. REQUIREME	:NT :	SE ADEQUA	NTE:		SF SU	BSTD:	SF
						•	
						•	
		,					
		· · · · ·					
<b>,</b>						•	
	a second	•					•
	· .	· · · · · ·			·		•
DD FORM 1391	PRE	VIOUS EDITIONS A UNTIL E	AAY BE USED XHAUSTED	INTER	NALLY	 	AGE NO.

1 DEC 76 1391

٠, :

> UNTIL EXHAUSTED FOR OFFICIAL USE ONLY /WITEN DATA IS ENTEREDI

# . . EXHIBIT I-M

BADGER AAP

ENVIRONMENTAL ASSESSMENT

.

FOR	OFFICIAL	USE ONLY	IWHEN DATA	IS ENTERED)
			1	

	F	OR OFFICIAL USE	ONLY (W)	IEN DA	TA IS	ENTER	(ED)			
1. COMPONENT	EV 10	MILITARY CO	NICTON	CTION	000	IECTI			2. DA	TE
ARMY	• • • • •	<u> </u>			FRU			`	95	JAN 83
3. INSTALLATION	_			4. P	ROJE	T TITL	E Mob	i I C R	OUP	3
Badget Army Ar	munit	ion Plant							·	
Visconsin 5. program Elem	ENT	6. CATEGORY CODE	17.0	SO I SO I		CONS		DJECT		
J. Phoone Cecil		S. CATEGORT CODE	/.r	NUICUII	<b>U</b> MBI		0.111			190401
		226 80								а.
			. COST EST	IMATES			L			
		ITEM			U/M	QUAN	τιτγ			COST (\$000)
FRIMARY FACIL	ITY	·								
CONSTRUCTION	ł				LS					
SUPPORTING FA	CILITY									
					1		[		1	
					1	2	1			
							[			
					1		- I			
SUBTOTAL Contingency Pi	RCENT	(10 00%)								
TOTAL CONTRACT		(10.002)								
		OHEAD ( 5.00%)	)							
TOTAL REQUEST										
INSTALLED EQU					L				]	! 
10. DESCRIPTION O	F PROPO	SED CONSTRUCTION								
INCREASE CAPA REMOVE AND RED DURING PROCESS BUT NOT BE LIN DUCT VORK AND	CITY O COVER SING I AITED ACCES		D CARBON IER VAPO VDER ARI	ч RECO Drs Th ea. Th	VERY AT E' E Mo	PLAN Vapor Dific	ATE E Ation	FROM	THE DULD	POVDER Include,
HAXIMUM RE										
		RY SYSTEM TO SO NT TO REDUCE ED					HE EI	NLAKU	,	ACIIVAILU
OPERATIONS AR	UIRED El to	BLOVER AND VAP Existing Activ And Accessorie	ATED CAN							
II. REQUIREMEN	NT:	SF A	DEQUATE	:		SF	SVI	BSTD:		SF
	•									
		•						•		
•										
· .										
			•							

EXHIBIT I-N ENVIRONMENTAL ASSESSME FOR OFFICIAL USE ONLY AVUEL DATA IS ENVIRONMENTAL ASSESSME I.COMPONENT FY 19_17MILITARY CONSTRUCTION PROJECT DATA 25 DATE 35 PROJECT TITLE HOB ILCROUP 3 Badget Array Amsunition Plant 300/ENT CONSERVATION C LINE 3.PROJECT CONSERVATION 3.PROJECT CONST 3.PROJECT CONST 3.PROJECT CONSERVATION C CONST 3.PROJECT C				.*				ADGER		
1.COMPONENT       FY 19_17MILITARY CONSTRUCTION PROJECT DATA       2.DATE         3.INSTALLATION AND LOCATION       4.PROJECT TOTLE MobilGROUP 3         Bidger Army Ambunition Plant       SOLVENT CONSERVATION CLINE         9.GOGRAM ELEMENT       6.CATEGORY CODE       7.PROJECT NUMBER         9.COGST ESTIMATES       9.COST ESTIMATES         9.COST ESTIMATES       9.COST ESTIMATES      <		<b>F</b> .		XHIBI	T I-N	17.1 15	ENTER	VVIRO	NMENTAL	_ ASSESSMEN
AMMY       FY 19_17MILITARY CONSTRUCTION PROJECT DATA       05 JAN 63         ARMY       05 JAN 63       05 JAN 63         3.INSTALLATION AND LOCATION       4.PROJECT TITLE HobIICROUP 3         Bidger Army Ambunition Plant       5.CATEGORY CODE       7.PROJECT TITLE HobIICROUP 3         S.PROJECT NUMBER       6.CATEGORY CODE       7.PROJECT NUMBER       8.PROJECT COST (5000)         3.PROJECT NUMBER       6.CATEGORY CODE       7.PROJECT NUMBER       8.PROJECT COST (5000)         7R IMARY FACILITY       0.COST ESTIMATES       0.COST       (5000)         CONSTRUCTION       5.SUPPORTING FACILITY       LS       0.SUPPORTING FACILITY         SUBTOTAL       CONTRACT COST       1.SOLVENT CONSTRUCTION       0.SUPPORTING FACILITY         SUBTOTAL       CONTRACT COST       1.SOLVENT CONSTRUCTION       1.SOLVENT CONSTRUCTION         SUPPORTING FACILITY       LS       I.SOLVENT CONSTRUCTION       1.SOLVENT CONSTRUCTION         ACTIVATED CARBON RECENERATION FACILITIES ENLARCED       I.SOLVENT CONSERSTRUCTION CONSTRUCTIONS	· · · · · · · · · · · · · · · · · · ·	۲۰ 		UNLY	(wirth D		<i>F.IN T.I</i> . <i>R</i>		· · · · · · · · · · · · · · · · · · ·	
ARMY       [45 JAN 63]         3.INSTALLATIOM AND LOCATION       4.PROJECT TITLE MobilGROUP 3         Badger Army Ambunition Plant       SOLVENT CONSERVATION C LINE         S.PROGRAM ELEMENT       6.CATEGORY CODE         226 80       9.COST ESTIMATES         178000000000000000000000000000000000000			• Do one one o no o							DATE
J. INSTALLATION AND LOCATION       4. PROJECT TITLE HobIICADUP 3         Badger Army Ambunition Plant       4. PROJECT TITLE HobIICADUP 3         SUBTOTAL       SOLVENT CONSERVATION CLINE         S. PROGRAM ELEMENT       6. CATEGORY CODE       7. PROJECT NUMBER         S. PROGRAM ELEMENT       6. CATEGORY CODE       7. PROJECT NUMBER         S. COST ESTIMATES       9. COST ESTIMATES         ITEM       U/M       GUANTITY       UNIT         CONSTRUCTION       LS       5. SUPPORTING FACILITY       COST         SUBTOTAL       CONTRACT COST       SUPPORTING FACILITY       LS       10.00%)         SUPPORTING FACILITY       LS       LS       10.00%)         TOTAL CONTRACT COST       SUPPORTING FACILITY       LS       10.00%)         TOTAL CONTRACT COST       SUPPORTING FROPOSEO CONSTRUCTION       10.00%)       10.00%)         NOTAL CONTRACT COST       SUPPORTING FROPOSEO CONSTRUCTION       10.00%)       10.00%)         IDTAL REQUEST		FY 19	<u></u> MILITARY C	ONST	RUCTIO	N PRO	JECT	ΔΤΑ		S JAN 83
Badger Army Ambunition Plant       SOLVENT CONSERVATION C LINE         S.PROGRAM ELEMENT       6. CATEGORY CODE       7. PROJECT CONSERVATION C LINE         S.COST ESTIMATES       9. COST ESTIMATES         UNIT COST (5000)         PROGRAM ELEMENT         S.COST ESTIMATES         UNIT COST (5000)         REMARKS         SUBTOTAL         CONTING FACILITY         UNIT COST         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUBTOTAL         SUBTOTAL         CONTING FACILITY         SUBTOTAL         SUBTOTAL<		ID LOC	ATION			. PROJEC		E Mob		
Visconsin       SOLVENT CONSERVATION C LINE         S. PROGRAM ELEMENT       6. CATEGORY CODE       7. PROJECT NUMBER       8. PROJECT COST (\$000)         224 80       9. COST ESTIMATES       9. COST ESTIMATES       10.00117       UNIT       COST (\$5000)         PRIHARY FACILITY       0.0117       US       0.0117       COST (\$5000)         CONSTRUCTION       LS       0.0117       COST (\$5000)         SUBTOTAL       CONTRACT COST       0.053       0.0011         SUBTOTAL       CONTRACT COST       0.053       0.0011         SUBTOTAL       CONTRACT COST       0.053       0.0011         SUBTOTAL       CONTRACT COST       0.053       0.053         SUBTOTAL       CONTRACT COST       0.053       0.053       0.053         SUBTOTAL CONTRACT COST       0.053       0.053       0.053       0.053         SUBTOTAL       CONTRACT COST       0.053       0.053       0.053       0.053         INSTALLED       FACILITY       0.053       0.053       0.053	Badger Army Amn	unit	ion Plant							
224 80         9. COST ESTIMATES         VIEM :       UVM QUANTITY UNIT COST (5000)         FRIMARY FACILITY         COST ESTIMATES         COST ESTIMATES         COST ESTIMATES         COST COST (5000)         SUBTOTAL         CONTRUCTION         SUBTOTAL         CONTACT COST         CONTACT COST         SUPERVISION INSE & OHEAD ( 5.00%)         TOTAL CONTRACT COST         SUPERVISION INSE & OHEAD ( 5.00%)         TOTAL CONTRACT COST         SUPERVISION INSE & OHEAD ( 5.00%)         TOTAL CONTRACT COST         SUPERVISION INSE & OHEAD ( 5.00%)         TOTAL CONTRACT COST         SUPERVISION INSE & OHEAD ( 5.00%)         TOTAL CONTRACT COST         INSTALLED EQUIPHENT-OTHER APPROP         IN CORCENTION FACILITIES ENLARCED         INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTL'.         ACTIVATED CARBON RECENERATION FACILITIES ENLARCED         DURING PROCESSING IN THE CREEN POWDER AREA. THE MODIFICATIONS VOULD INCL					2	SOLVEN	T CON	SERVA	TION C	LINE
9. COST ESTIMATES         ITEM :       U/M QUANTITY COST (GOO)         FRIMARY FACILITY CONSTRUCTION SUPPORTING FACILITY       LS       LS       LS         SUBTOTAL CONTING FACILITY       LS       LS       LS       LS         SUBTOTAL CONTING FACILITY       LS       LS       LS       LS         SUBTOTAL CONTING FACILITY       LS       LS       LS       LS         SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST       LS       LS       LS       LS         SUPPORTING FACILITY       LS       LS <t< td=""><td>5. PROGRAM ELEME</td><td>NT .</td><td>6. CATEGORY COD</td><td>E</td><td>7. PROJEC</td><td>TNUMB</td><td>ER</td><td>8. PRO</td><td>JECT COS</td><td>T (\$000)</td></t<>	5. PROGRAM ELEME	NT .	6. CATEGORY COD	E	7. PROJEC	TNUMB	ER	8. PRO	JECT COS	T (\$000)
9. COST ESTIMATES         ITEM       UUM       QUANTITY       UNIT       COST         ITEM       UUM       QUANTITY       COST         COST FACILITY         CONSTRUCTION         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUBTOTAL         CONTING FACILITY         SUPPORTING FACILITY         SUBTOTAL         CONTACT COST         SUPPORTING FACILITY         SUPTION CONTRACT COST         SUPPORTION FOR CONTACT COST         SUPPORTION OF PROPOSED CONSTRUCTION         ACTIVATED CONTRACT COST         SUPPORTION OF PROPOSED CONSTRUCTION         ACTIVATED CONTRACT COST         SUPPORTION OF PROPOSED CONSTRUCTION         ACTIVATED CONTRACT COST         INSTALLED COUPHENT-OTHER APPROP         INSTALLED COUPHENT-OTHER APPROP         INSTALLED COUPHE				4						
ITEM U/M QUANTITY UNIT COST (5000) FRIMARY FACILITY CONSTRUCTION SUFFORTING FACILITY SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUFEVISION INSP & OHEAD ( 5.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL CONTRACT COST INSTALLED EQUIPHENT-OTHER APPROP TO DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON RECENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTL' REHOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DUAING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSLLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEACE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDED OFERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL REAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
TREM       UM       CUANTIVY       COST       (5000)         TRIMARY FACILITY       CONSTRUCTION       LS       Ister to the state of the state o				9. COST	ESTIMATE	<u>s</u>	1	· ·		
CONSTRUCTION SUPPORTING FACILITY SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPHENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON RECENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POUDER DURING PROCESSING IN THE GREEN POUDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POUDER OPERATIONS AREA TO EXISTING ACTIVATED CAREON RECOVERY PLANT MAXIMUM RECOVERY INSTALL REAL RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATE CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.			ITEM			U/M	QUAN	TITY		
CONSTRUCTION SUFFORTING FACILITY SUBFORTING FACILITY SUBFORTING FACILITY SUBFORTING FACILITY SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLE EQUIPMENT-OTHER APPROP IN. OESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POUDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEV ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POVDEN OPERATIONS AREA TO EXISTING ACTIVATED CAREON RECOVERY PLANT MAXIMUM RECOVERY INSTALL REAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATE CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.	TRIMARY FACILIT	Y					<u> </u>			-
SUBTOTAL CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTL' REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POUDER DUAING PROCESSING IN THE GREEN POUDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POUDEI OFERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.						LS				
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAYIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.	SUPPORTING FACI	LITY				1				
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAYIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEV ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEV ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.						÷.				
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEV ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.						1				
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEV ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAYIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.	• 						ľ			
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDEN OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDED OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAYIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.								1		
CONTINGENCY PERCENT (10.00%) TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOVERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDEN OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.	SUBTOTAL									
TOTAL CONTRACT COST SUPERVISION INSP & OHEAD ( 5.00%) TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.		CENT	(10.00%)							
TOTAL REQUEST INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POVDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT VORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAYIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.										
INSTALLED EQUIPMENT-OTHER APPROP 10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POVDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.		5P & (	DHEAD ( 5.009	6)			1	·		
10. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS VOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.	TOTAL REQUEST									
ACTIVATED CARBON REGENERATION FACILITIES ENLARGED INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS. CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DENY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY FLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.							<u> </u>			<u> </u>
INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.	10. DESCRIPTION OF I	PROPOS	ED CONSTRUCTION							
INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.										
INCREASE CAPACITY OF THE ACTIVATED CARBON RECOVERY PLANT TO MORE EFFICIENTLY REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CAREON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REQUIREMENTS.	ACTIVATED CA	RBON	REGENERATION	FACIL	ITLES P	NLARG	ED			
REMOVE AND RECOVER THE ALCOHOL-ETHER VAPORS THAT EVAPORATE FROM THE POWDER DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARPON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.								т то	MORE E	FFICIENTLY
DURING PROCESSING IN THE GREEN POWDER AREA. THE MODIFICATIONS WOULD INCLUDE BUT NOT BE LIMITED TO INSTALLATIONS OF NEW ABSORBERS, CONDENSERS, BLOWERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CAREON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.										
BLOVERS, DUCT WORK AND ACCESSORIES. MINIMIZE USEAGE CONSTRUCT REQUIRED BLOVER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT MAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.										
MINIMIZE USEAGE CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.	BUT NOT BE LIMI	TED 1	O INSTALLATIO	DNS OF	NEV A	SORBE	RS, C	ONDEN	ISERS,	
CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.	BLOVERS, DUCT VO	RK AI	ID ACCESSORIES	5.	· · ·					
CONSTRUCT REQUIRED BLOWER AND VAPOR DUCT SYSTEM TO CONNECT DEHY FRESS POWDER OPERATIONS AREA TO EXISTING ACTIVATED CARBON RECOVERY PLANT HAXIMUM RECOVERY INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATED CARBON RECOVERY PLANT TO REDUCE ENERGY REGUIREMENTS.									÷ 1	
OPERATIONS AREA TO EXISTING ACTIVATED CAREON RECOVERY PLANT Haximum recovery Install heat recovery system to solvent condensers in the enlarged activated Carbon recovery plant to reduce energy reguirements.								*** *		
HAXIMUM RECOVERY Install heat recovery system to solvent condensers in the enlarged activated Carbon recovery plant to reduce energy reguirements.									LIII I'R	rss PUWUCK
INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATES CARBON RECOVERY PLANT TO REDUCE ENERGY REGULREMENTS.	OI ENALIONE AREA		AIDING ACTIV		UNNEUN	A 2 C 0 V	Ent i	67.172		
INSTALL HEAT RECOVERY SYSTEM TO SOLVENT CONDENSERS IN THE ENLARGED ACTIVATES CARBON RECOVERY PLANT TO REDUCE ENERGY REGULREMENTS.	HAXIMUM RECO	VERY								
		-	Y SYSTEM TO S	OLVEN	T CONDI	ENSERS	IN T	HE EN	ILARGED	ACTIVATED
11 REQUIREMENT: SF ADEQUATE: SF SUBSTD SF	CARBON RECOVERY	PLAN	T TO REDUCE E	NERGY	REGUI	REMENT	S.			
11 REQUIREMENT: SF ADEQUATE SF SUBSTD SF		<u>-</u>								
	11. REQUIREMENT	:	SF J	DEGUN	TE:	٠	SF	SVB	ISTD	SF
							· · · ·			
									·.	•
	· · ·									

٠

,

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH N DATA IS ENTERED)

EXHIBIT I-O ENVIRONMENTAL FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

· ·

	F	OR OFFICIAL	USE ONL	Y (WHEN	I DATA IS	ENTE	REDJ			
1. COMPONENT	Γ							2	OATE	
	FY 19	17 MILITAR	Y CONS	TRUCTI	ON PRO	JECT	DATA			
ARMY									95 JA	N 83
J. INSTALLATION	AND LOC	ATION			4. PROJE	CT TITL	E Mob	i I GRO		
Badger Army A	munit	ion Plant								
Visconsin					SOLVEN	T CON				
5, PROGRAM ELEN	AENT	6. CATEGORY	CODE	7. PROJ	ECT NUMB	ER	8. PR	D 1 D J E C T C	OST (SO	00)
		226 8		L						
			9. COS	T ESTIMA	TES					
		ITEM			U/M	QUAN	TITY	COST		COST (\$000)
						<b> </b>		cusi		(3000)
PRIMARY FACIL										
CONSTRUCTION					LS					
SUPFORTING FA	CILITY						1.1			
						ł				
						ł			l l	
						ł				
						}				
SUBTOTAL										
CONTINGENCY P	FRCENT	(10 00%)								
TOTAL CONTRACT	•					1			1	
SUPERVISION I		OHEND ( 5.	00%)			ł				
TOTAL REQUEST						1			ţ	
INSTALLED EQU	IPHENT	-OTHER APPR	02							
10. DESCRIPTION O	FPROPOS	SED CONSTRUCT	TION	*****				-		
4										
ACTIVATED										
INCREASE CAPA										
REMOVE AND RE	COVER	THE ALCOHOL	-ETHER	VAPORS	THAT E	VAPOR	ATE I	ROM T	THE PO	DVDER
OURING PROCES										
BUT NOT BE LI			ATIONS	OF NEW	ADSORB	ERS,	CONDI	ENSERS	i, 8L(	JVEN3,
DUCT WORK AND	ACCES	SORIES								
		<b>*</b> 10								
HINIMIZE U								neuv t		FOURFR
CONSTRUCT REQUERATIONS AR								JEAL	- R E J J	TOWDER
UPERALIUNS AR	EA LUI	CAISIING AC	II VALED	CANDO	A ACCOV	EAT F	L			
11. REQUIREMEN	NT	SF	ADEQU	ATE		SF	SU	STD:	9	57
	· - • •	5.								
		· .								
		•								
	•	•								
		-								
									-	

DD FORM 1391

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WIII N D IT.) IS ENTIFIED

F	OR OFFICIAL U		SIT I-P	DATA IS	BADGI ENVII ENTEREDI		ASSESSMI
1. COMPONENT						2. 0.	ATE
FY 19	MILITARY		RUCTI	ON PROJ	IECT DAT	A	
ARMY 3. INSTALLATION AND LOC	ATION				TTITIE	DEILGROUP	JAN 83
Badger Army Ammunit							5
Visconsin				SOLVEN	T CONSER	ATION	LINE
5. PROGRAM ELEMENT	6. CATEGORY C	ODE	7. PROJ	ECT NUMBE	R 8. PI	OJECT COST	(\$000)
	2 2 6 8 0	· · · · · · · · · · · · · · · · · · ·	<u> </u>			······	
	i	9.0051	ESTIMA			UNIT	соят
	ITEM			U/M	QUANTITY	COST	(\$000)
ERIMARY FACILITY		•	<u></u>			1	1
CONSTRUCTION				LS			
SUPPORTING FACILITY							
					•		
							1
					1		
UBTOTAL							
ONTINGENCY PERCENT							
TOTAL CONTRACT COST Supervision insp 4							
TOTAL REQUEST	UNERD ( J.	/					
INSTALLED EQUIPMENT	-OTHER APPRO	JP.					
10 000000000000000000000000000000000000	SED CONSTRUCT	ON				1	<u>L</u>
10. DESCRIPTION OF PROPO							
MAXIMUM RECOVERY MAXIMUM RECOVERY INSTALL HEAT RECOVE CARBON RECOVERY PLA MINIMIZE USAGE CONSTRUCT REQUIRED OPERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and V	E ENERG	Y REQU Uct sy	IREMENTS	S CONNECT	DEHY PRI	
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Construct Required IPERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and V	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI	
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize USAGE ONSTRUCT REQUIRED PERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Onstruct Required Perations Area to	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Onstruct Required Perations Area to	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Onstruct Required Perations Area to	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Onstruct Required Perations Area to	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Onstruct Required Perations Area to	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize USAGE ONSTRUCT REQUIRED PERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize USAGE ONSTRUCT REQUIRED PERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDI
MAXIMUM RECOVERY NSTALL HEAT RECOVE ARBON RECOVERY PLA MINIMIZE USAGE ONSTRUCT REQUIRED	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDE
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Construct Required IPERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDE
MAXIMUM RECOVERY NSTALL HEAT RECOVE Arbon Recovery Pla Minimize Usage Construct Required IPERATIONS AREA TO	RY SYSTEM TO NT TO REDUCE Blower and v Existing act	E ENERG Vapor d Fivated	Y REQU UCT SY Carbo	IREMENTS	S Connect Ery plan	DEHY PRI F.	ESS POVDE

.

DD FORM 1391

;

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH N DATA IS ENTIRED)

#### EXHIBIT I-Q FOR OFFICIAL

BADGER AAP

	F	OR OFFICIAL L	EXHIB	VIT I-Q Y (WHEN	DATA	is i	ENV ENTERE	IRONM	IENTAL	ASSESS	MENT
1. COMPONENT	FY 19	MILITARY	CONST	TRUCTI	ON PF	roı	IECT D	ΑΤΑ	2. DA 0 6	JAN 8	3
3. INSTALLATION Badger Army A Visconsin									IGROUP	3	
5. PROGRAM ELEM	ENT	6. CATEGORY C		7. PROJI	ECT NU	MBE	R	B, PROJ	ECT COST	(\$000)	
			9. COS	T ESTIMA	TES						
		ITEM			U	/M	QUANT	ודע	COST	COS (\$000	
PRIMARY FACIL Constructio Supporting FA	N				L	.5					
				. <sup></sup> .							
SUBTOTAL CONTINGENCY P TOTAL CONTRAC SUPERVISION I TOTAL REQUEST INSTALLED EQU	T COST NSP 4 1 PMENT	OHEAD ( 5. -OTHER APPR	OP								
ENERGY REC INSTALL HEAT CARHON RECOVE SOLVENT RE LARGE AMOUNTS HARDENING-SCR C.O.D. CONTEN RECOVER AND F	OVERY RECOVE RY PLA COVERY OF SO EENING T OF B	RY SYSTEM T NT TO REDUC LVENT IS DI OPERATION AAP'S DISCH	O SOLVE E ENERC Scharge of the Arge	ED TO T Fall P Facil	TREME THE IN YOWDER	ENT: NDU R A	STRIAI Rea, I	. FLO NCRE	WAGE FF Asing E	юн ті! 1.0.d.	C
11. REQUIREME	NT	SF	ADEOU	JATE :			SF	SUB	STD	SF	
											•
• • • • •		• • • • •								•	

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WILL N D 1T.1 IS ENTERED)

	EXHIBIT	I-R	ENVIR
FOR OFFICIAL	USE ONLY /W	III.N DATA	IS ENTERED)

.

I. COMPONENT									DATE	
ARMY	FY 19	<u>_9</u> 9MILIT	ARY CON	STRUCT	ION PRO	JECT	DATA	1	6 JAN	я <b>т</b>
3. INSTALLATION	AND LOC	ATION			4. PROJE	CT TITL	E Mot	IGROU		<u>v -</u>
adger Army A	maunit	ion Plan	t							
I SCORSIA S. PROGRAM ELEM	MENT	S CATEGO	RY CODE	17 990	OLD AC				<u> </u>	
		0. 041 600	UNT CODE	1					31 (3000)	
		77	<u>A 12</u>							•
				OST ESTIMA	TES					
		ITEM			U/M	QUAN	TITY	UNIT COST		ST 001
RIMARY FACIL	ITY							-		
CONSTRUCTIO					LS					
UPPORTING FA	CILITY									
								1	1	
					1	1				
					` <b> </b>	1			1	
						1				
UBTOTAL									· [	
						1			i	
		(10.00%	i)		. <u> </u> -	1 .			1	
OTAL CONTRAC	T COST									
OTAL CONTRAC Upervision I	T COST							н. -		
ONTINGENCY P OTAL CONTRAC UPERVISION I OTAL REQUEST NETALLED EQU O. DESCRIPTION O URCHASE AND	T COST	OHEAD	S. 00%) PPROP RUCTION	SS LINEI	D LIME S	5110.	20'-	0 DIA	x 40'-	- 0
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTALLED EQU</u> O DESCRIPTION O URCHASE AND I CH. MOUNTED , SO& CUBIC F ONVEYER HAVI I SCHARGE INT	T COST NSP & <u>HIPHENT</u> DF PROPOSI INSTAL O ON 16 EET OF NG 100 TO PRES	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP RUCTION EEL, GLA OF STEEL LIME. DI EET PER ATION SY	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	SION TVIN Capae	SYST I SCR ILE O	EM, SII Ev feei F conti	LO TO S Der Rolled	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTAILED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP RUCTION EEL, GLA OF STEEL LIME. DI EET PER ATION SY	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	SION TVIN Capae	SYST I SCR ILE O INSTA	EM, SII Ev feei F conti	LO TO S Der Rolled	
OTAL CONTRAC UPERVISION I OTAL REQUEST NATALLED EQU O. DESCRIPTION O URCHASE AND IGH, MOUNTED , SO& CUBIC F DNVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST NATALLED EQU O. DESCRIPTION O URCHASE AND IGH, MOUNTED , SO& CUBIC F DNVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
DTAL CONTRAC JPERVISION I DTAL REQUEST <u>STALLED EQU</u> D. DESCRIPTION O JRCHASE AND IGH, MOUNTED , SO& CUBIC F DNVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST NATALLED EQU O. DESCRIPTION O URCHASE AND IGH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST NATALLED EQU O. DESCRIPTION O URCHASE AND IGH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST NATALLED EQU O. DESCRIPTION O URCHASE AND IGH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD <u>-Other A</u> Ed Constr L ONE ST Points Pebble Cubic E Ent Agit	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTALLED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO4 CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTALLED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO4 CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTAILED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTAILED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTAILED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO& CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST <u>NSTALLED EQU</u> O. DESCRIPTION O URCHASE AND ICH, MOUNTED , SO4 CUBIC F ONVEYER HAVI ISCHARGE INT EEDERS AND S	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	
OTAL CONTRAC UPERVISION I OTAL REQUEST NSTALLED EQU 0. DESCRIPTION O	INSP 4 INSP 4 INSP 4 INSTAL D ON 16 EET OF ING 100 TO PRES SHAKERS	OHEAD OTHER A ED CONSTR L ONE ST POINTS PEBBLE CUBIC E ENT AGIT	S.00%) PPROP Ruction Teel, gla of steel Lime. di Teet per Tation sy T NO. 42	SUPPORT Scharge Hour Cai Stem. Pu	F SUSPEN System, Pacity,	ISION TVIN CAPAE AND I	SYST I SCR ILE O INSTA	EM, SI EV FEEL F Conti LL (2)	LO TO S Der Rollep Lime	

٠

.

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WIFN DATA IS ENTERED)

.

## BADGER AAP EXHIBIT I-S ENVIRONMEN

	F	OR OFFIC	IAL USE ONLY					IENTAL AS	SSESSMENT			
1. COMPONENT	EY 19	9 96411 17	TARY CONST	PUCTU			<u></u>	2. DA	TE			
ARMY	1 1 13		ANT CONST	RUCIN					JAN 83			
3. INSTALLATION					4. PROJEC	ROJECT TITLE MobilGROUP 3						
Badger Army A	mmunit	ion Plan	nt									
Visconsin 5. PROGRAM ELEN		E CATEC	DRY CODE	7 9901	OLD AC			ARH DIKI				
J, PROGRAM CEEN		0. CATEG	SAT CODE	1. 1. 1. 1.			0		(3000)			
		2 2	26 17									
		· · · · · · · · · · · · · · · · · · ·	9. COS1	ESTIMAT	TES							
		ITEM			U/M	QUANT	TITY	UNIT COST	COST (\$000)			
PRIMARY FACIL	ITY		······									
CONSTRUCTIO	N				LS							
SUPPORTING FA	CILITY											
1												
ł.									:			
1						<b>1</b> .	1		ан сан сан сан сан сан сан сан сан сан с			
SUBTOTAL												
CONTINGENCY P	ERCENT	(10 00%	6.)									
TOTAL CONTRAC	T COST											
SUPERVISION I	NSP &	OHEAD	(5,00%)									
TOTAL REQUEST						1						
INSTALLED EQU						I			L			
INSTALL CONCR				AL REGI	ULATION	40 CF	R 11	Z-7, Ρλ	RAGRAPH			
(E) (2) (II),	AROUN	D ALL TA	NKS, ACCOU	NT 708	- TANK	S 90,9	1. 7	722 - TX	NK 80;			
711 - TANKS 7		-										
TANKS 34,35,3	-											
62,63,64,65 I Concrete dixe												
THE STORACE T												
SOUTH OF BUIL												
WILL HAVE VEH			THE EAST A	ND WEST	r sides	, WITH	[ 5T]	LES TO	UNLOADING			
DOCKS ON NORT	H AND	SOUTH.										
11. REQUIREME	NT	<u></u>	SF ADEOU	ATE		SF	SVI	ISTO	SF			
l i i i i i i i i i i i i i i i i i i i												
ł												
1												
ł												
L												

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH DATA IS ENTIFIED)

	FC		IAL LISE	EXHI	BIT I-	T	71 IS	E	NVIR	R AAP Onmen		ASSESS
1. COMPONENT						- 2771				T	2. DA	TE
	FY 19_	<u>99</u> MILIT	ARY C	ONS	TRUCT	ION	PRO.	IECT	DAT	x		in the second se
ARMY						4. P	BOJEC	TTITL	E Moh	1108		JAN 83
Badger Army Amm	-		t						- 1100		001	•
Visconsin								AR CL				
5. PROGRAM ELEME	NT	6. CATEGO	DOD YR	E	7. PROJ	IECT I	NUMBE	ER	8, PR	OJECT	COST	(\$000)
		77	6 1 2									
	ł			9. COS	T ESTIMA	TES						
		ITEM			· · · ·		U/M	QUAN	ITITY			COST (\$000)
PRIMARY FACILIT	. <b>Х</b>		Ŧ									
CONSTRUCTION							LS					
SUPPORTING FACT	LITY											
				÷.,								
										ł		
								-				
										1		
SUBTOTAL												
CONTINGENCY PER	CENT	(10 00K	•							1		t i i i i i i i i i i i i i i i i i i i
			)							l		
TOTAL CONTRACT	COST			.,				1. A. A.				
FOTAL CONTRACT Supervision ins	COST			• )								
FOTAL CONTRACT SUPERVISION INS FOTAL REQUEST INSTALLED EQUIP 10. DESCRIPTION OF	COST	HEAD ( OTHER A ED CONSTR	5.00% PPROP		FACILI	TY	RATI	ROAD	TYPI		IK CJ	ARS )
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	ING	CAPABL Em, ne	EOF	г ноч	IS I NG	ONE Ateri	TANK	C C A I	R. SUMP
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( Other A Ed constf Ank Car E A New	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT Supervision ins Total request Installed equip	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP RUCTION CLEAN BUILD CTION	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP Ruction Clean Build Ction	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other
TOTAL CONTRACT SUPERVISION INS TOTAL REQUEST <u>INSTALLED EQUIP</u> 10. DESCRIPTION OF CONSTRUCT (1) A FACILITY WILL I PUMPS, CATWALKS EQUIPMENT.	COST P & O MENT PROPOSI CID T. NCLUD . FUM	HEAD ( OTHER A ED CONSTE ANK CAR E A NEW	S.00% PPROP Ruction Clean Build Ction	INC ING Syst	CAPABL Em, ne	EOF	г ноч	ISING Ng M	ONE Ateri	TANK	C C A I	R. SUMP Other

t

EXHIBIT I-U FFICIAL USE ONLY (WHEN DATE IS EN

:

1. COMPONENT										1 2	DAT	E
	FY 19	MIL	ITARY	CONST	FRUCTI	ON PR	OJEC	ст ри	ATA			
ARMY ARMY		ATION			······	1 4 480	CCT T					JAN 53
			4			4. PRO.				IGRO	IUP :	3
ladger Army Am lisconsin		ion Pl				Hoder		2. 203	LER.	HOUSI		2
5. PROGRAM ELEMI	ENT	6. CATE	GORY CO	OE	7. PROJ	ECT NUN	BER	8	. PRO	ECT C	OST (	(0002
		ļ										
		L	<u>871 20</u>	9. COS	T ESTIMA	TES		k				
		ITEM		1		υ/	M ai	JANTI	TY	UNIT COST		COST (5000)
RIMARY FACILI	ITY	· .										
CONSTRUCTION						L						
UPPORTING FAC	CILITY											
			1									
							I					
UBTOTAL												
ONTINGENCY PI	ERCENT	(10.0	10%)		•							
CONTINGENCY PI	r cost	,		A 14 1								
	r cost	,		0%)	×							
OTAL CONTRACT	T COST NSP 4 Lement	он <b>ел</b> о 	( 5.0	<u>P</u>								
OTAL CONTRACT UPERVISION IN OTAL REQUEST NSTALLED FOUL O. DESCRIPTION OF NSTALL POLLUT OVERHOUSE NO	T COST NSP & IPMENT FPROPO TION A . 2, B	OHEAD <u>-Othe</u> s Sed com Bateme ILDG 4	( S.O <u>Appro</u> Structio NT ON 538. T	P DN FOUR His W	ILL INC	CLUDE	/HR. 4 SC	RUBB	ERS.	4 F	BOIL	4 NE
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> 0. DESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD OTHER SED COM BATEME ILDG - 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T ITVORK MB	P FOUR HIS W AND EC	ILL ING DUIPMEN JATE:	LUDE (T	HR. 4 SC	RUBB MB	ERS.	4 F STD:	BOIL	ERS AT 4 Nev Mb
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQU</u> ODESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD OTHER SED COM BATEME ILDG - 4 ED DUC	( 5.0 <u>APPRO</u> STRUCTIO INT ON 538. T. TWORK MB	P FOUR HIS V AND EC	ILL ING DUIPMEN JATE:	LUDE (T	/HR. 4 SC	RUBB MB	ERS.	4 F STD:	BOIL ANS	4 NEV
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQU</u> ODESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD OTHER SED COM BATEME ILDG - 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T ITVORK MB	P FOUR HIS V AND EC	ILL ING DUIPMEN JATE:	LUDE (T	/HR. 4 SC	RUBB MB	ERS.	4 F STD:	AN5 .	MB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQU</u> ODESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD OTHER SED COM BATEME ILDG - 4 ED DUC	( 5.0 <u>APPRO</u> STRUCTIO INT ON 538. T. TWORK MB	P FOUR HIS V AND EC	ILL ING DUIPMEN JATE:	LUDE (T	4 SC	RUBB MB	ERS.	4 F	AN5 .	MB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQU</u> ODESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD <u>-OTHER</u> SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON SJ8. T TWORK MB	P FOUR HIS W AND EC ADEQU	ILL ING DUIPMEN JATE:	LUDE (T	4 SC	RUBB MB	ERS.	4 F	AN5 .	MB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED FOU</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD -OTHER SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T TVORK MB	P FOUR HIS W AND EC	ILL ING DUIPMEN JATE:	2LUDE (T.	4 SC	RUBB MB	ERS.	4 F	AN5 .	MB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED FOU</u> O. DESCRIPTION OF NSTALL POLLUT OVERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD -OTHER SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T TVORK MB	P FOUR HIS W AND EC	ILL ING DUIPMEN JATE:	2LUDE (T.	4 SC	RUBB MB	ERS.	4 F	AN5 .	HB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED FOU</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD -OTHER SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T TVORK MB	P FOUR HIS W AND EC	ILL ING DUIPMEN JATE:	2LUDE (T.	4 SC	RUBB MB	ERS.	4 F	AN5 .	HB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED FOU</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T. TWORK MB	P FOUR HIS W AND EC ADEQU	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>ANS</b> .	MB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED FOU</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T TVORK MB	P FOUR HIS W AND EC ADEQU	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Ν5 .	A NEV
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD -OTHER SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T. TWORK MB	P FOUR HIS W AND EC ADEQU	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Ν5 .	HB
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T. TWORK MB	P FOUR HIS W AND EC ADEQU	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Νς .	MB
OTAL CONTRACT SUPERVISION IN OTAL REQUEST <u>NSTAILED FOUL</u> O. DESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	T COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT	OHEAD SED COM BATEME LDG & ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T. TVORX MB	P FOUR HIS V AND EC ADEQU	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Ν5 .	4 NE4
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT NT:	OHEAD SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON ISJ8. T TVORK MB	P FOUR HIS W AND EC	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Νς .	A NEW
OTAL CONTRACT UPERVISION IN OTAL REQUEST <u>NSTALLED EQUI</u> ODESCRIPTION OF NSTALL POLLUT OWERHOUSE NO TACKS AND ASS 1 REQUIREMEN	I COST NSP & IPMENT FPROPO TION A . 2, B SOCIAT NT:	OHEAD SED COM BATEME LDG 4 ED DUC	( S. 0 <u>APPRO</u> STRUCTIO INT ON S 38. T. TVORX MB	P FOUR HIS W AND EC	ILL ING	2LUDE (T	4 SC	RUBB MB	ERS.	4 F	<b>λ</b> Νς .	MB

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED FOR OFFICIAL USE ONLY (WITH N DATA IS ENTERAD)

## EXHIBIT II-A ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TE-E-81-01

Title: Develop Methods for Treatment and Disposal of Pollutant Contaminated Sludge/Sediment Deposits

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During the production of single base and double base propellants, areas that received contaminated process waters now contain accumulated sediments and sludges which need to be treated and safely disposed of.

A number of the raw materials used in the manufacture of propellants at Badger AAP are listed as hazardous or toxic, and/or conventional contaminants. Continued leaching and washing action by surface waters could move any contaminants present into the groundwater system. Nitrate levels exceeding 10 ppm have been detected in one of the monitoring wells in this area.

Project is required to comply with Wisconsin Administrative orders or permit conditions.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

SW-1: Select and mark all sampling sites.

- SW-2: Determine the level of contamination by an in-depth soil sampling and analysis program.
- SW-3: Conduct a literature search for a review on the "State of the Art" in sediment and sludge disposal technology.
- SW-4: Select potential disposal methods for preliminary bench scale investigations.

3. Estimated schedule to perform work - tasks by months required:

Literature Search- Three monthsLaboratory Test- Three monthsDisposal Method Selection- Three monthsDisposal Method Investigation- Twelve monthsFinal Report- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 Two year project funding will be required.

#### EXHIBIT II-B ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-80-2A

Title: Divert Storm WAter at Badger AAP to Off-Plant Drainage Systems: Part I - Preliminary Concept Design

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Stormwater generated within BAAP's boundaries is collected and discharged through the General Purpose Sewer. The amount of this "clear water" entering the sewers must be minimized in order to allow proper treatment of the industrial wastewater. The General Purpose Sewer effluent must comply with provisions of the Federal Clean Water Act (PL 92-500) and with the State of Wisconsin WPDES permit.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

This project phase involves the preliminary survey and conceptual engineering design of the drainage channels within BAAP's boundaries and to develop the basis for a detailed design of diversion systems and a ROM cost estimate for the actual construction phase. This preliminary concept will be presented to the Wisconsin Department of Natural Resources for their review and/or approval and to initiate the first phase of necessary premit application. 3. Estimated schedule to perform work - tasks by months required:

Conduct on-Site Survey Develop Preliminary Project Plans Review Available Soil Borings Preliminary Design & Report

- . . . .
- One month - One month
- One month
- Two and one-half months
- the and one hart months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

This project will be conducted and administered by Olin Corporation Project Engineers. The preliminary and final reports will be accepted by Olin and COR Staff personnel.

5. Estimated overall project life: (One- or two-year funding)

This project will require one year project funding.

## EXHIBIT II-C ENVIRONMENTAL PROJECTS

#### Facility:

## GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBTW-E-82-08

Title: Evaluate Treatment Technology to Remove Phthalate Esters and Amines from Wastewater Streams

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During production of Single Base and Double Base propellants, areas that received contaminated process water now contain accumulated sediments/ sludges which need to be removed for treatment and/or disposal. The sediments/sludges may contain significant levels of toxic or hazardous phthalate esters and/or amines that were present in the plant wastewater during production periods that will continue to be leached into the groundwater of the State if the contaminated soil is not removed. The removal and proper disposal of contaminated sediment/sludges would prevent continued leaching into the subsoils, and permit lining of drainage ditches and sedimentation ponds prior to plant operation if reactivation is required. Treatment of wastewaters to remove the phthalates esters and amines during future production periods is essential to prevent contamination of the waters of the State of Wisconsin. The project is required to comply with Wisconsin Administrative orders or permit conditions.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

The study would consist of:

- SW-1: A literature search of disposal technology.
- SW-2: Direct coordination with vendors to review installed and ongoing systems.
- SW-3: Bench scale evaluation of a system adaptable to BAAP's pollutants.
- SW-4: Write a final report.

#### 3. Estimated schedule to perform work - tasks by months required:

Literature Search Vendor Coordination Procurement Bench Scale Equipment Lab evaluation Final Report

- Two months - Three months - Three months
- Thirteen months
- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

5. Estimated overall project life: (One- or two-year funding)

The project will require two years of funding.

#### EXHIBIT II-D ENVIRONMENTAL PROJECTS

JUN 1983 BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No: TBW-E-83-05

Title: Diversion of Off-Site Generated Storm Water from the Thermal Treatment (Open Burning) Sites at the Burning Grounds

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Storm water generated off-site flows across the Thermal Treatment sites at the Explosives and Propellant Burning Grounds dissolving soluble components from residuals remaining after treatment. The flow continues off-site and percolates into the ground and potentially may contaminate the groundwaters of the State of Wisconsin.

Both the Resource Conservation and Recovery Act (PL 95-580), and the State of Wisconsin Statutes Section 144.76(7)(c) and NR 181.44(10)(j)(k)(1) and (m) specify that "diversion structure shall be constructed such that surface water run-on. will be prevented from entering the site or facility".

- Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: The Subcontractor shall prepare an engineering analysis including a water balance to determine the worst condition flow situation and prepare a written report complete with topographic drawings of work to be performed in SW-2.
  - SW-2: The Subcontractor shall construct diversion ditches along the uphill slopes of the Burning Grounds to intercept storm generated surface water and drain the collected water to existing open fields below the treatment site.
  - SW-3: The Subcontractor shall uniformly smooth grade, fill, and compact all areas covered by this project and replace topsoil to a minimum depth of four inches. Before reseeding the disturbed areas, the topsoil shall be thoroughly tilled to a depth of three inches. The disturbed and reworked areas shall be reseeded with drill seeding equipment designed to fertilize and seed winter rye and grass seed on one pass. Mulching materials may be applied at the discretion of the Subcontractor to ensure seeding success and to minimize erosion.

- 2. SW-4: After completing the final grading and seeding, the Subcontractor shall remove all of his equipment and materials and restore the area to the general state of condition that existed before the start of the work. The Subcontractor shall maintain the area for a epriod of one year after seeding, during which time he shall restore crop eroded areas promptly and ressed in case of seeding failure.
  - SW-5: The Subcontractor shall prepare a Final Report complete with "As-Build" drawings of the work performed.
- 3. Estimated schedule to perform work tasks by months required:

Preliminary engineering	- One month
Prepare subcontract specifications	- One month
Request for quotations	- Two months
Evaluate quotations	- Two weeks
Award subcontract	- One month
Subcontractor mobilization	- Two weeks
Subcontractor on-site work	- Two months
Subcontractor Final Report	- Two months
BAAP review & acceptance of	
Final Report	- Two months
ELAPSED TIME	- Twelve months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and shall make necessary corrections and/or adjustments to the Subcontract as indicated by the daily inspections.

All work shall be done in a manner consistent with good workmanship and technical expertise of the Engineering and Construction profession.

5. Estimated overall project life: (One- or two-year funding)

Project work can be completed within two years of funding.

## EXHIBIT II-E ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### . .

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-04

Title: Removal of Accumulated Sludge and Neutralized Acid from the Pond Near the New Acid Complex

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

During the Startup and Proveout of the various acid production facilities in the New Acid Area, acidic wastes and spills were neutralized and stored in this unlined pond. The high nitrate and sulfate-laden wastes are leaching into the subsurface soil and reaching the groundwaters of the State of Wisconsin. Wisconsin Administrative Code NR 180 and 181 prohibit contamination of the groundwaters by hazardous wastes. Removal of this localized site of accumulated neutralized acids and sludges is required to prevent further contamination of the groundwaters of the state. The wastes can then be landspread in other areas of the plant where vegetation can make use of the chemicals present.

- 2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: The Subcontractor shall prepare and submit detailed before, during, and after topographic drawings of the wastewater pond and surrounding areas. Photographs (8" x 10") shall also be prepared of the subject area. These photographs shall be of such professional quality as to protray the actual restoration work that occurred.
  - SW-2: The Subcontractor shall excavate the dikes and accumulated sludge from the New Acid Complex Wastewater Pond to a depth of three (3) feet and landspread it in a designated area at a rate such that deposition of the sludge shall not exceed 150 pounds of NO3-N per acre equivalent. Actual soil equivalent shall be specified by the U.S. Army Environmental Hygiene Agency (USAEHA) and/or the Wisconsin Department of Natural Resources (WDNR).
  - SW-3: The Subcontractor shall restore the topography of the area to its original status prior to the formation of the wastewater pond and its demolition as part of this subcontract. The restoration shall include back filling the area with available clay-type subsoils, compaction of the back-filled area to 90% vector, covering the site with light (8-inches) of compacted topsoil, and finishgraded to existing topography
  - SW-4: The Subcontractor shall reseed the restored area, using grass seed mix equivalent to Wisconsin Highway Department Mix No. 3, and a cover crop of winter rye to protect the seeding effort.

3. Estimated schedule to perform work - tasks by months required:

Prepare Subcontract Specifications	- One month
Request quotations	- One month
Evaluate quotations	- Two weeks
Award Subcontract	- One month
Subcontractor mobilization	- Two weeks
Subcontractor on-site work - demolition	- Two weeks
Subcontractor on-site work - restoration	- Two weeks
	<b></b>
Subtotal - Elapsed time	- Five months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and make corrections and/or adjustments to the subcontract as needed as a result of field inspections and soil sampling.

The Project Engineer shall issue a Final Report covering the work done complete with before and after drawings and photographs.

5. Estimated overall project life:

Project work can be completed within one year of funding.

## EXHIBIT II-F ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL ASSESSMENT

## GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Facility:

#### Project No.: TB-E-81-02

Title: BALL POWDER Wastewater Pollution Abatement Study

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Phthalate esters are listed on the Toxic Pollutant List included in PL 92-500 under Part 307. Di-n-butyl phthalate (DBP), a phthalate ester, is used in the manufacture of BALL POWDER. Diphenylamine, utilized as a stabilizer in BALL POWDER, is toxic to aquatic organisms and reacts with degradation products of nitrate ester explosives to form N-Nitrosodiphenlyamine. The U.S. Environmental Protection Agency has designated N-Nitrosodiphenylamine a priority pollutant and is setting limits on the discharge levels permitted for these pollutants in wastewater, sludge, landfill leachate, etc. The contaminated wastewater stream generated in the production of BALL POWDER would contain these pollutants plus ethyl acetate, sodium sulfate, animal protein, nitroglycerin, and possibly dinitrotoluene. The Clean Water Act requires the application of the best available, economically achievable technology (BAT), which furthers the national goal of zero discharge of pollutants.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

This project will consist of the following tasks to be completed in a two year period beginning with receipt of funding.

- a. A detailed review of related studies and surveys to characterize treatability of propellant waste streams conducted at Badger or other propellant processing plants will be completed to utilize any available data applicable to this study.
- b. Characterize the BALL POWDER processing effluent to identify and determine specific concentration of individual propellant additives.
- c. Determine effluent guidelines from current regulatory requirements.
- d. Identify candidate treatment/recovery methodologies for potential testing by review of known biotreatment and physical/chemical processes, i.e., activated sludge, sedimentation, air stripping, ultrafiltration, reverse osmosis, ion exchange, activated carbon adsorption, polymeric resin adsorption, ozone oxidation, anaerobic/aerobic rotating biological contactor, biological denitrification.

2. Continued

BADGER AAP

- e. Select from task (d) the treatment systems for bench scale evaluations.
- f. Design, procure, install bench scale aparatus and conduct test program to evaluate selected technology.
- g. From results of task (f) select technologies for pilot scale evaluation.
- Design and construct selected pilot scale treatment facilities for h. evaluation of treatment/recovery methodologies and efficiencies.
- i. Conduct pilot scale testing to assess viability and optimum operating conditions for the prototype facilities.
- Perform economic feasibility analysis on those systems that functioned j. successfully.
- k. Perform a hazard analysis on systems selected in task (j).
- Estimated schedule to perform work tasks by months required: 3.
  - Characterize Effluent and Select Candidate Treatment/ a. Recovery Methodologies
    - (1) Literature Search
    - (2) Effluent Characterization
    - (3) Identify Candidate Methodologies
    - (4) Develop Bench Scale Test and Evaluation Plan
  - b. Bench Scale Evaluations of Selected Treatment/ Recovery Methodologies
    - (1) Design, Procure and Install Bench Scale Test Apparatus
    - (2) Conduct Bench Scale Tests
    - (3) Select Technologies for Pilot Plant Scale Evaluation
    - (4) Conduct Safety Site Submission and Hazard Analysis
  - c. Pilot Scale Evaluation of Selected Treatment/Recovery Technologies

(1) Design, Procure and Install Pilot Scale Equipment

- (2) Operate Pilot Plant
- (3) Evaluate Treatment/Recovery Technologies and Economic Analysis
- (4) Final Report and Recommendations
- Inspection/Acceptance Criteria for work completion: (Who, what, and how) 4. Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.
- 5. Estimated overall project life: (One- or two-year funding) Project work can be completed in three years.

14 months

18 months

4 months

#### EXHIBIT II-G

#### ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBTW-E-82-07

Title: Conduct a Study for Monitoring DNT, DPA, Phthalate Esters and Nitrosoamines in Wastewater Streams

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Phthalate esters are listed on the Toxic Pollutant List included in PL 92-500 under Part 307. Di-n-butyl phthalate (DBP), a phthalate ester, is used in the manufacture of BALL POWDER. Diphenylamine, utilized as a stabilizer in BALL POWDER, is toxic to aquatic organisms and reacts with degradation products of nitrate ester explosives to form n-nitrosodiphenlyamine. The U.S. Environmental Protection Agency has designated n-nitrosodiphenylamine a priority pollutant and is setting limits on the discharge levels permitted for these pollutants in wastewater, sludge, landfill leachate, etc. The ability to quantitatively measure the level of these pollutants is required to permit the application of the most economical treatment technology while assuring compliance with applicable discharge permit limits. The discharge of propellant production wastewater may be prohibited by the State of Wisconsin unless pollutant levels can be continuously monitored.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

SW-1: Conduct a survey of monitoring technologies.

- SW-2: Select small dedicated sensors for lab evaluations.
- SW-3: Conduct Laboratory Studies to evaluate candidate monitoring systems.
- SW-4: Write Final Report.

#### 3. Estimated schedule to perform work - tasks by months required:

Literature search Select and procure equipment Conduct laboratory studies Write Final Report

- Two months - Three months - Ten-sixteen months
- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

5. Estimated overall project life: (One- or two-year funding) The project will require two year funding.

## EXHIBIT II-H ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBA-E-83-03

Title: Scrubbing of Nitroglycerin Vapors

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

The Sweetie Barrel operation emits vapors that contain nitroglycerin (NG) and iso-propyl alcohol (IPA) in concentrations that are not environmentally accept able especially in light of the more restrictive OSHA and Clean Air Act regulations. Also as far as safety is concerned, NG condenses in low spots and IPA is static sensitive, so there is a potential for explosion. Therefore, in order to reactivate this operation in compliance with all applicable regulations, a study is needed to find out the best method to control or eliminate NG and IPA vapors from the exhaust stream.

- Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)
  - SW-1: Design and procure a bench scale scrubbing unit that will not only contr eliminate NG and IPA vapors, but also separate these from each other.
  - SW-2: Find a scrubbing medium or media that will adsorb one or the other (i.e. either NG or IPA) but not both, and evaluate the effectiveness.
  - SW-3: Evaluate methods to dispose of the separate waste streams in an environmentally acceptable manner or possibly even to reuse/recycle the collect NG or IPA.
  - SW-4: Prepare Final Report

The effectiveness of the scrubbing operation can be judged through emission measurements or material balance equations.

#### 3. Estimated schedule to perform work - tasks by months required:

Equipment Procurement - Eight months Laboratory Study - Seven months Final Report - Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 This project will require two year funding.

# EXHIBIT II-I

#### ENVIRONMENTAL PROJECTS

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TBW-E-82-11

Title: Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Nitrocellulose Area

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

The nitrocellulose area now consumes 19.7 MGD when operating at full capacity. Water consumption can be reduced by 9.8 MGD by recirculating non-contact cooling water in the nitrating area; recirculating pump water in the beater, poacher and blender operation; and making process changes in the acid neutralization procedure and the boiling tub process.

The Clean Water Act requires the application of the best available, economically achievable technology (BAT) which furthers the national goal of zero discharge.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

2. S

Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

- 1. Perform a preliminary design for reuse of non-contact cooling requirements.
- 2. Prepare preliminary design of process water system to utilize cooling water.
- 3. Prepare preliminary design of acid neutralization water reuse system.
- 4. Prepare a concept design package for a water recycle/reuse system for the nitrocellulose areas.

3. Estimated schedule to perform work - tasks by months required:

Task 1 - Three months Task 2 - Three months Task 3 - Three months Task 4 - Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

## EXHIBIT II-J ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### WI-2138-20054 GSA Inventory No.:

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

TBW-E-82-10 Project No.:

Design a Water Reuse/Recycling System to Implement Point Source Title: Engineering Study Recommendations in the BALL POWDER Area

#### Scope of Work:

(Why work is required - specific need, regulations, etc.) 1. Background:

Preliminary results from the Point Source Project indicate that the amount of wastewater can be reduced from 3.72 MGD to 0.31 MGD at full capacity when new nitrocellulose is used in the feedstock. This reduction would be recirculating propellant pumping water, recirculating propellant screening spray water, and by improved propellant washing equipment.

The Clean Water Act requires the application of the best available economically achievable technology (BAT) which furthers the national goal of zero discharge of pollutants.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

Prepare a preliminary design package for reuse of non-contact cooling water requirements.

Prepare design package for water reuse throughout area.

Prepare design package for removal of organics and sulfate from effluent water and to develop reuse/recycle characteristics.

Prepare final concept design package for water reuse/recycle in the BALL POWDER Area.

3. Estimated schedule to perform work - tasks by months required:

This is a single task project requiring twelve months.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding is required.

#### EXHIBIT II-K

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TBW-E-82-09

Title: Design a Water Reuse/Recycling System to Implement the Point Source Engineering Studies in the Single Base Manufacturing Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Preliminary results from the Point Source project indicate that approximately 120,000 GPD of process water can be recycled by utilizing a closed recirculation system for the required spray water and propellant flushing operations. One pass cooling water consumption could be reduced by approximately eight million GPD by installing on-site cooling tower systems. This is based on a 1.0 million pound/month Single Base production schedule. By reducing the quantity of wastewater discharged, those discharges that are required can be more effectively and economically treated.

The Clean Water Act requires the application of the best available economically achievable technology (BAT) which furthers the national goal of zero discharge of pollutants. The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters be eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

- 1. Prepare preliminary design for reuse/recycle of non-contact cooling water equipment.
- 2. Prepare preliminary design of process cooling water cooling system.
- 3. Prepare preliminary design of system for reclaim/recycle/reuse of water-dry system water.
- 4. Prepare concept design for implementation of water reuse/recycle system.

 Estimated schedule to perform work - tasks by months required: Engineering - Process water recycling system at six months.
 Engineering - Cooling water recycle system at six months.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how) Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

#### EXHIBIT II-L ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-12

Title: Design a Water Reuse/Recycling System to Implement Point Source Engineering Study Recommendations in the Old Acid Complex

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Approximately 10.7 MGD of wastewater is generated in the Old Acid Area, with 10.4 MGD of this wastewater stream coming from non-contact cooling water. The cooling water can be cooled and recirculated or used as adsorption water.

The Clean Water Act requires the application of the best available, economicall achievable, technology (BAT) which furthers the national goal of zero discharg of pollutants. The State of Wisconsin WPDES permit limits the level of pollutants to Primary and Secondary Drinking Water Standards.

The Federal Water Pollution Control Act Amendment of 1972 directs the country into a national goal "that the discharge of pollutants into navigable waters b eliminated." In addition, EPA Region V and the Wisconsin DNR have imposed on BAAP discharge limit guidelines for biological oxygen demand (BOD), suspended solids (SS), dissolved solids (DS), and dissolved oxygen (DO). The toxic priority pollutants list issued by the EPA could impose stringent discharge limitations

2. S

Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

1. Perform preliminary design of non-contact cooling equipment.

2. Preliminary design of cooling water cooling system.

3. Preliminary design of system to use cooling water as adsorption water.

4. Concept design package of water recycle/reuse throughout the acid area.

3. Estimated schedule to perform work - tasks by months required:

Task 1 - Three months Task 2 - Three months Task 3 - Three months Task 4 - Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year of project funding will be required.

## EXHIBIT II-M ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-82-01

Installation of Impermeable Membrane on the Ground within the Title: Acid Storage Diked Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Acid storage tank areas in the New Acid Complex are diked to contain acid spills up to and including complete tank rupture. Dike walls are constructed mostly of concrete but some are earthen. The ground within diked areas is not impermeable and therefore will not prevent migration of hazardous acid components into the groundwater.

Acid storage tank spills have contaminated the soil in diked areas and acid migration has resulted in pollution of the groundwater such that primary and secondary drinking water standards are exceeded. The State of Wisconsin requires that proper construction of the diked areas be implemented prior to mobilization to prevent future impact and/or degradation of the groundwaters of the State.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

The existing earthen diking will be replaced with concrete and the ground within the diked areas be similarly covered. The existing drain system, consisting of individual tank drain lines leading to collection sumps located below grade, would be used to drain acid spills occurring within the diked areas. Existing catch basins located under individual tank outlets would be removed and the concrete floor sloped to these drains. The ehader drain line would be valved closed except when removing a spill or rain water. The acid or rain water drained to existing sumps would be moved with existing pumps and piping to storage/neutralization tanks or to the General Purpose Sewer in the case of rain water.

There are eight acid and one caustic soda storage diked areas which require modification.

Account	Туре
758	Spent Acid Store
759	Weak Nitric Store
760	Semi Con Mix Store
671	93% Sulfuric Store
772	Oleum Store
773	mixed Acid Store

2.

Account 777 785 420-8 <u>Type</u> 93% Sulfuric Hold Store NGMA Store Caustic Soda Store

3. Estimated schedule to perform work - tasks by months required:

All work will be subcontracted. All construction work can be completed in six months with the total project completed within one year of funding.

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Subcontract work will be administered, supervised, inspected and approved by Olin facilities engineering personnel.

Estimated overall project life: (One- or two-year funding)
 One year of funding is required.

#### EXHIBIT II-N ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

#### Project No.: TBW-E-83-04

Title: Upgrade Laboratory Capability for WPDES Water Monitoring Compliance

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Wastewater from the BALL POWDER, Nitrocellulose, and other production areas is discharged to the General Purpose Sewer causing high levels of BOD. BAAP's WPDES permit allows a limited amount of BOD discharge and requires its monitoring under current discharge permit conditions.

The testing for BOD is done on a weekly basis for a 24 hour composite sample. This allows six days a week of non-monitored waste discharge.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and guality of workmanship)

The proposed study would investigate:

- SW-2: Determine whether a Respirometer  $^{(R)}$  should be used at Point Source at the several manufacturing areas or at the general discharge area.

### 3. Estimated schedule to perform work - tasks by months required:

Procurement	- Two months
Study	- Four months
Report	- Two months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 One year project funding will be required.

# EXHIBIT II-0 ENVIRONMENTAL PROJECTS

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBW-E-83-02

Develop a Combined Treatment System for the Reduction of Nitrates, Title: BOD's and COD's from the Nitrocellulose and BALL POWDER Production Areas

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Process waste from the Nitrocellulose and BALL POWDER Manufacturing Areas are discharged in the General Purpose Sewer, increasing the BOD, COD, NO<sub>3</sub>-N, and sulfate pollutants to levels exceeding the WPDES permits. This project proposes the reduction of all four pollutants by a combined treatment system. As the carbon compounds in the BALL POWDER waste stream are consumed in support of the biological denitrification of the nitrocellulose effluent, the levels of BOD and COD would also be reduced.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

- SW-1: Design and procure an anaerobic and aerobic bench scale digestion system.
- SW-2: Evaluate the anaerobic treatment of high level NO<sub>2</sub> (500-1000 ppm) wastewaters.

SW-3: Evaluate aerobic treatment of colloid and ethyl acetate.

SW-4: Write Final Report.

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

# 3. Estimated schedule to perform work - tasks by months required:

Equipment procurement Lab evaluation Final Report

- Three months
- Twelve-eighteen months
- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

Acceptance of this project will be based on review and acceptance by the technical representative on behalf of the contracting officer.

Estimated overall project life: (One- or two-year funding)
 The study will require two year funding.

#### EXHIBIT II-P

#### BADGER AAP ENVIRONMENTAL ASSESSMENT

### ENVIRONMENTAL PROJECTS

Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBH-E-82-13

Excavate and Reline Existing Nitroglycerin Pond Title:

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

This project involves cleaning out and lining the existing Nitroglycerin (NG) Pond. The permeable sediments accumulated in the bottom of the pond are contaminated with nitrates and sulfates that were present in the wastewater effluents from the NG Manufacturing Facilities during previous production periods. These contaminants percolate into the groundwater of the State of Wisconsin such that the primary and secondary drinking water standards will be exceeded. The work is required to eliminate the percolation of contaminants into the groundwater of the State and to meet the expected requirements of the Wisconsin Pollutant Discharge Elimination System permit and the Federal Clean Water Act.

# 2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

The design and development phase of this project involves detailed drainage and subsoil engineering studies and obtaining State approval for the project.

Construction work on this project involves excavating and properly disposing of contaminated soil in the bottom of the pond and lining the pond with an acid resistant reinforced polyethylene bottom liner with a foot of sand to protect it. The work also involves reshaping the sides of the pond to control surface erosion and rebuilding the pond water elevation control structure to allow more effective operation of the wastewater treatment system.

### BADGER AAP ENVIRONMENTAL ASSESSMENT

3. Estimated schedule to perform work - tasks by months required:

Project Bidding Process	2	months
Development of Final Plans	4	months
Wisconsin State Approvals	6	months
Construction Bidding	2	months
Project Construction	10	months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

The project will be inspected and administrated by Olin Corporation, Project Engineers. Assistance will be required by Olin Administration and COR Government staff to support the project during public hearings and State approvals. Final project acceptance will be by Badger AAP - COR Industrial Engineer.

5. Estimated overall project life: (One- or two-year funding) This project will require two years funding to complete. EXHIBIT II-Q

BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

Facility:

#### GSA Inventory No.: WI-2138-20054

Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agnecy Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

#### Project:

Project No.: TBA-E-82-06

Title: Install Stack Gas Monitoring/Analysis Equipment in Powerhouse No. 1

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

Powerhouse No. 1 currently burns No. 6 Residual Fuel Oil in its oilfired boilers to provide steam for the heating of active accounts throughout Badger AAP. The Clean Air Act (PL 95-95) and Wisconsin Department of Natural Resources (WDNR) Air Pollution Control Rules (NR 154/155) require that sources of air contamination maintain emissions into the ambient air below established limitations and to prevent significant deterioration of the ambient air quality. The existing boilers are not equipped with monitoring equipment with which to monitor emissions (gas flow rate, sulfur oxides, nitrogen oxides, and carbon monoxide) from each boiler and from combined streams that are discharged into the atmosphere.

2. Statement of Work to be performed: (Specific tasks to be performed and the type and quality of workmanship)

SW-1: The Subcontractor shall engineer and design an on-site flue-gas monitoring/sampling/analytical/and microprocessing system for installation in a nine-boiler complex at Badger AAP. Such engineering and design shall be in such detail that craftsman skilled in the art will be able to read, understand, and to install such equipment and supporting hardware as will be required.

SW-2: The Subcontractor will provide an on-site monitoring/sampling/ analytical/and microprocessing equipment for nine oil-fired boilers capable of monitoring and receiving flue gas emissions that will meet and/or exceed all requirements of federal and state regulations for emission monitoring and recording of data.

SW-3: The Subcontractor shall install, commission, and calibrate all of the equipment in Powerhouse No. 1 specified in SW-2 above. He shall be totally responsible for the quality, workmanship, and operational capability of all equipment supplied and for the installation of said equipment. The Subcontractor shall provide for an approved detailed list of equipment to be used in the project within 30 days of contract award. Monitoring and analytical equipment supplied shall provide instantaneous reading accurracy of 0.5% of full-scale and have a resolution capability of 0.1% of full scale.

### BADGER AAP ENVIRONMENTAL ASSESSMENT

2. SW-4: The Subcontractor shall provide a complete package of "As-Built" drawings for all elements of the project including all wiring and spool drawings as applicable.

SW-5: The Subcontractor shall provide a detailed technical report covering the engineering, procurement, construction, installation, commission, and calibration efforts of the project.

3. Estimated schedule to perform work - tasks by months required:

Preliminary engi <b>neering</b> Prepare subcontract specifications Request for Technical Proposal	- Two months - Two months - Two months
Evaluation of quotation	- One month
Award subcontract	- One month
Subcontractor mobilization Subcontractor on-site work,	- Two months
construction	- Three months
Subcontractor on-site work, commissioning	- One month
Subcontractor on-site work,	
Technical Report	- Two month
BAAP review of Technical Report	- Two months

#### ELAPSED TIME

- Eighteen months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be inspected on a daily basis by Olin's assigned Project Engineer who shall maintain a daily log of progress and make corrections and/or adjustments to the subcontract as needed as a result of field inspections.

All work shall be done in a manner and expertise as specified by the applicable Wisconsin Administrative Codes and/or ASME Code Certification.

5. Estimated overall project life: (One-or two-year funding)

Project work can be completed within two years of funding.

EXHIBIT II-R

JULY 1983 BADGER AAP ENVIRONMENTAL ASSESSMENT

#### ENVIRONMENTAL PROJECTS

#### Facility:

#### GSA Inventory No.: WI-2138-20054

#### Name: Badger Army Ammunition Plant Address: Baraboo, Wisconsin 53913 Agency Contact: Donald L. Hartmann, Industrial Engineer AV 825-3660/(608)356-5525

### Project:

#### TB-E-80-8 Project No.:

Title: Conduct a Hazardous Materials and Pesticide Management/Control Study

#### Scope of Work:

1. Background: (Why work is required - specific need, regulations, etc.)

AR 200-1 [10-6, subparagraph (7)(a)5] provides for special studies to be undertaken to define sources of pollution and develop remedial measures. During normal operations and agricultural leasings over the past forty-plus years, many potential toxic and/or hazardous chemicals and/or pesticides have been used within Badger AAP's boundaries. No accurate records exist as to type or quantities that may have found their way into the environment.

2. Statement of Work to be performed: (Specific tasks to be performed and

the type and quality of workmanship)

A systematic soil sampling and analysis study shall be conducted for all areas at Badger AAP. This study shall review all materials that may have been used in specific areas and a coordinate grid system developed for soil sampling.

- SW-1: A computer program shall be developed to collect, analyze, store, and develop environmental management reports, permit renewals, etc., as required by various state and federal regulatory agencies and to suppor the soil sampling and analysis program.
- SW-2: A systematic review of land use and possible chemicals that could have been applied during the time of occupancy by the U.S. Army shall be undertaken utilizing a grid control system to identify each area.
- SW-3: Preliminary soil and monitoring well samples shall be taken from each plant area in a systematic manner so as to reflect possible patterns fo further studies if potential problems are determined. Soil samples shall be taken and preserved in an approved manner so as to maintain their integrity throughout the analysis/evaluation program.

- 2. SW-4: All samples shall be analyzed for those items specified in the EPA's EP Toxicity List and for those materials suspected to be present as a result of prior plant operations. Significant results shall trigger an in-depth soil survey of the affected area to pinpoint the source of the pollution.
  - SW-5: All data generated by the soils sampling survey and laboratory analyses shall be compiled by the computer and an in-depth report issued.
- 3. Estimated schedule to perform work tasks by months required:

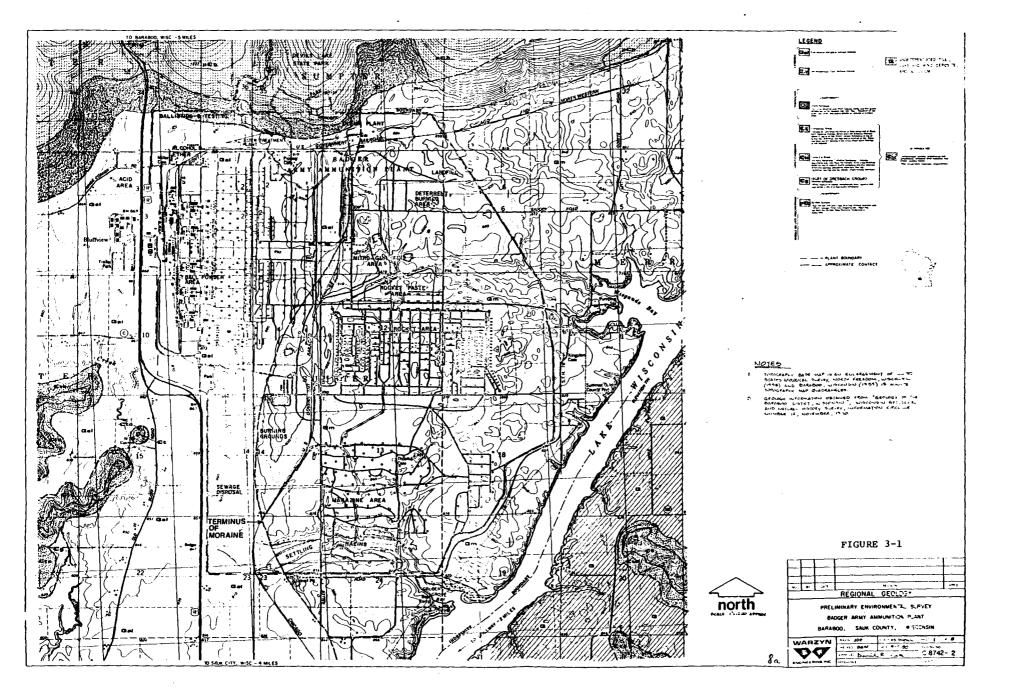
Computer program	- Six months
Soil sampling grid	- Three months
Soil sampling	- Eighteen months
Soils Analysis	- Eighteen months
Evaluation of data	- Three months
Final Report	- Three months

4. Inspection/Acceptance Criteria for work completion: (Who, what, and how)

All work shall be accomplished under the direction of Olin's assigned Project Engineer who shall evaluate progress and data developed and modify the ongoing program in accordance with the results of the study developed at that point.

5. Estimated overall project life: (One- or two-year funding)

Project work can be completed within two years of funding.



outcrops in the vicinity is the late Precambrian Baraboo Quartzite. The Baraboo Syncline, which borders BAAP to the north is composed almost entirely of quartzite. Precambrian granites underlie the site area and are somewhat older than the Baraboo Quartzite. Granitic rocks are not exposed at the surface but were encountered in plant wells.

The upper Cambrian Dresbach Group (including the Mt. Simon, Eau Claire, and Galesville Formations), Tunnel City Group, Trempeleau Group, and the Ordovician Oneota Formation were deposited unconformably on the flanks of the Baraboo Syncline. The Mt. Simon and Eau Claire sandstones are not exposed at the surface in the area but were encountered at depth beneath the plant at several of the plant wells. Based on the plant production well logs, the combined thickness of the Eau Claire and Mt. Simon sandstones ranges between 105 and 321 feet.

The Galesville Formation, Tunnel City Group, Trempeleau Group and Oneota formations are exposed at the surface as erosional remnants to the east, south and west of BAAP and form the characteristic highlands of the area south of the Baraboo Hills. These formations have not been encountered in deep borings within the confines of the BAAP.

Undifferentiated Cambrian Quartzite Conglomerate was deposited along the flanks of the Baraboo Hills and has a limited areal extent. The conglomerate outcrops along the northern edge of BAAP near the water reservoirs.

#### Hydrogeology

There are two major aquifers underlying BAAP. The upper sand and gravel (outwash) aquifer exhibits water table conditions throughout the area. In areas where the outwash aquifer is thick, well yields over 1,000 gallons per minute can be obtained. Plant Well No. 4, the only plant well finished in the outwash aquifer, has been pump tested at well over 1,000 gallons per minute with little associated drawdown. The underlying sandstone aquifer is under water table conditions and hydraulically connected to the upper sand and gravel aquifer over the majority of the site area, except where overlain by relatively impermeable glacial till or where shaley members are present in the bedrock. In these areas, the sandstone aquifer may be influenced by semi-confined conditions. All plant wells (except Well No. 4) fully penetrate the sandstone aquifer. Well capacities of production wells at BAAP range between 700 and 1,500 gallons per minute. The underlying Precambrian granites and quartzites are relatively impermeable and do not constitute an aquifer in this area. Due to the low permeability of these rocks, they mark the lower limit of groundwater movement.

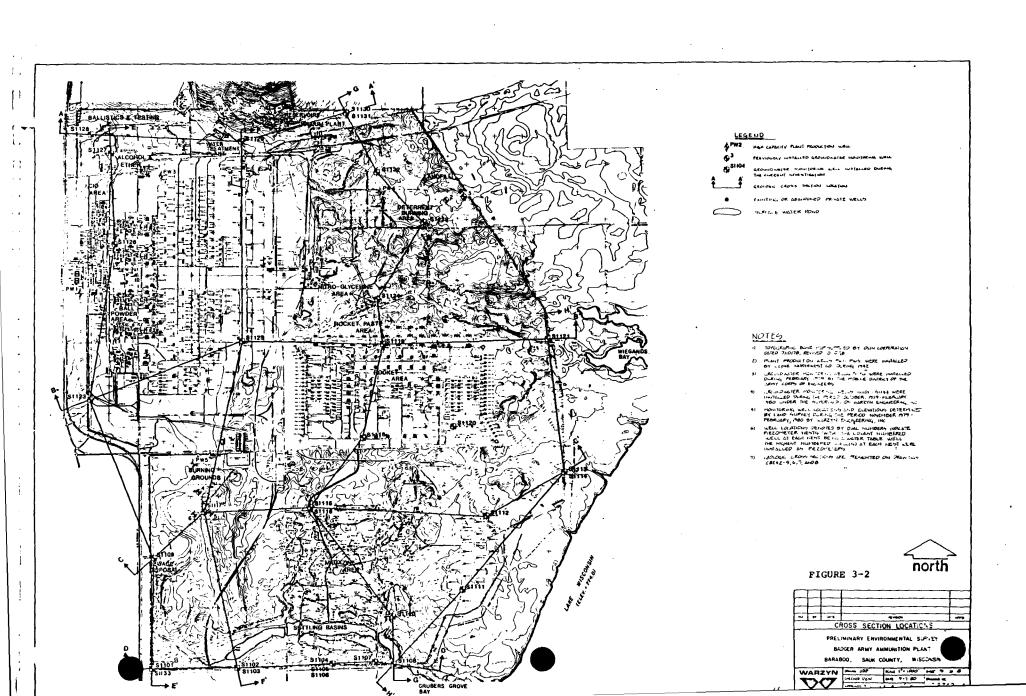
Recharge to the water table aquifer is from infiltration due to precipitation over most of the plant area, except near Lake Wisconsin. Before Lake Wisconsin was dammed at Prairie du Sac (approximately 2 miles south of Badger), shallow groundwater from the upper water table system discharged into the then existing Wisconsin River along its entire length. Based on an 1885 edition of the USGS 15 minute topographic series map of the Baraboo Quadrangle, the elevation of the former Wisconsin River in the vicinity of BAAP was approximately 745, USGS datum. The present spillway elevation at the dam (and the elevation of Lake Wisconsin) is maintained at 774.0 USGS datum. Elevated lake levels have caused a reversal in groundwater flow directions adjacent to the Lake, with the Lake acting as a recharge zone for the adjacent water table aquifer. The reversal of groundwater flow directions has caused a linear depression (reversal) in the water table surface along the southeastern edge of BAAP forcing groundwater flow in this area to the south. Groundwater discharges directly into the Wisconsin River below the dam at Prairie du Sac.

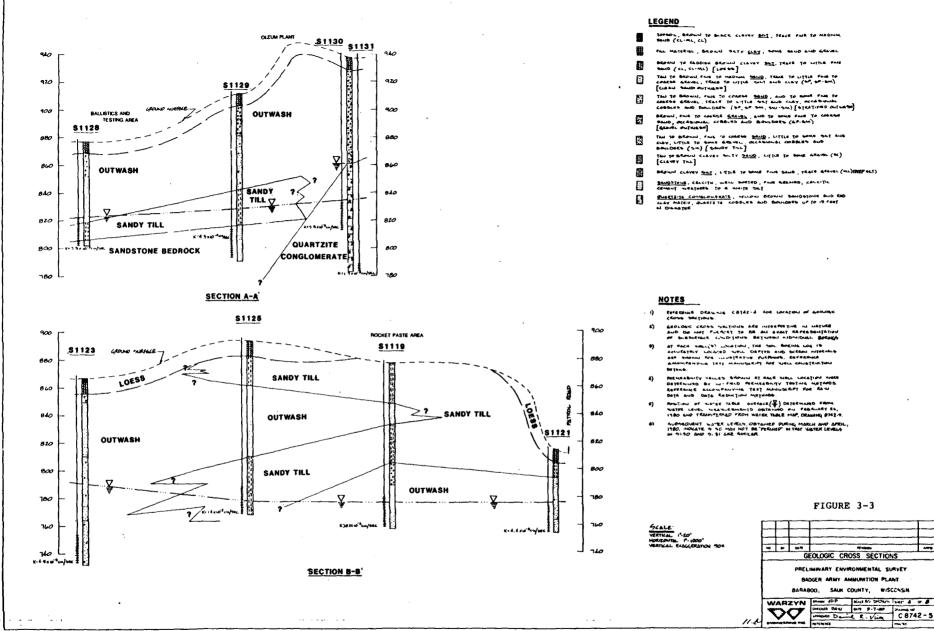
#### SUBSOILS

### Introduction

The subsoils at BAAP consist of unconsolidated, glacially derived sediments which were deposited as a result of late Pleistocene, Wisconsin Stage Glaciation. Unconsolidated sediments exhibit a thickness of at least 260 feet, as indicated by the well log for plant production well No. 2. The sediments consist mainly of clean outwash sands and stratified outwash sand and gravel with lesser amounts of interbedded glacial till. Wind-blown deposits (loess) blanket the majority of the area.

A detailed description of the various soil strata is presented in the following sections. Geologic cross-section locations are shown on Figure 3-2. Geologic cross-sections based on soil borings performed during the present investigation are presented in Figures 3-3 through 3-6. The results of the in-field permeability testing program are also included on the cross-sections. The field data for the permeability tests is contained in Appendix G including an explanation of methods used to reduce the field data. Soil gradation curves of representative samples of the various subsoil units are also presented in Appendix G.

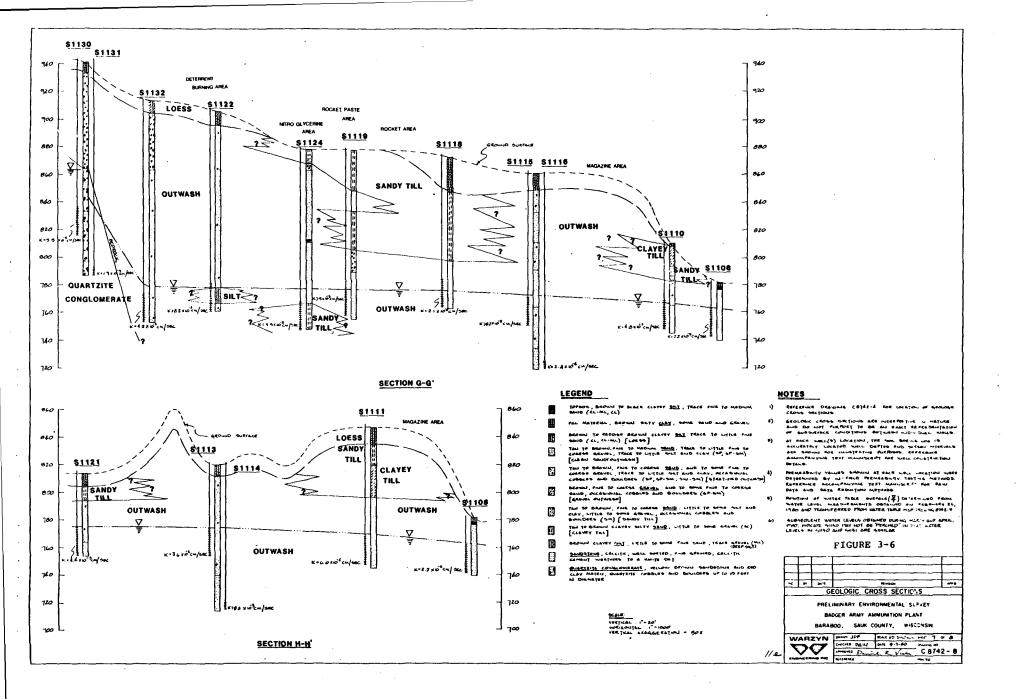


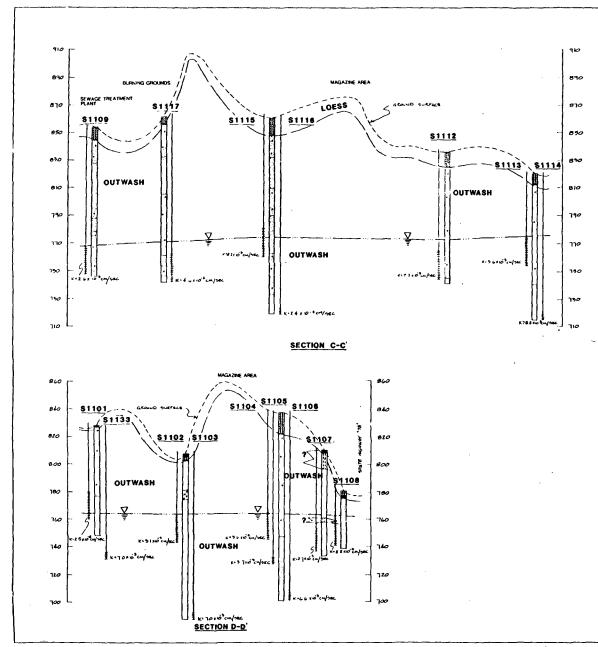


GEOLOGIC CROSS SECTIONS PRELIMINARY ENVIRONMENTAL SURVEY BADGER ARMY AMMUNITION PLANT

----

.





#### LEGEND

TOPOOL, BROWN TO BLACK C-AVER SILT, TRACE FINE TO MEDIUM SAND (CL-ML, CL) ٥

MATERIAL , BROWN SETT CLAY , SOME MAND AND GRAVEL

TO GODION BROWN CLAUST SET, FRACE TO WITLE FAR P • ( cu, cu · mu) [ 106 + ]

- [CLEAN DENDY OUTWEEN] The to be derive. There to use in the to state to use to the to
- Ø
- BROWN, FUILS TO COREOS STALLS, AND TO SAME FUILS TO COREOS SAND, OCCASSIONEL COBBLES AND BOULDERS (6P. SM) [GRAVEL SUTWARM]
- THE TO BROWN, FOR TO COMEND SAUD LITLE TO SALE SET AND COMPLETE TO SAME SEE OCCAS ONLY COBBLES AND BOULDERS (SM) [ SANDY TILE] ۵
- THAT TO BEAULY CLEVEN WILTY TAND, LITTLE TO THUS GRANEL (SC) [CLEVEN THL] Ø
- BROWN CLEVEN ONLY , LITLE "F YOME FINE SAME , TRACE GRAVEL (ML) (DEEP SET) Ø
- SAUDSTONE, CALCITIC, WELL SOCTED, FINE GRANIED, CALCITIC CEMENT WEATHERS TO A WIN TO SET Π

#### NOTES

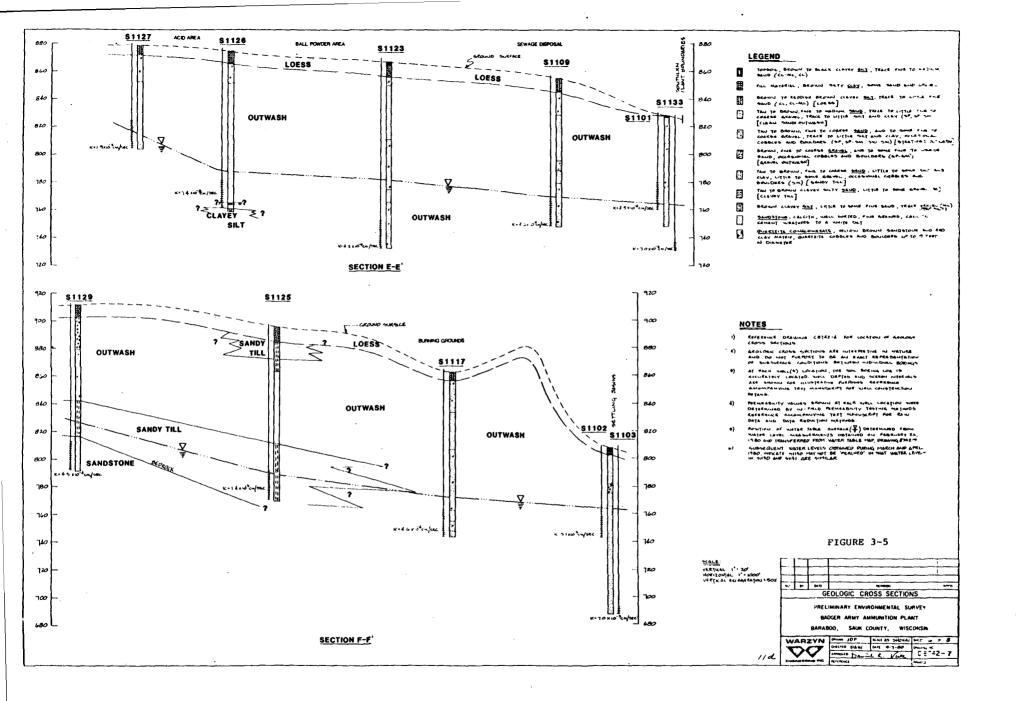
6)

REFERENCE DRAWNIA CETTER FOR LOCATION OF GROUNK •) LODS SECTIONS

- GEOLOGIC CROSS SECTIONS ARE INTERPRETINE IN NATURE AND DO NOT PURPORT TO BE AN REACT REPRESENTATION OF GUBSURFACE CONDITIONS BETWEEN ADDIVIDUAL BORINGS #)
- AT PACH WALL(B) LIVET D., THE THE BOUNDARY DURING AS AND TO COMPACT D. THE THE BOUNDARY AND THE PACE OF THE PACE AND SECTION AND THE PACE OF THE PACE AND THE PACE OF THE PACE AND THE PACE OF THE PAC •)
- الحطيقمة بالا بعديدة عسمين ما معرة بيعد تحديثان سدوه Detation by in- the Prevability toming mathods. Certence accompanies for Manuscrift for Raw Data and Data Cebutton methods. 4)
- Position of water take turning of the form of the transformed from water (site takes) of the takes of takes of the takes of ta **a**)
  - MUBYEGLENT WATER LEVELY JOTAINED DURNIG MARCH AND APRIL, 1980, INDIXATE 3:35 47 NOT BE "PREVIED" IN THAT WATER LEVELY IN 191190 ACT 31151 ARE SHITLAR

#### FIGURE 3-4

<u>YALE</u> VERTICAL (\* 20' HORIZONITEL (\* 1000 VIRTAL EKIGGGERATION + 5- 1 ------GEOLOGIC CROSS SECTIONS PRELIMINARY ENVIRONMENTAL SURVEY BADGER ARMY AMMUNITION PLANT BARABOO, SAUK COUNTY, WISCONSIN WARZYN MIN JOP KALLAS SHOLL ME S # 8 LACTED FAW ONTH 8-7.80 SIMO DO  $\nabla \nabla$ 1.2 -----



#### Physical Properties

Loesial Deposits - Loess deposits blanket the majority of the site, reaching a maximum thickness of 22 feet at S1118. Texturally, the loess is a brown to reddish brown clayey silt, some fine sand, trace to little fine gravel (CL, CL-ML). The results of three soil gradations and other physical tests of the material are presented in Table 3-1.

At several of the boring locations, the silty deposits graded into the underlying sandy soils though at most locations there was a distinct change between the loess and underlying sand. Sample D0077 obtained at S1126 is representative of the gradational material. The average soil gradation is 5 percent gravel, 26 percent sand, 46 percent silt, and 23 percent clay with a liquid limit of 33 and plasticity index of 15.

As previously mentioned, the loesial deposits blanket the site, except in the vicinity of the rocket paste area. At Wells Slll9 and Sll24, the upper loess is absent and appears to have been excavated during plant construction activities.

A thin veneer of topsoil has developed on the loess, as noted during several of the borings. The topsoil is generally a black to brown clayey silt with a trace of fine to medium sand. The topsoil is similar in texture to the underlying loess but is organically enriched. It should be noted that the loesial silts were not encountered at Well Sll08. Well Sll08 is located along a plant access road at the southern end of the settling basin. This area appears to have been built up with earth fill to facilitate road construction.

<u>Outwash Deposits</u> - Glacial outwash material is the predominant unconsolidated deposit underlying BAAP. The outwash ranges from a clean sand to stratified sand and gravel to sandy gravel. Clean sand and stratified sand and gravel were differentiated on the boring logs based on the presence of gravel and cobbles zones within clean outwash sands and further differentiated on the basis of laboratory grain size analysis.

<u>Clean Outwash Sands</u> - The clean outwash sands consist of fine to medium sand, trace to little fine to coarse gravel, trace to little silt and clay (SP, SP-SM). At Borings S1123 and S1124, the clean sand appeared to be laminated with thin seams of silty sand. The soil testing results of representative samples of the clean outwash sands are presented in Table 3-2. The soil gradations generally ranged from 0 to 10 percent gravel, 75 to 98 percent sand, and 2 to 9 percent silt and clay (P200 material). The average soil gradation was 3 percent gravel, 92 percent sand, and 5 percent silt and clay.

Well	Sample Number	Depth (feet)	Percent Gravel	Percent Sand	Percent Silt	Percent Clay	L.L.	<u>P.I.</u>	USCS
S1109	D0021	5	0	18	58	24	33.3	11.6	CL
S1126	D0077	8.5	8	48	31	13	22.7	9.6	SC
S1129	D0088	5	<u>6</u>	12	<u>48</u>	34	42.8	24.0	CL
Averag	e Gradati	on	5	26	46	23	32.9	15.1	

TABLE 3-1 LOESS DEPOSITS

18

.

## TABLE 3-2

### CLEAN OUTWASH SAND

<u>Well</u>	Sample Number	Depth	Percent Gravel(a)	Percent Sand (a)	Percent P200(a)	USCS
S1101	D0003	80	1	94	5	SP-SM
S1103	D0004	15	4	90	6	SP-SM
S1103	D0006	50	0	96	4	SP
S1103	D0009	101	1	95	4	SP
S1106	D0014	91	0	97	3 2	SP
S1106	D0015	116	2	96	2	SP
S1107	D0016	27	0	95	5	SP-SM
S1107	D0017	55	0	96	4	SP
S1107	D0018	77	0	96	4	SP
S1108	D0020	42	0	97	3	SP
S1109	D0022	28	0	94	6	SP-SM
S1110	D0026	49	10	85	5	SP-SM
S1110	D0027	66	0	93	7	SP-SM
S1111	D0030	67	1	92	7	SP-SM
S1111	D0031	101	0	96	4	SP
S1112	D0034	95	0	97	3	SP
S1114	D0037	106	0	97	3	SP
S1116	D0039	95	5	91	4	SP
S1117	D0044	121	0	98	2 2	SP
S1118	D0047	90	3	95	2	SP
S1119	D0050	29	0	94	6	SP-SM
S1119	D0051	103	13	84	3	SP
S1121 (b)	D0058	60	0	91	9	SP-SM
21122	D0063	29	10	75	15	SM
S1123	D0065	99	1	94	5	SP-SM
S1124 (b)	D0069	70	3	91	6	SP-SM
S1124 <sup>(D)</sup>	D0070	100	7	70	23	SM
S1125	D0073	32	4	94	2	SP
S1126	D0079	48	6	92	2	SP
S1127	D0081	28	0	98	2	SP
S1127	D0082	48	19	77	4	SP
S1127	D0083	66	0	96	4	′ SP
S1128	D0086	56	0	97	3	SP
Average	Gradatio	n:	3	92	5	
	_					

NOTES:

 (a) Percentages of gravel, sand and P200 presented in this table were obtained from the soil gradation curves, Appendix G.

(b) Represents a clean outwash sand with minor silt laminations.

Stratified Outwash - Texturally, the stratified outwash deposits can be described as tan to brown, fine to coarse sand interbedded with fine to coarse gravel, some sand, little silt and clay, occasional cobbles and boulders (SP, SP-SM, SW-SM). Coarse gravel and cobble zones ranging in thickness between 1 and 5 feet were commonly encountered in the stratified For the purposes of this report, coarse outwash deposits. gravel and cobble zones have been differentiated from boulders based on the action of the drill rig while advancing the bore In areas of coarse gravel and cobbles, the drill rig hole. would typically "chatter" whereas when a boulder was encountered, the rig would act as though drilling through consolidated rock. At several well locations, substantial water losses occurred in coarse gravel zones in stratified outwash material. Reference boring logs, Appendix G for depths and locations of water losses.

The results of laboratory testing of samples of stratified outwash deposits are presented in Table 3-3. Soil gradations on tested samples resulted in 11 to 47 percent gravel, 48 to 81 percent sand and 1 to 10 percent silt and clay with an average gradation of 23 percent gravel, 70 percent sand, and 7 percent silt and clay. In thinly stratified soils, the gradation will be representative of the interval over which the split spoon sample was obtained and will not be representative of the individual laminae.

<u>Gravel Outwash</u> - Sandy gravel outwash was encountered at S1119, S1128, S1129 and S1130. The gravelly outwash probably represents areas where stratified outwash has been reworked by active glacial melt waters which effectively removed a significant portion of the sand fraction. Gravel outwash can be texturally described as a brown, fine to coarse gravel and some fine to coarse sand, little silt and clay (GP-GM). Soil gradation analyses were performed on three representative samples of the gravel outwash and are presented in Table 3-4. The average grain size is 53 percent gravel, 39 percent sand, and 8 percent silt and clay.

#### TABLE 3-4

#### GRAVEL OUTWASH

<u>Well</u>	Sample <u>Number</u>	Depth	Percent <u>Gravel</u>	Percent Sand	Percent P200	USCS
S1129 S1131 S1132	D0089 D0092 D0094	28 47 48	53 51 55	38 41 <u>39</u>	9 8 6	GP-GM GP-GM GP-GM
۸	verage Gi	rain Size	e 53	39	8	

## TABLE 3-3

# STRATIFIED OUTWASH

Wo 1 1	Sample	Donth	Percent	Percent Sand	Percent	HCOC
Well	Number	Depth	Gravel		P200	USCS
S1101	D0001	23	44	48	8	SP-SM
S1101	D0002	49	23	70	7	SP-SM
S]106	D0012	42	14	81	5	SP-SM
S1106	D0013	51	23	72	5	SP-SM
Sll09 <sup>(a)</sup>	D0023	87	5	92	3	SP
S1110	D0025	28	12	82	6	SP-SM
S1112	D0033	52	17	70	13	SM
S1114	D0035	21	19	73	8	SP-SM
S1114	D0036	71	47	49	4	SP
S1116	D0040	116	40	54	6	SP-SM
S1117	D0042	28	20	76	4	SP
s1117	D0042	69	40	54	6	SP-SM
S1120	D0054	69	22	68	10	SP-SM
S1120	D0055	124	36	58	6	SP-SM
S1121 (2)	D0056	28	14	79	7	SP-SM
S1121 <sup>(a)</sup>	D0057	48	6	88	6	SP-SM
S1122	D0060	34	11	79	10	SP-SM
S1122	D0061	89	22	71	7	SP-SM
S1123	D0064	69	44	49	7	SW-SM
S1126,	D0078	9	20	72	8	SP-SM
S1132 <sup>(a)</sup>	D0095	128	0	89	11	SP-SM
S1132	D0096	149	24	75	1	SP
Average	Gradatio	n:	23	70	7	

NOTES:

(a) Represents sample taken in clean sand between sand and gravel layers.

Baildown Test Results for Outwash Deposits - The results of the baildown permeability testing of wells screened in outwash deposits are presented in Table 3-5. As noted in Table 3-5, the rate of recovery to static water level in several wells was too rapid to accurately measure. Generally speaking, the wells would recover from a drawdown of 15 to 25 feet in less than 2 minutes. Due to the air pumping methodology utilized in baildown tests, accurate pumping rates could not be determined. The maximum recordable permeability of wells screened in outwash material approached  $8.3 \times 10^{-3}$  centimeters per second (cm/sec). Measured permeabilities range between  $8.2 \times 10^{-3}$  cm/sec to  $4.5 \times 10^{-5}$  cm/sec, with an average permeability of  $3.5 \times 10^{-3}$  cm/sec.

No attempt has been made to differentiate between wells screened in different types of outwash. The major controlling factor on permeability is the percent of silt and clay (matrix) not the amount of sand versus gravel. Since the soil gradations for the various types of outwash indicate similar P200 (silt and clay) contents, it is assumed permeabilities are similar between the various outwash deposits. It is expected that the permeability in coarse layers is greater than the permeability in finer layers of stratified deposits.

<u>Glacial Till</u> - Two categories of glacial till were encountered during the subsurface exploration programs: 1) sandy till and 2) clayey till. The sandy till is a tan to brown, fine to coarse sand, little to some silt and clay, little to some gravel, occasional cobbles and boulders (SM). The clayey till can be described as a tan to brown clayey silty sand, little to some gravel (SC). The results of the soil testing of samples of glacial till indicate an average gradation of the sandy till of 14 percent gravel, 68 percent sand, and 18 percent P200 material (Table 3-6). A sample of clayey till from Sllll indicates a soil gradation of 10 percent gravel, 45 percent sand, and 45 percent P200 material with a liquid limit of 25.9 and a plasticity index of 9.0. The high plasticity index indicates a significant portion of the P200 fraction is clay.

Three wells at BAAP are screened in sandy till material; Sll24, Sll25 and Sll28. Measured permeabilities were  $3.5 \times 10^{-5}$  cm/sec,  $1.4 \times 10^{-2}$  cm/sec and  $7.3 \times 10^{-4}$  cm/sec at Sll24, Sll25 and Sll28, respectively. Wells Sll24 and Sll28 appear to display typical permeabilities for sandy till. The reason for the high permeability at Sll25 is not clear at this time. There were no wells screened in the clayey till. The estimated permeability of the clayey till is  $10^{-5}$  to  $10^{-7}$  cm/sec.

Deep Silt - At S1122 and S1126, a silt layer was encountered at 127 and 109 feet, respectively. In comparison to the other soil groups encountered at the site, the deep silt is a minor

#### TABLE 3-5

	Coefficient of			Coefficient of	
Well	Permeability	Geologic	Well	Permeability	Geologic
Number	(cm/sec)	Unit	Number	(cm/sec)	<u>     Unit    </u>
S1101	$2.5 \times 10^{-4}$	Outwash	S1121	$4.4 \times 10^{-3}$	Outwash
S1102	$3.1 \times 10^{-3}$	Outwash	S1122	(a,b)	Outwash &
<b>s1</b> 103	7.0 x 10 <sup>-3</sup>	Outwash			Silt
<b>S1104</b>	3.6 x 10 <sup>-3</sup>	Outwash	S1123	4.2 x 10 <sup>-5</sup>	Outwash
S1105	$3.7 \times 10^{-3}$	Outwash	S1124	3.5 x 10 <sup>-5</sup>	Sandy Till
			S1125	$1.4 \times 10^{-2}$	Sandy Till
S1106	6.6 x 10 <sup>-3</sup>	Outwash			
S1107	2.7 x 10 <sup>-3</sup>	Outwash	S1126	7.4 x 10 <sup>-3</sup>	Outwash
S1108	$2.2 \times 10^{-3}$	Outwash	S1127	1.9 x 10 <sup>-3</sup>	Outwash
S1109	2.6 x $10^{-3}$	Outwash	S1128	$7.3 \times 10^{-4}$	Sandy Till
S1110	$4.8 \times 10^{-3}$	Outwash	S1129	$4.3 \times 10^{-4}$	Sandstone
			S1130	5.5 x $10^{-5}$	Quartzite
S1111	7.0 x 10 <sup>-4</sup>	Outwash			Conglomerate
S1112	8.2 x $10^{-3}$	Outwash			
S1113	3.6 x 10 <sup>-3</sup>	Outwash	S1131	1.9 x 10 <sup>-5</sup>	Quartzite
S1114	(a)	Outwash			Conglomerate
S1115	(a)	Outwash	S1132	4.2 x 10 <sup>-3</sup>	Outwash
			S1133	7.0 x 10 <sup>-3</sup>	Outwash
S1116	2.4 x $10^{-4}$	Outwash			
S1117	$4.6 \times 10^{-4}$	Outwash			
S1118	$2.1 \times 10^{-3}$	Outwash			
S1119	(a)	Outwash			
S1120	(a)	Outwash			

### SUMMARY OF BAILDOWN PERMEABILITY TESTS

NOTES:

(a) Recovery of water too rapid to measure; permeability greater than 8.2 x  $10^{-3}$  cm/sec.

(b)
Well partially screened in outwash, partially screened in
 deep silt.

### TABLE 3-6

Sandy Til	.1	,				·		
Well Number	Sample Number	Depth	Percent Gravel	Percent _Sand	Percent P200	LL	PI	USCS
S1111	D0028	27	8	79	13		,	SM
S1118	D0046	30	11	73	16			SM
Slll9 <sup>(a)</sup>	D0049	28	0	42	58	17.7	2.2	ML
S1120	D0053	29	1	84	15			SM
S1124	D0071	130	34	53	13			SM
S1125	D0076	126	16	51	33			SM
Average G	Gradation		14	68	18			
<u>Clayey Ti</u>	.11							
S1111	D0029	27	10	45	45	25.9	9.0	SC

SANDY AND CLAYEY TILLS

NOTES: (a) Represents thin clayey silt layer in sandy till (not included in average gradation).

. .

unit. Two samples from S1122 and S1126 of the deep silt exhibited soil gradations of 0 and 3 percent gravel, 3 and 16 percent sand, 75 and 81 percent silt, and 6 and 16 percent clay. A sample from S1122 exhibited a liquid limit of 21.9 and a plasticity index of 2.5. The USCS classification is ML.

#### Summary - Subsoils

Collectively, the various outwash deposits are the dominant soil type at the BAAP. As evident from the geologic cross-sections, the entire western boundary and the majority of the southern boundary are underlain by outwash materials. The central areas of the plant in the vicinity of the rocket paste area, rocket area, and nitroglycerin area are underlain by interbedded outwash and till (see Cross-sections B-B' and G-G'). The southeast portion of the magazine area (see Cross-sections G-G' and H-H') is also underlain by interbedded till and outwash. The till deposits were encountered at the surface (or directly below the surficial loess) at S1110, S1111, S1107, S1119, S1121 and S1125. At the other wells in these areas, tills were interbedded between glacial outwash deposits.

The interbedded nature of the till and outwash deposits are the result of an undulating ice front. Glacial outwash deposits were laid down in front of the glacial terminus. As the ice advanced over BAAP, glacial till (morainal deposits) were deposited over outwash material. As the ice retreated, outwash sand and gravel generally blanketed the morainal deposits.

There is no indication from the soils encountered in this investigation of the presence of a buried bedrock valley beneath the eastern boundary of BAAP. An expanded soil boring program (deeper borings) would be necessary to confirm or deny the existence of a buried bedrock valley.

#### BEDROCK DEPOSITS

Two bedrock units were encountered during the subsurface exploration program: sandstone and quartzite conglomerate. Sandstone was encountered along the northern site boundary at S1128 and S1129 at Elevations 805 and 820, respectively. Based on wash samples obtained during the drilling operation, the sandstone is a calcitic, well sorted, fine grained sandstone. Calcite cement appears to weather to a white silt-like material. Based on the bedrock logged on the plant production well logs, the sandstone is part of the Upper Cambrian Dresbach Group, either the Mount Simon or Eau Claire Members. There were no significant water losses while drilling through the sandstone which indicates the sandstone at these locations is relatively unfractured. The permeability testing result at S1129 was 4.3 x  $10^{-4}$  cm/sec. The well screen is located entirely within the sandstone unit.

Undifferentiated Cambrian quartzite conglomerate was encountered at S1130. The quartzite particles range in size from pebble size to boulders over 15 feet in diameter. The matrix of the conglomerate is primarily sandstone, though a red clay matrix (possibly weathered shaley members) was encountered.

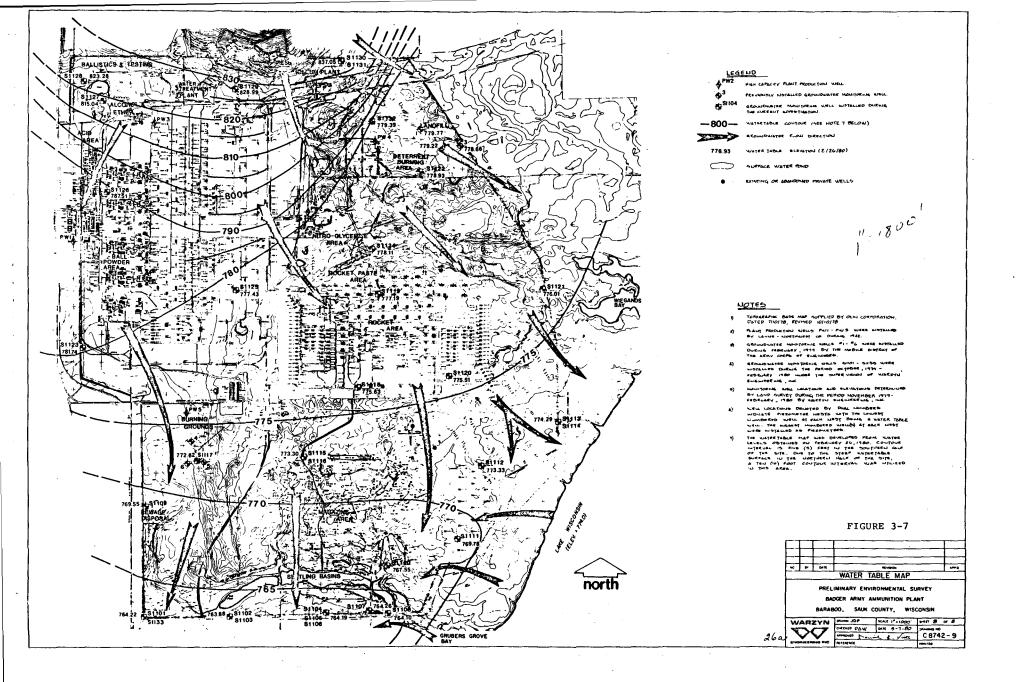
The upper surface of the conglomerate is sufficiently weathered such that a split spoon sample was obtained. The sample consisted of 52 percent gravel (mostly quartzite), 25 percent sand, and 23 percent silt and clay. The permeability of the conglomerate as measured at S1130 and S1131 is  $5.5 \times 10^{-5}$  cm/sec and  $1.9 \times 10^{-5}$  cm/sec, respectively. We would expect the permeability to decrease with depth.

#### GROUNDWATER FLOW

A groundwater contour map indicating the configuration of the water table surface and groundwater flow directions is shown on Figure 3-7. The contours are based on groundwater elevation measurements obtained on February 26, 1980 (Table 3-7). At piezometer nests, the water table elevation is based on the shallowest monitoring well within the nest, except at S1130 which appears to monitor perched water table conditions. Well S1131 was used at this location.

The direction of groundwater movement within the plant area dictates the potential migration direction of contaminants within the groundwater flow system. As the water table map indicates, groundwater flow across the site is primarily in a southerly direction. In the southern half of the site, the water table elevations range from approximately 781 at S1123 to approximately 764 along the southern plant boundary. The depth of water ranges between approximately 20 feet at S1108 to over 105 feet at S1120. The horizontal hydraulic gradient of water table surface beneath the burning grounds, magazine area, and settling basins is approximately 0.002 feet per feet to the south.

The influence of Lake Wisconsin is evident in the southeastern corner of this site. Groundwater flow is from the lake (Elevation 774.0) towards Wells Slll2, Sllll and Sll08 located in the east and southeast portion of the magazine area. The component of flow from the lake then becomes southerly in the vicinity of Sll07, Sll04 and Slll0. As discussed in the



#### TABLE 3-7 SUMMARY OF MONITORING WELL DATA

.

` ( )

į.

Well	Date	Depth (cm below ground	Screen Leugth	<b>Ground</b> Surface Elevation (cm.above	19	80 Water Eleva	tiona (cm_a)⊬ve	scalevel)	
Number	Installed	surface)	(cm)	sea level)	January 11	February 19	February 26	Murch 6	Aj. 11 11
\$1101	12/14/79	2072.6	609.6	25244.7	23307.8	23294.6	23293.4	23295.3	23294.9
\$1102	11/5/79	1969.0	609.6	24615.0	23279.7	23283.4	23283.1	23282.1	23255.2
S1103	11/2/79	36.60.9	153.9	24616.6	23283.4	23285.8	23285.5	23284.6	232.1.3
S1104	11/7/79	2850.5	606.3	25527.3	23297.4	23290.1	23292.5	23289.5	23298.9
\$1105	11/15/79	3337.6	154.5	25522.7	23294.3	23289.5	23291.6	23288.9	23293.9
<b>S11</b> 06	11/14/79	4136.7	151.2	15540.4	23224.6	232389.3	25292.8	23259.5	23. 1. 1
S1107	1/10/80	2216.3	621.5	24690.6		23291.7	23294.6	23292.2	233 1.3
S1108	12/28/79	1196.3	622.1	23816.2	23288.2	23238.2	23269.8	23286.4	23232.5
\$1109	2/14/80	3271.7	621.2	26050.6		23455.9	23455.9	23456.2	23455.0
\$1110	1/15/80	1889.8	616.9	24703.4		23391.0	23394.9	23390.6	233 5.0
<b>S</b> 1111	1/2180	3013.5	616.9	25801.0	23448.6	23455.9	23462.9	23457.4	234 .8
S1112	1/4/80	2795.0	617.5	25488.3	23558.6	23559.5	23571.1	23559.5	235-3.5
<b>S1113</b>	11/23/79	2015.6	616.6	24991.2	23599.4	23600.1	23600.4	23599.7	23353.7
S1114	11/20/79	3211.1	153.0	24986.0	23599.4	23600.7	23600.7	23599.7	23601.9
s'1115	12/14/79	3352.8	621.5	26263.7	23554.6	23594.9	23570.2	23562.9	235-4.3
S1116	12/13/79	4309.8	159.1	26225.3	23554.3	2352913	23563.2	23563	235-11
S1117	2/13/80	3629.3	616.3	26292.4		23546.4	23549.4	23547.3	23147.9
S1118	11/30/79	3304.0	616.6	26604.2	23630.3	23636.9	23641.2	23636.9	23639.1
S1119	1/22/80	3647.2	611.7	26751.4		23683.3	23688.8	23684.4	23624.8
S1120	1/17/80	3743.2	615.0	26732.8		23633.3	23637.5	23633.6	23634.2
S1121	1/18/80	1807.5	615.4	24808.6		23652.2	23652.8	23650.9	23651.8
S1122	1/25/80	4389.1	615.0	27580.4		23736.9	23741.8 W	23694.2	23736.9
S1123	12/28/79	4094.1	622.4	26427.1	23824.1	23827.7	23827.4	23828.6	238.5.9
51124	12/19/79	3924.9	614.5	26761.7	23722.6	23768.9	23716.8	23713.7	23-14.0
S1125	12/27/79	3849.6	<b>016.3</b>	27275.6	23751.5	23694.2	23696.0	23753.0	2.16 5.0
<b>S</b> 1126	2/11/80	3461.0	605.3	26660.9		24002.1	24003.3	24000.6	23000.3
S1127	2/8/80	2281.1	617.2	26770.9		24842.1	24842.4	24833.9	24832.4
S1128	12/19/79	2268.6	621.5	26736.8	25127.1	25093.3	25093.6	25081.7	25073.5
S1129	2/7/80	3595.4	609.9	27765.8		25272.2	25207.6	25253.6	25216.7
S1130	12/17/79	3792.9	617.2	28625.9	26269.8	26235.1	26233.2	25436.2	25507.2
S1131	12/6/79	4678.4	158.4	29678.6	25527.6	25520.6	25513.3	25515.7	25305.0
S1132	2/4/80	4804.9	618.4	27818.2		23749.1	23755.8	23747.9	23750.3
S1133	2/19/80	2956.6	157.3	25239.3		23274.8	23292.8	23293.4	232:3.1
S1133 (a) S1134 (a)					23752.1		23750.6	23755.2	237.50.0
					23737.2		23739.7	23736.9	23734.7
S1135 (a) S1136					23751.8		23767.4	23765.9	23761.0

NOTES: (a) Wells S1134, S1135 and S1136 were not drilled as part of this study.

13

regional groundwater section of this chapter, the damming of the Wisconsin River to form Lake Wisconsin has caused a reversal in groundwater flow directions near the lake. The trough in the water table surface in the southeastern plant area is the result of recharge from Lake Wisconsin meeting the regional flow towards the lake.

Based on the surface water elevation at Gruber's Grove Bay (Elevation 774.0) and the water table elevation at S1108 (Elevation 764.10), located at the end of the bay, it appears the back bay portion of Gruber's Grove Bay is perched. Previous deposition of sediment from plant waste disposal activities has effectively sealed the bottom of the bay, creating a perched condition. Towards the mouth of the bay, the water table surface probably resumes its regional attitude.

In the vicinity of the nitroglycerin area, rocket paste area, rocket area, and deterrent burning area, the water table surface is quite flat with an associated horizontal hydraulic gradient of 0.001 feet per feet. Groundwater flow along the eastern plant boundary between Well Sll13 and landfill wells Nos. 1 through 3 is leaving the plant boundaries to the east. In this area, flow is towards Lake Wisconsin. The area in the vicinity of Wells Sll12, Sll13 and Sll14 is where a reversal of groundwater gradients occurs from toward (north) Lake Wisconsin to away from Lake Wisconsin (south). Based on the water elevations at Sll21 (776.01) and Wiegands Bay (774'), the Bay does not appear to be perched as does Gruber's Grove Bay.

The horizontal hydraulic gradient in the vicinity of the ballistics and testing area, alcohol and ether areas, and acid area is approximately 0.01 feet per feet to the southsouthwest. Water table elevations in this area range between 828 USGS datum at S1128 to 787 USGS datum at S1126. The water table flattens between S1129 and S1125. The average horizontal gradient between these two wells is approximately 0.007 feet per feet to the south. Water table conditions are complex in the vicinity of S1130, S1131 and S1132. The water level at S1130 was approximately 860 feet whereas the elevation at S1131 and S1132 are 837 and 779 feet, respectively. It appears there was a localized perched water table system in the upper quartzite conglomerate. As noted in the bedrock section of this report, clayey layers were encountered in the conglomerate and apparently caused perched conditions. Therefore, the water level at piezometer S1131 has been utilized as a water table elevation in this area.

Between the February and March water level measurements, Well Sll30 was sampled. As part of this procedure, over 160 gallons of water were bailed from the well. This may have dewatered the perched aquifer. Water level measurements

29

taken as late as July 1980 showed water levels in Well S1130 similar to those in Well S1131. Continued monitoring of this nest is necessary to confirm whether S1130 actually was perched. The water table surface drops roughly 60 feet between S1130 and S1132 (horizontal gradient of 0.03 feet per feet) then becomes flat towards S1122.

The steep horizontal gradients in the northern plant area and the relatively flat water table surface in the central and southern plant areas are probably the result of differential recharge in different areas of the site. Assuming similar surficial soil types throughout the site, recharge from direct precipitation should be approximately equal throughout the entire site area with precipitation being the only source of recharge in the central and southern areas (except from the localized recharge from Lake Wisconsin in the southeast portion of the magazine area). The Baraboo Hills along the northern plant boundaries are composed of relatively impermeable quartzite. Precipitation falling on the southern flanks of the hills will not infiltrate but will run off, downslope, until it infiltrates into the glacial soils at the foot of the hills. Runoff from the hills results in substantially greater volumes of water which are available to infiltrate into the subsoils along the northern site area. Therefore. groundwater mounds up along the northern site boundary then flattens to the south.

Based on groundwater elevations and surface water elevations of the various ponds at BAAP, it appears as though many, if not all, of the ponds are perched (not hydraulically connected to the groundwater system) and act as catchment/infiltration basins for local surface water runoff. Listed below are the surface water elevations and projected water table elevations beneath each pond. The elevation of the surface water in the ponds in Table 3-8 is estimated from topographic base maps and/or inferred from nearby survey points with the water table elevation obtained from the water table map, Figure 3-7.

#### TABLE 3-8

#### SURFACE WATER ELEVATIONS OF PONDS AT BAAP

Pond	Surface Water Elevations	Groundwater Elevations
Nitroglycerin Area	880	778
Ballistics and Testing Area	870	820
Oleum Area	884	820
Magazine Area	844	773
Western Settling Pond	800	765

As previously mentioned in the regional setting section, many of the ponds occupy kettle holes, a depression left when a buried glacial ice block melts. It would appear that the surficial locss deposits which blanket the majority of the site have effectively sealed the bottom of the ponds from the groundwater system.

The following discussion of vertical groundwater flow is based on water levels obtained on March 8, 1980. Other rounds of water levels, included in Table 3-7, indicate similar trends though the values of calculated gradients may vary slightly. Piezometer nests installed during this survey allow for the determination of vertical groundwater flow. Darcy's Law states that water flows from high water levels to low water levels, or from high potential to low potential. This is analogous to stream flow, where water will flow from a high elevation (upstream) to a lower elevation (downstream). With wells screened at different depths, any variation in head between wells within a given nest indicates a vertical difference in Decreasing head with depth indihead and thus vertical flow. cates downward movement or recharge whereas increasing head with depth indicates upward movement or discharge.

At Well Nests Sl104/Sl105/Sl106, Sl113/Sl114 and Sl115/Sl16, the difference in water levels is less than or equal to 0.02 feet. The accuracy of water level measurements is ±0.01 feet. Therefore, the difference in water levels is within the accuracy of measurement and flow at these nests is essentially horizontal. The vertical gradient between Sl102 and Sl103 is upward or discharge, at a value of 0.001 feet per feet. AT Sl101/Sl133, the gradient is downward, or recharge conditions at a value of 0.002 feet per feet. Due to the perched water table conditions at Sl130/Sl131, vertical gradients cannot be calculated at this nest.

#### POTENTIAL CONTAMINANT MIGRATION

In addition to providing information on groundwater flow velocities (direction and speed), the wells at BAAP were also installed for the purpose of monitoring groundwater quality. Toward that purpose, many of the wells were installed adjacent to and on the apparent downgradient side of suspected sources of contamination. Once the water table map was prepared and the baildown tests were completed, estimates of groundwater flow velocities could be made.

Table 3-9 summarizes, by potential source of contamination, groundwater flow velocities (direction and speed) at each source, and indicates which, if any, of the monitoring wells are within the theoretical contaminant plume. Figure 3-8 is a graphic presentation of this table.

#### TABLE 3-9

~ · •

#### GROUNDWATER FLOW VELOCITIES

	Flow Velocities		Distance	Wells Within	Coeffi <b>cient</b> of			
Source	Direction	Speed (ft/yr)	Traveled Since 1942 (ft)	Distance Traveled	Permeability (k)(ft/yr)	Well Number	Water Table Gradient (ft/ft)	Assumed Porosity
Settling Ponds (West End)								
MAXIMUM MINIMUM	S S	68 11	2,580 435	S1102 & S1103 S1102 & S1103	7,316 3,300	S1103 S1102	1.39 x 10 <sup>-3</sup> 1.39 x 10 <sup>-3</sup>	0.15 0.40
Settling Pends (middle)								
MAXIMUM	S	64	2,450	S1104,S1105, S1106	6,959	S1106	$1.39 \times 10^{-3}$	0.15
MINIMUM	S	13	490	None	3,732	S1104	1.39 x 10 <sup>-3</sup>	0.40
Settling Ponds (East End)								
MAXIMUM MINIMUM	SW Sw	<b>43</b> 10	1,640 370	S1108 & S1107 S1108	2,281 2,796	S1108 S1107	2.83 x 10 <sup>-3</sup> 1.39 x 10 <sup>-3</sup>	0.15 0.40
Burning Grounds								
MAXIMOM MINUMUM	S S	3 1	130 50	S1117 None	(480 480	S1117 S1117	$1.04 \times 10^{-3}$ $1.04 \times 10^{-3}$	0.15 0.40
Nitroglycerine Pond								
MAXIMUM MINIMUM	SE SE	30 <0.1	1,140 2	51124 None	8,620 37	S1119 S1124	5.2 x 10 <sup>-4</sup> 4.9 x 10 <sup>-4</sup>	0.15 0.40
<u>Deterrent Burning</u> Area								
MAXIMUM MINIMUM	SE SE	27 7	1,010 380	S1122 None	8,620 8,620	S1122 S1122	4.63 x 10 <sup>-</sup> 4.63 x 10 <sup>-</sup>	0.15 0.40
Sanitary Landfill								
Mamimum Minimum	SE SE	27 7	1,010 380	3 None	8,620 8,620	S1122 S1122	4.63 x 10 <sup>-4</sup> 4.63 x 10 <sup>-4</sup>	0.15 0.40
Cleum Pond								
MAXIMUM	SE	13	510	None	37	S1130 & S1132	4.63 x 10 <sup>-</sup>	0.15
MINIMUM	SE		190	None	37	S1132 S1130 & S1132	4.63 × 10 <sup></sup>	0.40
Ballistics Fond								
MAXIMUM MINIMUM	SSW SSW	141 20	5,350 760	ε1127 & S1126* ε1127	2,029 770	S1127 S1128	$1.04 \times 10^{-2}$ 1.04 × 10 <sup>-2</sup>	0.15 9.40

NOTE: \*Groundwater flow direction is not well defined in the vicinity of Well S1126.

٠

.

Flow velocities were calculated in the following manner. The flow directions were determined from the water table map (Figure 3-7). Water table gradients were also measured from this map and were selected from the vicinity of the potential sources in question. Where data points used to determine the location of water table contours were sparse, the two extremes of the possible water table configuration were used. The two values of porosity represent extreme estimated values for effective porosity (0.15) and total porosity (0.40) for all categories of subsoils encountered during the geotechnical investigation. The coefficients of permeability used for each pair of calculations were the coefficients of permeability measured in wells near the potential source in question. The two extreme values were used.

The formula utilized to calculate speeds for groundwater flow is as follows:

$$S = \frac{ki}{n}$$

- where S = flow speed
  - k = coefficient of permeability

n = porosity

i = water table gradient

Since the measured vertical gradients throughout most of the site were so low, horizontal flow is assumed. The "distance travelled since 1942" was calculated by multiplying the speed (in feet per year) by 38 years. The time required for contaminants to migrate from the ground surface to the water table was not considered, thus assuming a "worst-case" condition.

#### SETTLING BASINS

The locations of the soil borings in the settling basins are shown in Figure 3-9. Boring logs are included in Appendix G. Figure 3-10 shows a longitudinal profile of the settling basins based on these borings and adjacent monitoring wells. The western basin is underlain by recent sediment ranging in thickness from 3 inches at Sl201 and increasing to 5 feet at Sl204. At Sl201, Sl202 and Sl204, the sediment is underlain by a silty clay unit. The clay appears to be texturally similar to wind-blown loess deposits which cover the plant area. At Sl203, the silty clay has apparently been removed during previous dredging operations. The entire western basin is underlain by a clean sand and gravel outwash deposit with depth. The central two basins, as defined by Sl205 and Sl206, are directly underlain by clean sand and gravel deposits.

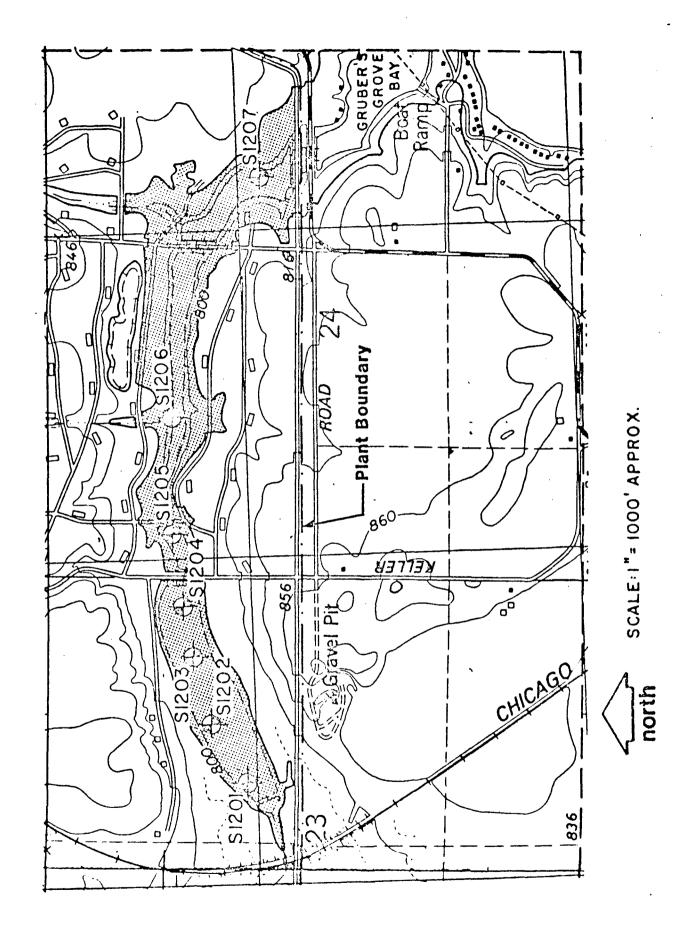
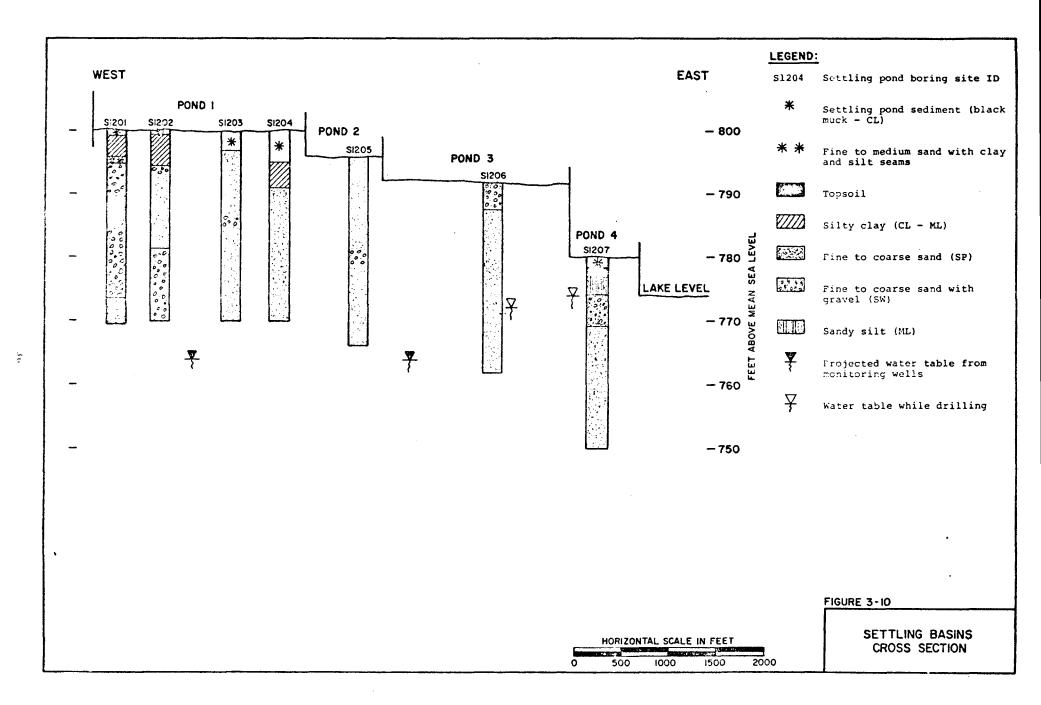


FIGURE 3-9. BORING LOCATIONS - SETTLING BASINS



.

It appears the upper silty clay unit and any previously deposited sediment has been removed. At S1207, located in the eastern basin near Gruber's Grove Bay, approximately 18 inches of recent sediment underlain by a thin layer of topsoil was encountered. Beneath the topsoil, 3 feet of sandy silt is underlain by clean sand and gravel deposits.

Hydrometer analyses of the recent sediment from shelby tube samples obtained at S1203 and S1207 indicate the sediment range between 68 to 70 percent silt and 28 to 32 percent clay (reference Appendix G for soil gradation curves). The liquid limits of the two samples are 32 and 31 with associated plasticity indices of 10 and 15. The USCS classification for both samples would be CL. The results of falling head permeability testing performed on shelby tube sampling from S1203 and S1207 were 6.0 x  $10^{-5}$  cm/sec and 1.2 x  $10^{-7}$  cm/sec, respectively.

#### PROBLEMS ENCOUNTERED DURING THE SUBSURFACE INVESTIGATION

The soils at BAAP proved to be very challenging to drill and The primary cause of the problems encountered was the sample. combination of a wide range in grain size (clay to boulder) and the need to install 4-inch diameter wells. In order to drill a hole large enough to accommodate a 4-inch well, a water well drilling rig had to be used (Ingersoll Rand Cyclone TH100). A soil boring rig such as the CME 750 used at three of the wells (S1101, S1123 and S1124) was not sufficiently powerful to drill a straight hole in the gravelly, cobbly soils large enough to accommodate the 4-inch wells. The TH100, though fully capable of drilling and installing 4-inch wells in the soils at BAAP, was not designed to collect split spoon soil samples. Soil sampling with the TH100, especially at depth, was extremely time consuming. This problem was never satisfactorily overcome.

One of the aspects of split spoon sampling that added to the delays was related to the size of the mud tank (see photos in Appendix G). With the large hole size, a large quantity of drilling mud circulated at high speeds was needed to entrain gravel size particles in the hole. Even though the largest commercially available mud tank was used; the resultant residence time in the tank at this high flow rate was not sufficient to allow the fine sand to settle out. Therefore, in order to clean the hole of both gravel size particles and fine sand prior to sampling, a lengthy period of mud circulation was required after hole advancement had stopped. During this period of mud circulation, initial high mud flow rates were required in order to bring the gravel up out of the hole, followed by slower flow rates to allow the fine sand to settle out in the mud tank.

At a typical water well installation where these high mud flow rates are common, a portable mud tank is not used. Instead, a pit is excavated adjacent to the well location. This pit is sized to allow a long residence time (so that the find sand can settle out) at mud flow rates high enough to entrain gravel. Because the surface soils at the monitoring well locations might be contaminated, the use of an excavated pit was not allowed.

This problem of cleaning out the hole before split spoon sampling was never overcome, although two possible solutions were identified. One of these was to decrease the size of the well to allow a reduction in the size of the hole being drilled. This would have had the effect of allowing a lower mud circulation flow rate (gallons per minute) while maintaining high mud velocities within the hole. If the flow rate were lower, the residence time in the mud tank would increase, thereby allowing the fine sand to settle out. This possible solution was not acceptable to USATHAMA.

The other possible solution was to use a larger mud tank. Since a larger tank would have had to have been specially fabricated, and would have been very awkward to transport, this solution was never tried.

# CHAPTER 4 SAMPLING

The sampling program conducted at BAAP was divided into five categories:

- 1) Surface Soils and Drainageways
- 2) Settling Pond Sediments
- 3) Groundwater
- 4) Terrestrial Vegetation
- 5) Grubers Grove Bay

These categories were chosen on the basis of similar sampling techniques required, types of material sampled, or sampling purpose similarities.

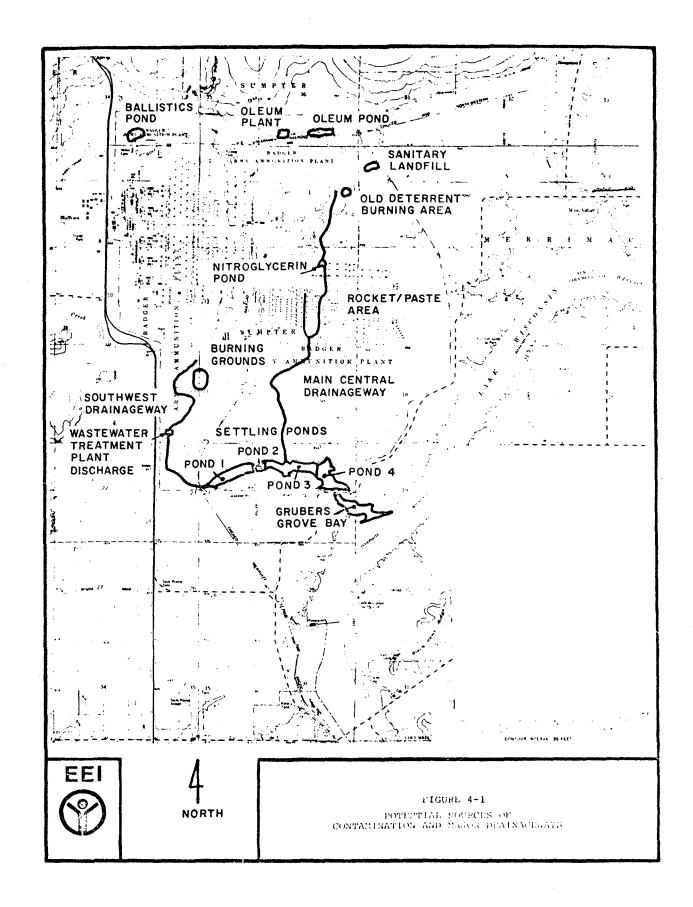
Detailed descriptions of the first three sampling categories are included in this chapter. The sampling and analysis of Grubers Grove Bay was treated as a separate study and is described in Chapter 6.

A description of the terrestrial vegetation sampling program is provided in Appendix H. The terrestrial vegetation sampling was conducted to determine whether aerial infrared (I.R.) photography would be a useful tool for tracking groundwater contamination. This sampling was conducted very early in the investigation at BAAP. Once the preliminary information regarding groundwater occurrence and movement was collected, it became obvious that there was no correlation between the aerial I.R. photography and groundwater contamination; as a result, the sampled vegetation was not analyzed.

## POTENTIAL SOURCES OF CONTAMINATION

Most of the sampling activities conducted at BAAP by EEI were related to one or more potential sources of groundwater and/or surface water contamination. Figure 4-1 illustrates the specific areas at BAAP that were identified by BAAP and USATHAMA personnel as potential sources of surface water or groundwater contamination.





The Ballistics Pond is a closed drainage pond (no surface outlet) which receives the backflush water from the water treatment plant. Alum is used in the water treatment process and is the primary contaminant of concern at the Ballistics Pond. Since the pond has no surface outlet, the only route for contaminant migration would be through groundwater flow. The pond presently contains water.

The Oleum Plant was the manufacturing site for oleum - essentially concentrated sulfuric acid. Part of the manufacuring process involved burning elemental sulfur. A sulfur storage area was located on the west end of the plant and there is still sulfur residue in the area. It has been partially eroded into a small, low lying marshy area immediately north of the concrete storage pad. Scattered traces of elemental sulfur were also noted throughout the vicinity of the Oleum Plant. Since surface drainage in the vicinity of the Oleum Plant is poorly defined, the most likely potential route for contaminant migration would be through leaching and groundwater flow.

Another aspect of the oleum manufacturing process produced a sulfuric acid wastewater. This wastewater was neutralized with calcium carbonate and discharged to the <u>Oleum Pond</u>. This pond is also a closed drainage pond. According to BAAP personnel, the discharge during peak production activities was quite high, and yet the pond never completey filled. The pond is now dry. Since there usually is no significant net annual evaporation (precipitation  $\approx$  evaporation) in this part of Wisconsin, this implies that most of the discharged wastewater recharged the underlying aquifer.

One of the neutralization products that was generated by the treatment process was gypsum ( $CaSO_4 \cdot 2H_2O$ ). Gypsum is moderately soluble in water. Therefore the primary contaminant of concern at the Oleum Pond is sulfate and the only possible route for migration would be through groundwater flow.

The Sanitary Landfill has been in operation since BAAP was built. It has handled essentially all of the non-contaminated solid waste generated at BAAP. The primary contaminant of concern from this potential source would be leachate from a general refuse landfill, and the primary migration route would be through groundwater flow.

Some of the contaminated combustible material and off-specification deterrent generated at BAAP was disposed of at the <u>Old Deterrent Burning Area</u>. The method of disposal involved open burning in what was apparently an old gravel pit. This area is no longer being used. Because of the variety of materials handled at this site, almost any of the industrial compounds used at BAAP could be found here. Since the site is in a closed depression, leaching/groundwater flow is the only potential contaminant transport mechanism.

Part of the process used at BAAP to produce nitroglycerin generated a wastewater which contained trace amounts of nitroglycerin. This wastewater was discharged to the Nitroglycerin This pond is part of the major drainageway which Pond. drains the central manufacturing and storage areas of BAAP. There is a large, low-lying area immediately to the east of the Nitroglycerin Pond which appears to have received some of the overflow from the pond, possibly during a heavy rainfall The primary contaminant of concern at the Nitroglycerin event. Pond is nitroglycerin. Two potential mechanisms for contaminant migration exist at this site: leaching/groundwater flow and surface runoff. The pond currently contains water.

All of the contaminated (by explosives) refuse that is generated at BAAP is now taken to the <u>Burning Grounds</u>. If the refuse is non-combustible, it is flashed to decontaminate it and then hauled off-site for disposal or salvage. If the refuse is combustible, it is burned at one of the burning pads (graveled pad) or burning pits (deep, narrow excavations). Because of the variety of materials handled at this site, any of the industrial compounds used at BAAP may be present. Because of the topography of the site, surface runoff would probably not be an effective contaminant transport mechanism. Leaching/ groundwater flow is a more likely means of transporting contaminants from this site.

The industrial <u>Wastewater Treatment Plant</u> received wastewater discharges from the acid area and the ball powder area. Treatment consisted of neutralization with calcium carbonate, followed by discharge to the <u>Settling Ponds</u>, and ultimately Grubers Grove Bay and Lake Wisconsin. The primary contaminants of concern from these sites would be sulfate, nitrocellulose, diethylpthalate (DEP), di-n-butylphthate (DBP), diphenylamine (DPA), and 2,4-DNT. Both surface runoff and leaching/groundwater flow are potential mechanisms for contaminant migration from these sources. The settling ponds are now almost completely dry.

The main central drainageway is partially fed by a series of drainage ditches in the <u>Rocket/Paste Area</u>. Though no wastewater was generated in this area, a deluge system to control fires was operated and runoff from this system emptied into the drainage ditches. Lead salts were reportedly visible in the bottoms of these ditches at one time, and therefore the primary contaminant of concern in these ditches is lead. The primary mechanism for contaminant migration is surface runoff.

### SURFACE SOILS AND DRAINAGEWAY SAMPLING

#### Purpose and Location

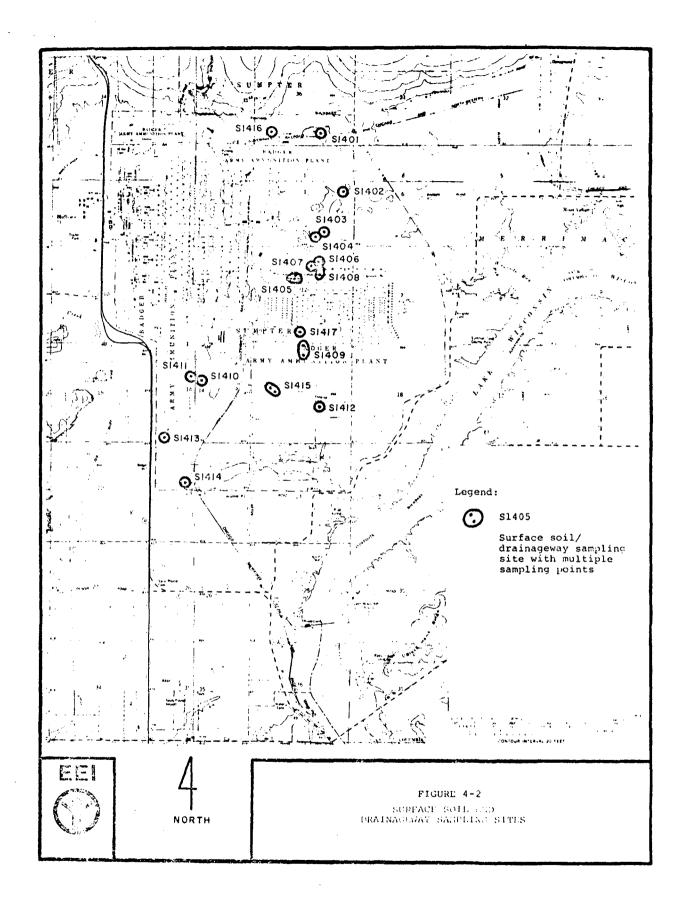
Sampling in this category had two main purposes: 1) to sample the potential sources of contamination in order to verify the presence of suspected contaminants of concern and to identify any other contaminants present; 2) to trace any contaminant migration from a suspected source along surface water runoff routes.

Figure 4-2 shows the locations of the sampling sites for this category. Table 4-1 indicates which of these sites is located directly within a suspected source of contamination. Site S1403 is located in the large low-lying area to the east of the Nitroglycerin Pond which may have received overflow from the pond during periods of flooding. Site S1406 is located in a small pond directly downstream from the Nitroglycerin Pond. Sites S1405, S1407-S1409, S1415 and S1417 are in the Main Central Drainageway and in ditches within the Rocket/Paste Area that feed this drainageway. These sites were positioned so that any contaminants migrating via surface water runoff from either the Nitroglycerin Pond or the Rocket/Paste Area could be traced. Site S1412 is located away from the main drainageway in a small, closed depression that was devoid of vegetation. Site S1414 is located in the Southwest Drainageway downstream from the Wastewater Treatment Plants and upstream from the Settling Ponds. This site was located to trace contaminant migration from the Wastewater Treatment Plant to the Settling Ponds.

## Sampling Procedure

This category of sampling consisted primarily of the collection of surface soil samples or soil/sediment samples in dry drainageways or ponds. At four of the sites in this category there was water present during sampling. These sites were S1404, S1406, S1413 and S1414.

The water samples at sites S1404 and S1413 were taken as grab samples during the July, 1980 sampling trip. They were collected by submerging the sample containers and allowing them to fill completely. This was done before collection of the sediment samples at these sites. At site S1413 the stream was very narrow (less than one meter wide) and



# POTENTIAL SOURCES OF CONTAMINATION

Potential Source	Site IDs of Samples Collected Directly from Source		
Ballistics Pond	None collected		
Oleum Pond	S1401		
Oleum Plant	S1416		
Old Deterrent Burning Area	S1402		
Sanitary Landfill	None collected		
Nitroglycerin Pond	S1404		
Burning Grounds	S1410, S1411		
Settling Ponds	All Sl200 samples (shown on Figure 4-4)		
Wastewater Treatment Plants	S1413		

flowing strongly. The sample was collected from the center of the stream. At site S1404 (Nitroglycerin Pond), the sampling crew carefully waded out into the pond, trying to avoid disturbing the sediment, to approximately waist deep water. The sample containers were then filled from below the thermocline which had developed at a depth of about 60 centimeters.

The soil and sediment samples were all collected using a shelby tube sampler (see Figure 4-3), except at site S1404 (Nitroglycerin Pond) where a soil spade was used. The 30-inch long (76 cm), 2-inch diameter (5 cm) shelby tubes were cut in half to produce sampling tubes approximately 15 inches long (38 cm), thus allowing 12-inch (30 cm) cores to be collected at each site. The shelby tubes and all sample containers were cleaned in EEI's laboratory according to USATHAMA specifications prior to shipment to BAAP. A different shelby tube was used at each site.

All of these soil/sediment samples were composites of three to five subsamples collected at each sampling site. The orientation of these subsampling locations was sketched in the sampling log. The number and orientation of the subsamples was determined in the field by the geologist/soil scientist collecting the sample and was based on an attempt to achieve a composite which was representative of the sample site locale. The samples were visually classified and described in the sampling log.

The subsamples were partially composited in the field. A porcelain-lined tub and stainless steel spoon were used for compositing. The tub and spoon were cleaned with potable water between sampling at each site.

## SETTLING POND SEDIMENT SAMPLING

#### Purpose and Location

The Settling Ponds were constructed to settle out the suspended particulate matter from the wastewater discharged by the industrial treatment plant. According to BAAP personnel, the settled sediment was removed from some of the ponds several years ago. A dragline was used and the excavated sediment was piled along the north and south edges of the ponds. This excavated sediment and the sediment still remaining in the ponds were suspected of containing several contaminants.



# thin wall tube sampler

## \*\* (Meets ASTM-ASCE-DCDMA-AASHO Standards)

(3)

(4)

(5)

This sampler is designed to take undisturbed samples in cohesive type soils and clays . . . The thin steel tube containing the sample may be removed from the sampler head and used as a container to transport sample to laboratory thus avoiding any damage to sample or costly delays in operation. In practice several replacement tubes are carried by crew to minimize disturbance, preserve moisture and cut down on delays in sampling procedure. The thin wall tube is made available in either steel or brass and in varying lengths. This sampler is also commonly called a "Shelby" or "Chicago" thin wall sampler. The procedure for taking samples is outlined under ASTM Standard Procedures, whereby the sampler is pressed into the undisturbed clay or silts by hydraulic force of drilling rig or by a rig "pull down" method. The sampler head features vent holes and a ball check to release pressure within the tube during pressing of sample and to prevent wash water from re-entering tube on recovery of sample from the bore hole.

	*Length of Steel Tube		Rođ		Weight	
Size	Inches	MM	Conn.	Part No.	Lbs.	Kg. I
2" O.D. x 1-7/8" I.D. **	30''	762	AW	22007-8	7.0	3.1
(50.8 x 47.7:mm)	36''	914	l	22007-10	8.0	3.6
	54''	1371		22007-12	10.0	4.5
2½" O.D. x 2-3/8" I.D.	30''	762	AW	22027- <b>8</b>	11.0	4.9
(63.5 x 60.3mm)	36''	914		22027-10	12.0	5.4
	54''	1371		22027-12	14.0	6.3
3" O.D. x 2-7/8" I.D. **	30''	762	NW	22012-8	16.0	7.2
(76.2 x 72.0mm)	36''	914	1	22012-10	16.5	7.4
	54''	1371		22012-12	19.0	8.6
3½" O.D. x 3-3/8" I.D.	30''	762	NW	22058-8	20.0	9.0
(88.9 x 84.6mm)	36''	914	l	22058-10	21.0	9.5
	54"	1371		22058-12	23.0	10.4
4½" O.D. x 4-3/8" I.D.	30"	762	NW	22032-8	24.0	10.8
(113.7 x 110.5mm)	36″	914	l	22032-10	27.0	12.2
	54"	1371_		22032-12	31.0	14.0
5" O.D. x 4-7/8" I.D. **	30''	762	NW	22035-8	36.5	16.5
(127.0 x 105.9mm)	36"	914		22035-10	39.0	17.6
	54''	1371		22035-12	43.0	19.4
2-1/8" O.D. x 2" I.D. **	30''	762	AW	22110-8	7.5	3.4
(53.9 x 50.8mm)	36″	914	l	22110-10	8.5	3.8
	54"	1371		22110-12	10.5	4.7

#### THIN WALL TUBE SAMPLER

\*Sample length is  $2\%^{\prime\prime}$  (63.5 mm) shorter than tube length . . .

## OPTIONAL AND SPARE PARTS FOR THIN WALL SAMPLER

	Diameter and	2" 0.0	).	2-1/2" C	.a.	3" 0.0	<b>)</b> .	3-1/2" 0	).D.	4-1/2" 0	.D.	5" O.	D.	2-1/8" C	o.o.
	Head Thread Conn,	AW	Wgt. Lbs.	AW	Wat Lbs.	NW	Wat.	NW	Wgt.	NW	Wgt.	NW	Wolt.	AW	Wigt. L.bs.
Item No.	Name of Part	Part No.	Kg.	Part No.	Kg.	Part No.	Kg.	Part No.	Ky.	Part No.	Kg.	Part No.	Kn.	Part No.	Kg.
1.	Head Assembly "W"	22033-3	4.0	22033-7	7.0	22033-5	11.0	22033-23	13.0	22033-11	17.0	22033-16	21.0	22033-37	7.0
			1.8	İ	3.1		4.9		5.8		7.7		9.5		3.1
2.	Ball	90213-18		90213-18	•	90213-18	•	90213-18	•	90213-18	*	90213-18	•	90213-18	•
			•		•	[	•		•		٠		•		•
3.	Rollpin	90107-251	•	90107-251	•	90107-251	•	90107-251	•	90107-251	•	90107-368	•	90107-251	•
			•		·		Ŀ		•		•		•		•
4.	Cap Screw (4 Req'd)	120660	•	120652	•	120652	•	120652	•	120652	•	120652	•	120660	•
			•		*		Ŀ		•		•		•		
5.	Steel Tube - 30"	120021-4	3.0	120086-4	4.0	120037-4	5.0	120093-11	7.0	120095-4	7.0	120109-4	8.5	120629-4	4.0
			1.3	[	1.8		2.2		3.1		3.1		3.8		1.8
5.	Steel Tube 36"	120021-5	4.0	120086-5	5.0	120037.5	5.0	120093-12	8.0	120095-5	10.0	120109-5	12.0	120629-5	5.0
		}	1.8		2.2	]	2.2		3.6		4.5	•	5.4		2.2
5.	Steel Tube- 54"	120021-6	6.0	120086-6	7.0	120037-6	9.0	120093-13	10.0	120095-6	13.0	120109-6	15.0	120629-6	7.0
		L	2.7	l	3.1		4.0		4.5		5.8		6.7		3.1
5.	Brass Tube30"	120022-4	4.0	120085-4	4.0	120038-4	6.0	120092-10	7.0	120094-4	7.0	120108-6	8.0		-
		1	1.8		18	1	2.7		3.1		3.1		3.6		· · ·

Note: Sample length is 212" shorter than tube length.

\*Less than one pound or .45 kilogram.

As described in Chapter 3, these settling ponds are "perched", i.e. the ponds are above the water table. This condition would tend to encourage the leaching of contaminants out of the sediments and into the underlying aquifer. Since these ponds (now essentially dry year round, except during periods of heavy runoff) still drain into Grubers Grove Bay, contaminated sediment in the ponds could be eroded and washed out into the bay during flooding.

The locations of the sampling sites in the Settling Ponds are shown on Figure 4-4. The surface grab sample locations were positioned in areas where the excavated sediment had been placed. The borings were taken from the bottoms of the ponds in order to determine the depths to which contaminants had leached.

## Sampling Procedure

Settling pond boring samples were collected by Warzyn Engineering, Inc. personnel under the direction of EEI field sampling teams. The samples were collected to a depth of 30-feet and were split into three sample fractions. The upper, fine-grained sediments were collected as the first fraction. These sediments consisted of material deposited after the settling ponds had been constructed and were easily discerned from the coarse, gravelly underlying soils. The sediments ranged in thickness from 0 to 5 feet. The soils collected from the rest of the 30 foot depth were split into an upper and a lower fraction of approximately equal intervals. Table 4-2 shows the approximate depths from which each fraction was collected.

The samples were collected using either a 3-inch split spoon sampler or a 4-inch diameter section of drill casing with a coring bit. The type of sampler used was recording in the boring log. Copies of the boring logs are included in Appendix G.

At a given boring location, each of the three fractions was composited into a separate container in the field. The type of container selected depended on the amount of sample collected and was either a wide-mouth quart amber glass jar, a wide-mouth one-gallon clear glass jar, or a wide-mouth clear 2-1/2-gallon jar. The jar lids all contained teflon liners, and jars and lids were cleaned according to USATHAMA sample container cleaning procedures in EEI's laboratory prior to shipment to BAAP.

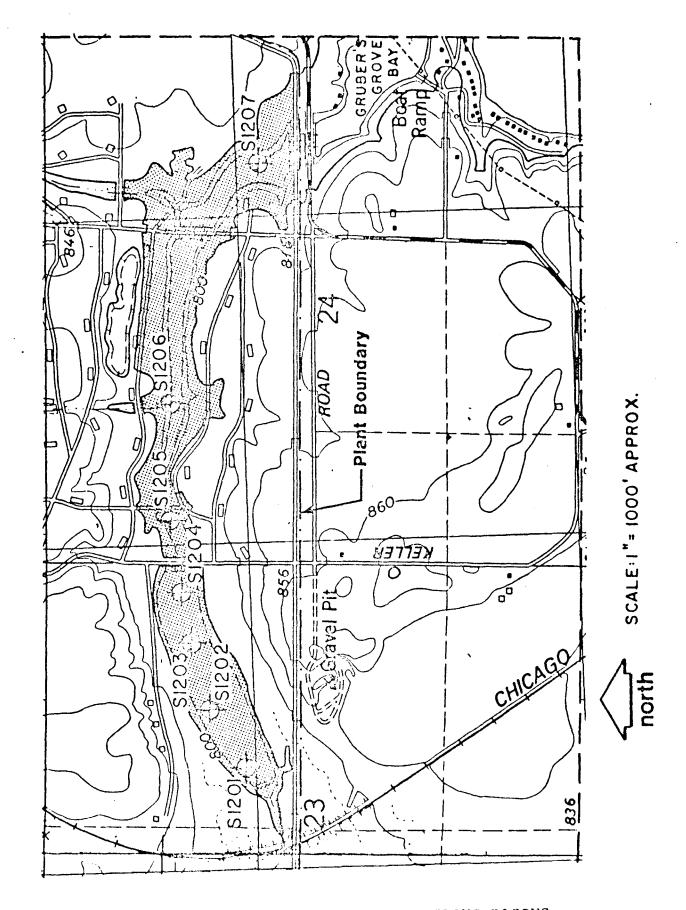


FIGURE 4-4. BORING LOCATIONS - SETTLING BASINS

SETTLING P	POND	SEDIMENT	THICKNESSES
------------	------	----------	-------------

Pond No.	Site ID	Sample No.	Depth Interval (feet)	Soil or Sediment
1	S1201	D5018	0-2	Sediment
1	S1201	D5019U	2-16	Soil
1	S1201	D5019L	16-30	Soil
1 1 1	S1202 S1202 S1202	M0001 D5020, D5020U, D5020S D5021	0-2 2-16 16-30	Sediment Soil Soil
1	S1203	M0002	0-3	Sediment
1	S1203	D5022	3-16	Soil
1	S1203	D5023	16-30	Soil
1	S1204	M0003	0-5	Sediment
1	S1204	D5024C	5-19	Soil
1	S1204	D5026	19-30	Soil
2	S1205	D5027	0-15	Soil
2	S1205	D5028	15-30	Soil
3	S1206	D5029	0-15	Soil
3	S1206	D5030	15-30	Soil
4	S1207	M0004	0-2	Sediment
4	S1207	D5031	2-15	Soil
4	S1207	D5032	15-30	Soil
N-Side of Pond 2	S1205	M0050	0-1	Sediment & Soil
N-Side of Pond 3	S1206	M0051	0-1	Sediment & Soil

#### GROUNDWATER SAMPLING

## Purpose and Location

Groundwater samples were collected from 29 wells (Table 4-3), including 25 wells which were drilled specifically for this project, three monitoring wells which the U. S. Army Corps of Engineers drilled at the request of the Wisconsin Department of Natural Resources, and one deep production well which is part of the BAAP water supply system (Figure 4-5).

The locations where well samples were collected were chosen on the basis of two criteria. Certain samples were collected from areas upgradient from any potential sources. These samples were used as controls, or as a point of reference against which the analytical results of the other samples could be compared. These control samples are listed in Table 4-4, and their locations are shown on Figure 4-5.

The rest of the sample sites were selected for their hydrologic relation to suspected sources of contamination. Conceptually, these sites were in the most probable downgradient direction along the potential pathways for migration.

#### Sampling Procedure

The groundwater sampling program consisted of three phases: the purging of the wells prior to sampling, redevelopment, and the actual collection of samples.

<u>Purging</u> - When a well is drilled, installed, and developed, the groundwater environment is disturbed for some unknown distance around the well. By removing some of the soil, replacing it with a different type of soil (in this case, a filter sand), injecting drilling mud into the aquifer through drilling, and mixing and aerating the well through development procedures, the water chemistry in the aquifer is undoubtedly altered. Purging a well consists of removing a large quantity of water from the well prior to collecting a sample. The intent is to remove this altered water so that the sample collected is representative of the surrounding, undisturbed water.

Because the amount of water that has been altered is unknown, it is generally believed that the more thoroughly a well is purged before sampling, the more representative the sample will be. There are certain exceptions to this general rule, but within the limits of this study and for the types of aquifers encountered at BAAP, EET believes that this rule holds true.

# AMOUNT OF WATER PURGED FROM WELLS

.

.

Well No. Sllxx		ped or ed/Date	Quantity of Water Purged (Gallons)
02	P	2/20/80	382
02	Р	6/30/80	227
03	P/B	6/30/80	461
04	P	2/20/80	369
04	Р	7/1/80	331
05	P/B	7/2/80	288
06	Р	7/1/80	390
07	Р	2/25/80	377
07	Р	7/2/80	336
08	P	2/25/80	416
08	Р	7/2/80	479
09	P	2/26/80	372
09	Р	7/3/80	474
11	Р	2/27/80	87
11	Р	7/2/80	123
12	Р	2/26/80	441
13	P	7/7/80	198
15	Р	2/26/80	384
17	Р	2/27/80	217
17	В	7/11/80	111
19	Р	2/27/80	238
21	P	2/27/80	573
21	Р	7/7/80	264
22	Р	2/21/80	342
22	Р	7/3/80	195
23	В	2/22/80	150
23	В	7/8/80	111

52

-

# AMOUNT OF WATER PURGED FROM WELLS (Continued)

Well No. Sllxx		ped or ed/Date	Quantity of Water Purged (Gallons)
24	В	7/9/80	44 <sup>(d)</sup>
25	P/B	2/27/80	42 <sup>(a)</sup>
27	Р	2/21/80	313
28	Р	7/7/80	294
30	В	2/28/80	161
30	В	7/9/80	111
31	В	7/9/80	120
32	Ρ	7/7/80	325
33	Р	2/28/80	415
33	P	7/3/80	346
34	В	2/29/80	4.2 <sup>(b)</sup>
34	в	7/11/80	11.2 <sup>(b)</sup>
35	В	7/10/80	8.8 <sup>(b)</sup>
36	В	7/12/80	21 <sup>(b)</sup>
37	Р	7/8/80	Not Calculated <sup>(c)</sup>

NOTES:

- (a) Well S1125 had only 10.4 feet of water in it at the time of sampling.
- (b) Wells S1134, S1135 and S1136 are 2-1/2 inch diameter wells installed by the Corps of Engineers, also shown as DNR Well Nos. 2, 3 and 1, respectively, on same figures.
- (C) BAAP production well. Pump had been operating for several hours prior to time of sample collection.
- (d) Well S1124 has a very low specific capacity. The amount of water purged shown above does not include the amount of water surged and immediately removed during the attempt to redevelop the well.
- (e) Amount of water purged does not include the amount removed during development.

# CONTROL SAMPLES

<u>Site ID</u>	Category	Remarks
S1123	Groundwater	All Parameters - Outwash Well
S1128	Groundwater	All Parmeters - Bedrock Well
S1130	Groundwater	All Parameters - Bedrock Well
S1131	Groundwater	All Parameters - Bedrock Well

•

54

EEI proposed to purge a minimum of 65 gallons of water from the water table wells (five pipe volumes) and somewhat more than 65 gallons from the piezometers to account for the greater amount of stagnant water in the piezometer casings. Table 4-3 compares these minimum amounts to the amount of water actually purged before sampling. Wherever feasible, more than the minimum amount of water was purged in an effort to obtain a better sample.

Two methods of purging the wells were employed at BAAP. For those wells with a high enough specific capacity, a standard, deep well submersible pump was used. The discharge line consisted of 200 feet of 5/8-inch ID reinforced neoprene garden hose. The hose was taped to the power cable, and both were wound on a large wooden spool. The pumps were lowered and raised by a power winch. Two different pumps were used - a 3-inch REDA, and a 4-inch TEEL. The REDA pump was preferred, since the 4-inch (nominal) diameter TEEL pump was a snug fit inside the 4-inch diameter wells.

For those wells with low specific capacities, a bailer was used to purge the wells. For all of the 4-inch diameter wells having low specific capacities (23, 24, 25, 30 and 31), a 3-inch diameter TIMCO bailer was used. This is an all-PVC bailer with a ball-type check valve and comes in 15-inch sections (flushjoint threaded couplings), which enables it to be thoroughly cleaned and of variable length. Well 17 was purged with a TIMCO bailer on the second sampling trip due to mechanical problems with the pumps. For purging the three 2-1/2-inch "DNR" wells (34, 35, 36), a 1-1/2-inch PVC bailer was used. This bailer had a galvanized reducing bushing and one-inch brass foot valve.

For purging, the TIMCO bailer was lowered and raised on a braided polypropylene rope which was run through a snatch block on a tripod. The rope was attached to a van and the van was driven back and forth to lower and raise the bailer. Using this system, a bailing rate of approximately 1-1/2 to 2 gallons per minute was achieved. In several instances, this exceeded the production capacity of the well. The 1-1/2-inch bailer was lowered and raised on a braided polypropylene rope by hand for wells 34 and 36, and by van for well 35.

Redeveloping - Four of the monitoring wells at BAAP had unexpectedly low yields. These were wells Sll24, Sll34, Sll35 and Sll36. Well Sll24 was installed by Warzyn Engineering, Inc. as part of this study, and wells Sll34-Sll36 were installed earlier by the U. S. Army Corps of Engineers. Because these wells had unexpectedly low yields, they may not have been completely developed when they were installed. Therefore an attempt was made during the July, 1980 sampling trip to redevelop these wells through swabbing and surging.

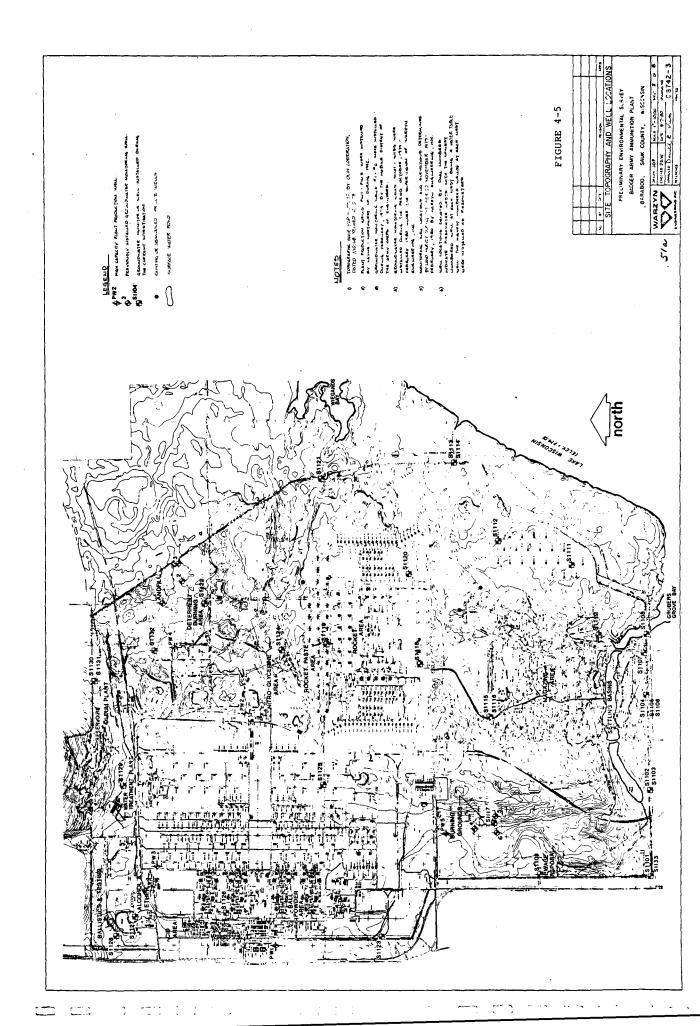
For swabbing the wells a heavily weighted, snug fitting sealed bailer was used. It was violently raised and lowered throughout the screened section of the well to create strong turbulence. This turbulence tends to loosen some of the fine grained material which may be plugging the screen.

Surging the wells consisted of rapidly pouring clean water from the BAAP potable water supply or water which had been bailed from the well back into the well in an effort to create a strong backpressure. The added water was then quickly removed by bailing. This combination of swabbing/surging/ swabbing appeared to be only marginally effective at wells S1124, S1134 and S1136, where no noticeable increase in yield was obtained. At well S1135, a distinct increase in yield was noticed between the initial baildown and the post-development purging operations.

Sampling - All of the 4-inch diameter wells (except wells 6, 28 and 32) were sampled with a 3-inch diameter TIMCO bailer. Samples from wells 6, 28 were collected directly from the discharge hose of the pump since these samples were analyzed for inorganic constituents only. Samples from wells 34, 35 and 36 ("DNR" wells 2, 3 and 1, respectively) were collected using the 1-1/2-inch diameter bailer.

Well sampling was conducted during winter and summer. The winter sampling procedure differed slightly from the summer procedure. During the winter trip, for those wells purged using a submersible pump, the bailer was cleaned between wells using water from the BAAP potable water supply system. For those wells purged by bailing (during both winter and summer sampling), the bailer was not cleaned between wells. The purging procedure alone effectively prevented any cross contamination between wells, as confirmed in all cases by the analytical results. During the summer sampling trip, for those wells purged with a submersible pump, part of the discharge from the pump was collected in a 50-gallon nalgene drum. The bailer was then cleaned using water from the well to be sampled.

The type, size, and number of sample containers filled at each well varied according to the required analyses. Most well samples required at least some organic analyses, and quart amber glass bottles with Teflon lid liners were used for these



samples. Other containers typically used were pint plastic bottles, quart cubitainers, and 40 milliliter screw top, septum seal vials. The containers were cleaned according to USATHAMA specifications in EEI's laboratory prior to shipment to BAAP.

Because of the volume of sample desired, two or three retrieves of the bailer were usually required to fill all of the containers. The quart amber glass bottles were filled first from the bailer, and the plastic containers and 40 milliliter vials were then filled from the quart amber glass bottles. The amber glass bottles were then refilled from subsequent retrieves of the bailer.

The bailers were lowered and raised by a variety of methods. These methods included using the van, the power winch, and manual (hand) retrieval. The method selected depended on depth to water, method of purging the well, size of the bailer, and how fatigued the sampling crew was at the time. Each method used was recorded in the sampling log.

After the sample containers were filled, they were placed in Coleman coolers and iced. The samples were kept on ice (or refrigerated) until they were packed for shipment. The samples were packed for shipment in Coleman coolers, iced, and shipped by air freight to EEI's laboratory at least every two days. The samples collected on the final day of each sampling trip were transported by van to EEI's laboratory (an eight hour trip).

# CHAPTER 5 CHEMICAL ANALYSIS

#### ANALYTICAL METHODOLOGY

The analytical methods employed during this survey are summarized in Table 5-1 and are included in Appendix I. Whenever possible, EEI tried to utilize standard EPA or Army methodology and thus avoid methods development. Methods modification was required, however, for the analysis of 2,4-DNT and nitroglycerin in water and soil and for nitrocellulose in soil.

During the GC/MS analyses of soil and sediment samples, some problems occurred with the high background in the samples which necessitated reruns at dilutions of the original extract. The soil and sediment samples also proved difficult to handle during the GC analysis. Interferences were encountered with the diethyl phthalate peak. The presence of extraneous (interference) peaks reduced the sensitivity of the explosives (2,4-DNT and nitroglycerin) methods on soils and sediments. It was difficult to establish the correct GC conditions for the analysis of the explosives due to the instability of the compounds in the injection port and the necessity to lower injection port temperatures.

One of the problems encountered was the formation of a celluloselike film after extraction of high-level soil samples for nitrocellulose analyses. This film formed in the extracts after they had been standing for a period of time. Analysts found that filtering the samples after the film appeared lowered results even in the standards. Filtering immediately and using smaller sample aliquots after extraction, however, appeared to solve the problems. Initial experiments to determine the detection limit of nitrocellulose in water also had to be repeated because the initial spiking levels (based on an assumed detection limit) were too low. The detection limit was found to be in the ppm rather than the ppb range.

Despite extensive cleanup using gel permeation chromatography, fish tissue samples showed a large number of extraneous peaks.

There was some difficulty in determining the detection limit for nitroglycerin and phthalates as well as endrin and  $\beta$ -BHC due to poor recovery of blank water spikes at low concentrations. Values were eventually obtained by spiking at higher concentration levels for all parameters except diethylphthalate (DEP). The problems with this and other parameters were discussed during a meeting with USATHAMA personnel. Instructions received from

## TABLE 5-1

٠

.

.

#### ANALYTICAL METHODOLOGY

Parameter	Code	Method (A)
Alkalinity	ALK	Method 310.1 <sup>(b)</sup> -titrimetric
Alkalinicj		
Carbon tetrachloride	CCL4	EPA - Fed. Reg. Vol. 44, No. 231, 68683-68690- Liquid - Liquid Extraction + GC/EC
		· · ·
Chemical Oxygen Demand	COD	Method 410.1 <sup>(b)</sup> -titrimetric
		(b)
Conductance	COND	Method 120.1 <sup>(b)</sup> -meter
Hardness	HARD	Method 130.2 <sup>(b)</sup> -titrimetric
Λιαπομία	HN 3N2	Ameonia nitrogen in bottom sediments, compiled by Creat Lakes Region Committee on Analytical Methods, EFA December 1969, pp. 28-31, with color development according to EFA 350.2, section 7.4.
Nitrate	NO 3	Method 353.2 <sup>(b) (c)</sup> -
Nitrite	NOZ	Colorimetric. Automated
рН	PH	Nethod 150.1 (0) -electrometric
Sulfate	SO4	Method 375.2 (b) (c) -Colorimetric, Automated
Sulfide	SULFID	Method 376.1 (b) -titrimetric
Total Kjeldahl nitrogen	N2KJEL	Colorimetric, Automated Method 150.1 (b) -cleatrometric Method 375.2 (b) -Colorimetric, Automated Method 376.1 (b) -titrimetric Method 351.3 (b) -Colorimetric
Cation Exchange capacity	CEC	Method 57-2.1, Methods of Soil Analysis, No. 9,
•		American Society of Agronomy, 1965.
Pesticides and PCB's		Water - Method for organo-chlorine pesticides in
a-BHC	ABHC	industrial effluents - Fed. Reg., 38, No. 75, Pt. II.
B-BIC	BBHC	
б-вис	DBHC	Soils and sediments - Method for analysis of PCB's,
Chlordane	CLDAN	pesticides, and phthalates in soils and bottom sediments-
Dieldrin	OLDRN	EFA Region V, CRL Method No. 2.198 thru 207.
Endrin	ENDRIN	
δ-endosulfan	AENSLF	
β-endosulfan	BENSLF	
Heptachlor	HPCL	
Lindane	LIN	
4,4'-DDD	PPDDD	
4,4'-DDE	PPDDE	
4,4'-DDT	PPDDT	
Toxaphene	TXPHEN	
PCB-1016 PCB-1221	PCB016 PCB221	
PCB-1232	PCB232	
PCB-1242	PCB242	
PCB-1248	PCB248	
PCB-1254	PCB254	
PCB-1260	PCB260	
Dibutyl phthalate	DBP	Phthalate esters -
Dibutyi phthalate Diethyl phthalate	DEF	USEPA Method 606 - GC
	<del>.</del>	
2,4-dinitrotolucne	2,4-DNT	EPA Method 609 with
nitroglycerine	NG	modification - GC+EC
nitrocellulose	NC	Army NC-WA-01 with sample preparation - Automated/Colormetric
Metals <sup>(d)</sup>		
Silver	AG	Method 272.2 (b) -AA
Aluminum	AL	Method 202.1, 202.2 <sup>(b)</sup> $-AA$
Ausenic	AS	Nuclear TOE 2(b)
Berryllium	BE	Nethod 210 2 <sup>(D)</sup> = A
Cadmium	CD	Method 213.2 2 ~AA
Christian	CR	Method 218.2 11 -AA
Copper	CU	Method 220.2 $\binom{b}{b}$ -AA
Iron	FE	Method $230.2$ (b) $-AA$ Method $236.1$ (b) $-AA$
Mercury	163	
Nickel	141	$\begin{array}{llllllllllllllllllllllllllllllllllll$
Lead Not inverse	PB CB	Method 239.1 th 239.2 MA
Antiseny Selenium	SB SE	Method 204.2 (b)
Tin	SN	Method 270.2 $(b) = A\lambda$ 20.1 $(1)^{202.2} (b) = A\lambda$
Alial Li um	TL TL	
Zinc	2N	Method (289.2 (b) -AA

:

•

#### TABLE 5-1

#### ANALYTICAL METHODOLOGY (Continued)

Code

\_

#### Parameter

Gas Chromatography/ Mass Spectrometry Method<sup>(a)</sup>

Volatile organics analysis (VOA) by CC-MS EPA Method 624

Non-volatile organics by GC-MS EPA Method 625

Fish tissue by GC/MS Cleanup by gel permeation as in Chapter 3, Section 4, EPA Manual for Organics Analysis Using GC-MS. Analysis by EPA Method 625

NOTES: (a) See methods included as Appendix I.

(b) Method as it appears in "Methods for the Chemical Analysis of Water and Wastes", USEPA, 1979.

(c) Soil and sediment samples prepared using "Preparation of Soils and Sediments for the Analysis of Nitrate, Nitrite, and Sulfate" (See Appendix J).

(d) Where two methods are specified, the flame method was used for high levels and the furnace technique for low levels. Samples were prepared for analysis using the EPA methods included in Appendix I.

# USATHAMA for completion of the project did not, however, include reanalysis for DEP detection limit determination.

Problems were also encountered during the initial attempts to determine a detection limit for aluminum in water. This was also reported to USATHAMA, but was not mentioned in the instructions received for completion of the quality control portion of the project.

In addition to the problems discussed above, nitroglycerin analyses proved to be difficult due to the apparent instability of the compound in extracts as observed with standards in the laboratory. Therefore, values obtained for samples during the screening phase were considered minimum levels of the pollutant. In order to confirm these levels, some sites were resampled during verification with arrangements made for immediate extraction and subsequent analysis by the laboratory.

## Results

Appendix I presents a summary of the analytical results of the survey. The data in these tables is presented in two formats by parameter and by site. The numbers presented in these tables are expressed in micrograms per liter for water samples and micrograms per gram for soils and sediments (unless otherwise indicated). The symbol "<" followed by a numerical value indicates that the reported value is less than the detection limit as determined by the method of Hubaux and Vos, taking into account the dilution (if any) of the sample.

The results of the GC/MS scans present qualitative results of the screening of samples for unspecified compounds. The tables of data summarizing the GC/MS library searches (identifications of unknowns) contain a column entitled "Similarity Index". The values reported in this column give an idea of how well the mass spectrum of the corresponding compound as recorded in the library matches that of the unknown. A perfect match would have an assigned value of 1.0000. For water samples, three fractions were analyzed: a volatile fraction, an acidic extract and a base-neutral extract. For soil and sediment samples, a volatile fraction was not analyzed. The compounds identified are listed in order of increasing retention time on the GC. For a few compounds (generally priority pollutants), the existence of standards and calibration curves, generated through previous USEPA contracts, has allowed for a semi-quantitative concentration to be presented. This concentration data is presented for informational purposes. Such data was not a contractual requirement and the detection limit criteria are

those of USEPA and not of USATHAMA. An indication of the concentration range of the other peaks identified is also given in the data tables. These concentration estimates were calculated assuming that the compound observed gives a response equivalent to that of the internal standard, i.e., that the response factor is 1.0. A more quantitative value cannot be reported unless standards of each compound are obtained and run on the system.

### QUALITY ASSURANCE/QUALITY CONTROL

## Introduction

The quality assurance measures employed for the BAAP survey were drawn directly from the "Quality Assurance Program for the U.S. Army Toxic and Hazardous Materials Agency", (May 1979). Some of the required quality control information was already available, having been collected in connection with work conducted for USATHAMA during the Milan Army Ammunition Plant Contamination Survey. Some changes were incorporated into the program after consultation with USATHAMA and will be evident from the discussion which follows.

## Determination of Detection Limits

The method of Hubaux and Vos was employed in determining detection limits. Standards prepared from SARMS (Standard Analytical Reference Materials as defined in USATHAMA QA Program) or reagents traceable to SARMS, were used to cover the entire linear working range of the method. Response was plotted vs. target (true) values. In most cases, response was recorded in concentration units. The responses of check standards were plotted vs. target (true) concentration. Check standards were identical in composition to calibration standards, but were analyzed as unknowns after prior calibration.

All raw data on responses of standards vs. target (true) concentration, together with graphical representations of the Hubaux and Vos detection limits, are included in the quality assurance supplement. Tables 5-2 and 5-3 summarize the detection limits for waters and soils, respectively.

Where only detection limits were of interest, one analysis was made at each concentration level. If precision and accuracy as specified in the USATHAMA program were also of interest, four repetitive analyses were made at each concentration level. In general, the following concentration levels were chosen; blank, 0.5 D.L., D.L., 2 D.L., 5 D.L. and 10 D.L. It is important to note that D.L. refers to the required detection limit.

62

# TABLE 5-2

## SUMMARY OF DETECTION LIMITS IN DEIONIZED WATER

Pesticides (a)

Metals

Parameter	Concentration	Parameter	Concentration
chlordane	0.11 µg/1	antimony	5.5 µg/l
toxaphene	8.9 µg/1	arsenic	6.3 µg/1
α-BHC	0.17 µg/1	beryllium	47 µg/1
γ-BHC	0.028 µg/1	cadmium	1.2 µg/1
δ-BHC	0.026 µg/1	chromium	4.4 µg/1
β-внс	0.035 µg/l	copper	5.0 µg/1
heptachlor	0.12 µg/1	lead	1.7 µg/1
aldrin	0.033 µg/1	mercury	0.47 µg/1
DDE	0.11 µg/1	nickel	8.1 µg/1
DDD	0.063 µg/l	selenium	2.0 µg/1
DDT	0.092 µg/1	thallium	2.9 µg/1
endrin	0.030 µg/l	silver	2.5 µg/1
dieldrin	0.16 µg/1	zinc	15 µg/1
endosulfan I	0.025 µg/1	tin	17.5 µg/1
endosulfan II	0.064 µg/l		

# PCB's (a)

# Other Compounds of Interest

Parameter	Concentration	Parameter	Concentration
Arochlor 1016 Arochlor 1221 Arochlor 1232 Arochlor 1242 Arochlor 1254 Arochlor 1248 Arochlor 1260	<pre>1.1 μg/1 3.0 μg/1 2.4 μg/1 1.3 μg/1 2.4 μg/1 0.70 μg/1 2.3 μg/1</pre>	nitrocellulose nitroglycerin 2,4-DNT nitrate nitrite sulfate DBP DPA benzene ethyl acetate chloroform	2.05 mg/l 11 $\mu$ g/l (a) 0.13 $\mu$ g/l (c) & (a) 0.36 mg/l 0.25 mg/l 5.7 mg/l 2.34 $\mu$ g/l (b) 2.34 $\mu$ g/l (a) 2.35 $\mu$ g/l (a) 7.06 $\mu$ g/l (a) 9.5 $\mu$ g/l (a) 2.28 $\mu$ g/l (a) 2.28 $\mu$ g/l (a)
		carbon tetrachloride	0.26 µg/1 <sup>(a)</sup>

(a) Detection limits determined by gas chromatography

(b) Detection limits determined by GC/MS

(c) From Nilan AAP program

# TABLE 5-3

## SUMMARY OF DETECTION LIMITS IN SOIL

Parameter	<u>Concentration</u>
2,4-DNT	8.86 ng/g
nitrate	0.83 µg/g
nitrite	0.63 µg/g
sulfate	9.92 µg∕g
DBP	2.8 µg∕g
DEP	3.6 µg∕g

As indicated in Tables 5-2 and 5-3, the detection limits for most organic parameters were in the low ppb range for waters and the low ppm range for soils. Nitrocellulose was an exception, showing a detection limit in the ppm range for waters. As indicated in the tables, the detection limits for inorganic parameters were in the low ppb range for metals in water, while for anions the detection limits were in the low ppm range on both waters and soils.

In all cases, the detection limits were found to be low enough to meet the requirements of the project and to allow for measurements which adequately defined the extent of pollution.

## Precision and Accuracy

Precision and accuracy data were also generated according to the USATHAMA procedure by repetitive analysis of standards at several levels of concentration as described above. These standards were added to blank water (i.e. deionized, organic-free water) or blank soil according to the type of precision and accuracy data sought. The "blank" soil was prepared by soxhlet extracting a low background soil with methylene chloride for 24 hours and air-drying. Analyses were performed by the same procedures used for samples.

The precision and accuracy data have been used to calculate two values based on a Hubaux and Vos plot of the data. Statistical calculations described below were facilitated by a program written for the computer. Accuracy is characterized by the slope of the regression line when plotting found values vs. target (true) values. When these slope values have been available, data have been corrected by dividing found values by the slope. Precision is characterized by means of the standard deviation (obtained by taking the square root of the variance as it appears on the Hubaux and Vos plot). For individual data values, these standard deviations are used to calculate relative standard deviations (equal to standard deviation divided by found value and multiplied by 100). Accuracy and precision for individual parameters are summarized in Table 5-4. Precision and accuracy data for parameters not included on this table was not requested by USATHAMA.

## Additional Quality Control

In addition to the determination of detection limits and the measurement of precision and accuracy as specified by USATHAMA, other quality control measures were employed. These included the analysis of duplicates and spikes as a control on samples analyses. These results are summarized in Tables 5-5, 5-6 and 5-7.

# TABLE 5-4

1

# PRECISION AND ACCURACY IN WATER AND SOIL

Parameter	Accuracy (Slope of Hubaux and Vos Regression Line Plot)	Precision (Standard Deviation of Hubaux and Vos Regression Line Plot)
Water:	Regression time riter	Regression line Flot,
lead	1.04	.82
tin	1.18	8.95
nitrocellulose	0.997	0.365
nitroglycerin	0.550	1.31
2,4-DNT	1.01	0.182
nitrate	1.64	0.196
nitrite	1.06	0.130
sulfate	0.705	1.71
DBP	0.457	0.0539
DPA	0.807	0.340
chloroform	0.972	0.299
carbon tetrachloride	1.00	1.37
mercury	0.9854	0.0860
Soil:		
2.4-DNT	0 576	2 46

2,4-DNT	0.576	2.46
nitrate	0.934	0.299
nitrite	0.088	2.03
sulfate	0.988	3.69

# TABLE 5-5 RESULTS OF DUPLICATE ANAYSES - METALS

.

.

Parameter	Site No.	Sample No.	Analysis No. 1	Analysis No. 2
aluminum	\$1102	A001	2.52 mg/l	2.70 mg/1 - water
aluminum	S1409	05009	6,500 µg/g	6,880 ug/g - seil
aluminum	S1414	D5014	6,700 µg/g	5,750 ug/g - water
aluminum	51122	A0011	0.23 mg/l	0.20 mg/1 _ Asil
antimony	\$1133	A0061	<5.5 µg/1	<5.5 µg/1
arsenic	S1133	A0061	<1 µg/1	1 115/1
beryllium	<b>S1133</b>	V0061	<l 1<="" td="" µg=""><td><l 1<="" td="" µg=""></l></td></l>	<l 1<="" td="" µg=""></l>
cadmium	\$1133	A0061	<5 µg/1	<5 µq/1
chromium	S1133	A0061	84 µg/1	60 µg/1
chromium	\$1133	A0061	5.9 µg/1	6.0 µg/1
copper	S1133	A0061	25 µg/1	27 µg/1
iron	S1121	A0056	0.43 mg/1	0.54 mg/1
lead	51414	D5014	1.64 µg/g	1.59 µg/g
lead	S1409	D5009	83.0 µg/g	85.5 µg/g
lead	51102	A0001	10.4 µg/1	10.6 µg/1
lead	S1122	A0011	2.83 µg/l	3.67 µg/l
lead	S1133	A0061	10.2 µg/1	12.9 µg/1
mercury	\$1123	A0052	<0.3 µg/1	<0.3 µg/1
nickel	<b>S1133</b>	A0061	<5 µg/1	<5 µg/1
selenium	S1133	A0061	<2 µg/l	<2 µg/1
silver	S1133	A0061	<3 µg/l	<3 µg/1
tin	S1414	D5014	0.35 µg/g	0.60 µg/g
tin	51122	A0011	<1 µg/l	7 µg/1
tin	S1409	D5009	2,5 µg/g	1.8 µg/g
tin	<b>S11</b> 07	A0063	7.7 µg/1	1.4 µg/1
tin	\$1102	A0001	6.8 µg/l	<1 µg/1
thallium	<b>S113</b> 3	A0061	<l l<="" td="" µg=""><td>&lt;1 Hg/1</td></l>	<1 Hg/1
zinc	<b>S11</b> 33	A0061	99 µg/l	93 Lg/1
zinc	S1121	A0056	<10 µg/l	<10 µg/1

NOTE: The following samples which are not from BAAP were run as duplicates in sets containing BAAP samples:

mercury	29507	<0.3 µg/l	<0.3 µa/1
mercury	29507	0.4 µg/l	<0.3 µg/1
mercury	29237	<0.3 µg/1	<0.3 µg/1

Tin (Sin) Elsudas Minnespha duinting water qui delines: 4.2 mg/2 (4,200 ug/C)+ 4.0 mg/2 (4,000 ug/C)

P.44 map

67

## TABLE 5-6

RESULTS OF DUPLICATE ANALYSES - ORGANICS AND NON-METALS

Parameter	Site No.	Sample No.	Analysis No.1	Analysis No. 2
COD	51311	D5064	70,500 mg/kg	56,500 mg/kg
COD	51301	D5035	43,700 mg/kg	43,700 mg/kg
COD	51123	A0052	2 mg/l	4 mg/l
ammonia	51113	D5065	172 mg/kg	150 mg/kg
ammonia	51303	D5041	348 mg/kg	310 mg/kg
nitrite	51108	A0064	0.376 mg/1	0.374 mg/l
nitrate	51321		0.73 mg/l	0.73 mg/1
kjeldahl-N	51123	A0052	<0.5 mg/l	<0.5 mg/l
percent solids	51305	M0012	6.53%	6.64%
<b>al</b> kalinity	51136 (DNR 3)	A0072	335 mg/l	337 mg/l
sulfate	51132	A0058	3 mg/l	2.4 mg/1
carbon tetrachloride	51117	A0050	64 µg/l	68 µg/l
chloroform	51117	A0050	12 µg/l	13 µg/1
2,4-DNT	51202	D5020	403 mg/1	381 mg/1
nitrocellulose	51321		0.002 mg/l as	$NO_{\overline{2}}$ 0.043 mg/l as $NO_{\overline{2}}$

NOTE: The following samples which are not from BAAP were run as duplicates in sets containing BAAP samples:

COD	29052	51 mg/1	23 mg/l
COD	28463	19 mg/1	20 mg/l
alkalinity	28389	370 mg/1	368 mg/l

	£ 5−7	TABI			
ANALYSES (a)	SAMPLE	SPIKED	OF	RESULTS	

Parameter	Site No.	Sample No.	Conc. Sample	Value of Spike	Calc'd Sample and Spike	Found Sample and Spike	Percent Recovery
antimony	S1107	A0063	<3 µg/l	15 μg/l	16 <b>.</b> 5 μg/l	13.08 µg/l	77%
lead	S1133	A0061	12.9 μg/l	7.5 µg/l	20.4 µg/l	20.5 μg/l	101%
lead	S1133	A0061	12.9 μg/l	15 µg/l	27.9 μg/l	31.9 µg/l	127%
nickel	S1133	A0061	<5 µg/l	20 µg/l	22.5 µg/l	18.6 µg/l	81%
nickel	S1108	A0064	<5 μg/1	20 µg/l	22.5 µg/l	21.4 µg/l	95%
thallium	S1133	A0061	<l l<="" td="" µg=""><td>5 μg/l</td><td>5.5 µg/l</td><td>3.28 μg/l</td><td>56%</td></l>	5 μg/l	5.5 µg/l	3.28 μg/l	56%
thallium	S1133	A0061	<1 µg/1	10 µg/l	10.5 µg/l	8.12 µg/l	76%
zinc	S1136 (DNR <b>3)</b>	A0072	202 g/l	1,000 g/l	1,202 g/l	1,100 g/l	90%

NOTE: (a) For the purpose of calculating recoveries, values less than the detection limit were taken to be one-half the detection limit (i.e., for nickel <5 µg/1, value taken as 2.5 µg/1).

69

## Discussion of Quality Assurance

The procedures used in conducting the quality assurance aspects of this project were based on the concepts and approach developed by USATHAMA. The results from analyses performed under the quality assurance program provide a basis for judging the overall data reliablity. In particular, one can be confident that the low levels of contaminants reported are reliable, due to the extensive preliminary QA work on detection levels.

It should be noted, however, that the detection levels determined by the Hubaux and Vos procedure are conservative estimates.

## CHAPTER 6

## GRUBERS GROVE BAY

An investigation of Grubers Grove Bay was conducted in conjunction with the overall study of potential groundwater and/or surface water contamination at BAAP. This investigation was initiated at the request of the Wisconsin DNR to determine whether the sediment in the bay should be removed. A previous investigation indicated that some of the sediment had originated from past manufacturing operations at BAAP. Removal of these contaminated sediments through dredging had been proposed, but questions arose concerning the benefits of dredging versus the detrimental impacts. Discussions among USATHAMA, BAAP, Wisconsin DNR and EEI personnel resulted in the implementation of the sampling and analysis program described in the following section. This program was designed to answer the questions:

- Are the sediments in Grubers Grove Bay contaminated with materials discharged during manufacturing operations at BAAP?
- 2) If the sediments are contaminated, what is the nature and extent of the contamination?
- 3) If the sediments are contaminated, are they having a measurable adverse impact on the aquatic ecosystem in the bay?
- 4) Would the sediments, if left in place, have any long term adverse effect on the environment?
- 5) Would dredging the sediments tend to release contaminants into the water that currently are trapped in the sediments?

This sampling and analysis program contained two main elements. Samples of water, sediment, and fish were collected and analyzed to document and quantify the extent of contamination, and to determine whether this contamination was being transferred up the food chain to fish species consumed by man. The second main element consisted of determining the ecological health of Grubers Bay by comparing the macroinvertebrate organisms in the bay sediments with those in an uncontaminated, but morphologically similar, bay in Lake Wisconsin - Wiegands Bay. The information from these two elements of the investigation were then used to assess the potential impacts of the proposed dredging.

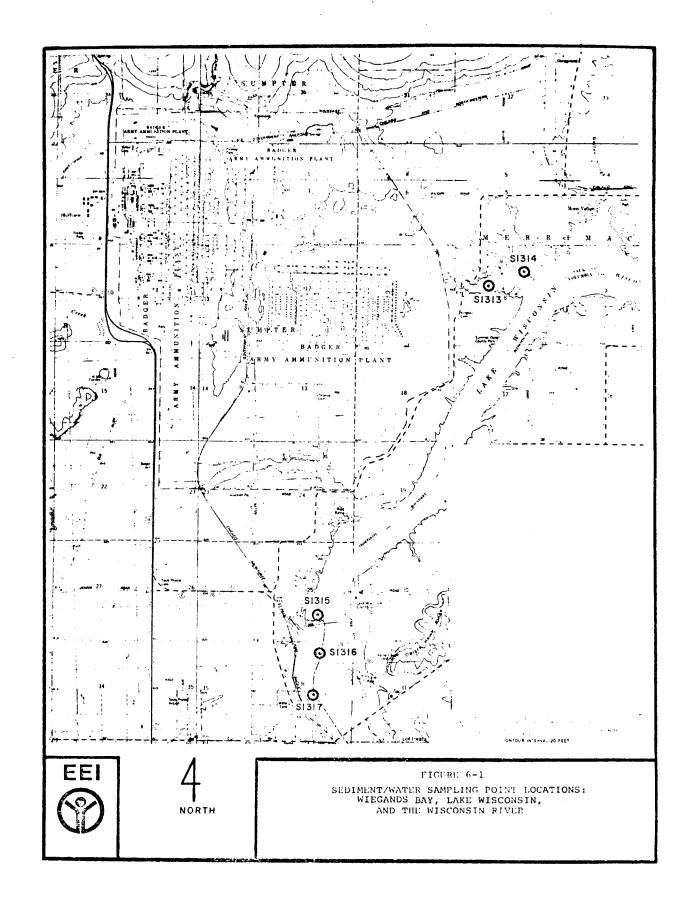
## WATER SAMPLING

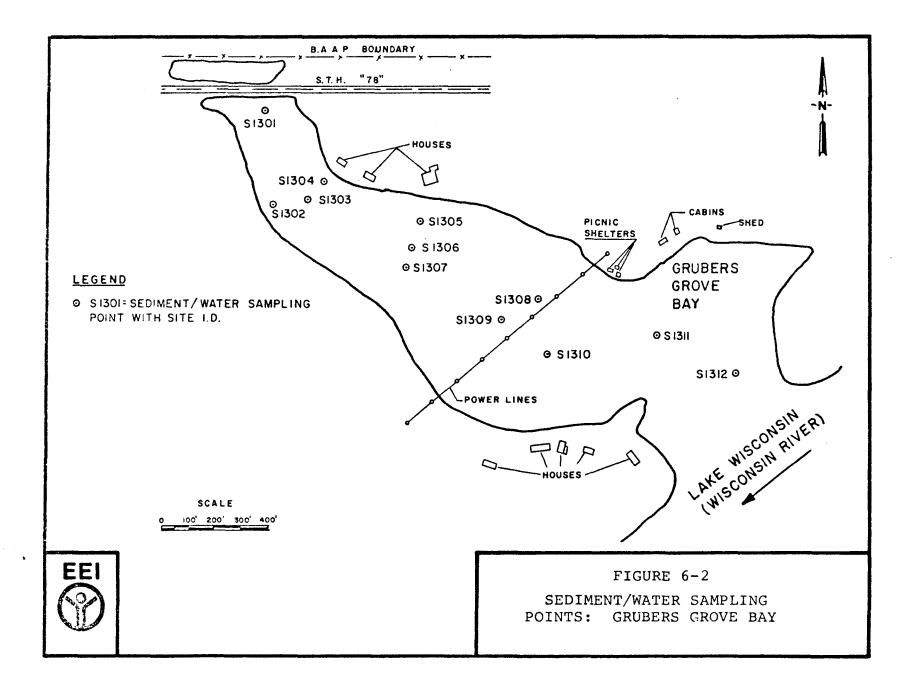
Seventeen locations were identified for the collection of both surface water and sediment samples. Twelve were in Grubers Grove Bay, two in Wiegands Bay, one in Lake Wisconsin just above the dam and two in the Wisconsin River below the dam (see Figures 6-1, 6-2 and 6-3). The first set of samples was collected by an EEI field sampling team during November, 1979, just before the ice formed on the bays. A second partial set of samples was collected through the ice in February, 1980.

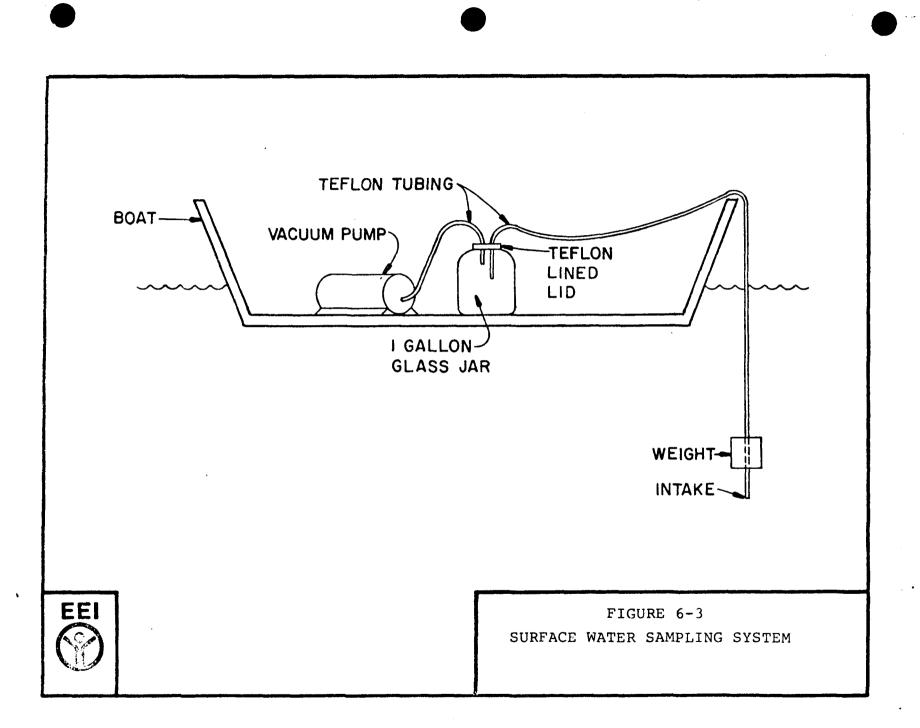
The first samples were collected from a small boat using the apparatus shown in Figure 6-3. This aspirator-type system allowed for the collection of the sample in a 1-gallon glass jar. The samples were depth integrated throughout the water column at each site. After a sufficient amount of sample had been collected, the sample was poured-off into different sample containers, e.g. amber glass quart jars, pint and quart plastic bottles, and 40 milliliter septum seal volatile organic analysis (VOA) vials. A different 1-gallon glass jar was used for each site. All glass containers had Teflon-lined lids, and were cleaned in EEI's laboratory according to USATHAMA procedures before shipment to BAAP.

The sampling apparatus that was used has a number of advantages and disadvantages. It is readily portable, easily cleaned, and capable of obtaining either vertically integrated samples or samples collected at a discreet depth. The sample contacts only Teflon and glass which minimizes the potential for cross contamination and sorption/desorption problems associated with other sampling systems. It is also capable of collecting the relatively large sample volumes required for the multiple analyses requested and can be used successfully in relatively rapidly flowing water. Its primary disadvantage is that the partial vacuum generated in the 1-gallon glass jar may tend to strip some of the volatiles from the water sample.

The water samples taken in February, 1980 were collected through the ice in Grubers Grove Bay. This partial set of samples (sites S1301, S1307 and S1312) was collected on a grab sample basis by holding the open containers under water and allowing them to fill.







#### SEDIMENT SAMPLING

Sediment samples were collected at each of the seventeen water sampling sites. The sediment samples at sites S1313 through S1317 were collected by EEI personnel from a small boat in November, 1979, at the same time the first set of water samples was collected. These samples were collected by using a standard Ekman dredge (see Figure 6-4). After each retrieval of the sampler, the sample was emptied into a stainless steel mixing bowl at each site until a sufficient quantity of sample had been collected. The sample was blended in the field and placed into amber quart jars with Teflon lid liners. The jars had been pre-cleaned according to USATHAMA sample container cleaning procedures.

The Ekman sampler was cleaned with lake water at each site after the water sample had been collected and before collecting the sediment sample.

The sediment samples at sites S1301-S1312 were collected in February, 1980 by Warzyn Engineering, Inc. personnel under EEI supervision. The samples were collected through the ice with the aid of a drilling rig. The samples were collected in 2-foot thick increments to a variable depth (depth depended on the thickness of the sediments). The entire thickness of sediments was sampled at each location and one 2-foot sample was taken of the underlying granular soils (Table 6-1). The sediments were easily distinguished from the soils by color, texture and odor. Sediments were a black organic silt or muck, and the soils were a brown sand or silty sand. The original topsoil was distinguishable at some locations (silty sand, with some humus and roots).

The samples were collected using 3-inch diameter shelby tubes through use of an osterberg piston sampler (Figure 6-5). Each of the shelby tube samples was emptied into a porcelain-lined mixing bowl and blended in the field before placing the sample into several (three to five) amber glass wide-mouth quart jars. These jars had Teflon lid liners. The number of jars per sample varied depending on the amount of sample recovered. The mixing bowl and stainless steel mixing spoon were washed with snow and water from the bay between each retrieval of the sampler.

The sample jars were kept cold (less than 40°F) and dark until packed for shipment via air freight to EEI's laboratory. The samples were packed in Coleman coolers and iced for shipment.

## EKMAN DREDGE (Bottom Sampler)

Various sizes of Ekman Dredges are available for taking samples of mud from the bottoms of water bodies. The sampling dredge is lowered to the bottom with the jaws in open position. A release mechanism is lowered down the support line to close the jaws. The jaws are spring mounted, causing them to bite into the mud to obtain a sample. This type of sampler can only be operated in soft material. It is usually used in taking mud samples for quantitative studies of lake muds, vegetable debris and bottom fauna. Ekman dredges are solid brass construc-

tion with stainless steel springs and cables. Both models include a marine plywood carrying case with a polyurethane finish. Available in 2 sizes: Model Description Shipping Wt. DR-1007 6" x 6" sq. (152 mm x 152 mm sq.) Ekman Dredge 15 lbs. (7 kg.) Chamber Volume: 216 cu. in. (3,540 cu. cm)

DR-1008 9" x 9" sq. (229 mm x 229 mm sq.) Ekman Dredge 28 lbs. Chamber Volume: 729 cu. in. (11,950 cu. cm)

28 lbs. (13 kg.)

Model DR-1008 was used at BAAP

FIGURE 6-4 STANDARD EKMAN DREDGE

## TABLE 6-1 Sediment sample key

Sample Point	Depth Interval (feet)	EEI Lab Number	Sample Number	Composite Sample Numbers
S1301 S1301 S1301	0-2 2-4 4-8	26422 26423 26424	M0005 D5034 D5035	D5036C D5036C D5036C
S1302 S1302 S1302	0-2 2-4 4-6	26425 26426 26427	M0006 D5037 D5038	D5039C D5039C D5039C
S1303 S1303 S1303 S1303 S1303 S1303	0-2 2-4 4-6 6-8 9-10	26428 26429 26430 26515 26516	M0007 M0008 M0009 D5040 D5041	M0789C D5042C M0789C D5042C M0789C D5042C D5042C D5141 D5042C
S1304 S1304 S1304 S1304 S1304	0-2 2-4 4-6 6-8	26517 26518 26519 26520	M0010 M0011 D5043 D5044	M1011C D5045C M1011C D5045C D5045C D5045C
S1305 S1305 S1305	0-2 2-4 4-6	26521 26522 26523	M0012 D5046 D5047	D5048C D5048C D5048C
S1306 S1306 S1306 S1306 S1306	0-2 2-4 4-6 6-8	26524 26525 26526 26527	M0013 M0014 D5049 D5050	M1013C D5051C M1013C D5051C D5051C D5051C
S1307 S1307 S1307 S1307 S1307	0-2 2-4 4-6 6-8	26528 26529 26530 26531	M0015 M0016 D5052 D5053	D5054C D5054C D5054C D5054C
S1308 S1308	0-2 2-4	26543 26544	D5055 D5056	D5057C D5156 D5057C
S1309 S1309	0-2 2-4	26545 26546	D5058 D5059	D5060C D5060C
S1310 S1310	0-2 2-4	26547 26548	D5061 D5062	D5063C D5063C
S1311 S1311	0-2 2-4	26549 26550	D5064 D5065	D5066C D5066C
S1312 S1312	0-2 2-4	26551 26552	D5067 D5068	D5069C D5069C
S1313	0-1		M0018	
S1314	0-1	26792	M0017	
S1315	0-1			
S1316	0-1	Not Analyzed		
S1317	0-1			



## Osterberg Piston Sampler, new model

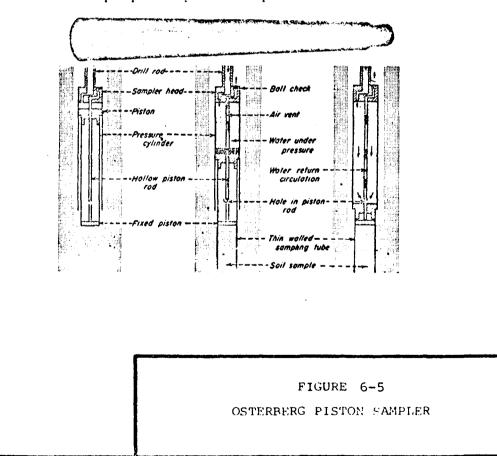
The new, streamlined design Osterberg Sampler has been found to be unusually successful in obtaining full recovery on samples of both sands and clays. A major advantage of this sampler over the usual fixed piston type is that only one string of rods is needed to operate it. In addition, the pushing is done hydraulically and it is impossible to overdrive.

How it Operates:

The sampler is lowered into a previously drilled and cleaned-out hole. When water pressure is applied through the drill rod, a piston to which a thin walled sampling tube is attached is forced out of the pressure cylinder. A second piston — the fixed piston inside the sampling tube — is connected to the sampler head by a hollow rod. As the piston is forced down in the pressure cylinder, air in the sample tube escapes through the hollow rod and ball check. The reaction for the pushing is obtained by clamping the drill rod either to the casing or to the drill rig.

The reaction for the pushing is obtained by clamping the drill rod either to the casing or to the drill rig. When the piston has reached its full stroke and the sampling tube penetrated its full depth in the soil, water pressure is automatically relieved by allowing circulation through a hole in the hollow piston rod and through ball check. The sampler is then turned 1/2 revolutions (the inside tube being held to the outside tube by means of a friction clutch) to break off the soil at the bottom of the tube. The sampler is then ready for removal from the drill hole.

The sampler is furnished complete with one sample tube and a kit of spare parts. Sampler tubes are polished inside.



Appendix E includes boring logs of the sampling operations. These logs were used to generate the contours shown in Figure 6-6. Because the sediments were very soft, it was not necessary to maintain an open hole to take deeper samples. The osterberg sampler was merely forced into the sediment to the desired depth in the closed position. Once the desired depth was reached, the sampler was activated and then retrieved. This method worked extremely well until sandy subsoil was encountered at each sampling site. The sand provided a much greater resistance to the operation of the sampler, and sampler penetration into this unit was sometimes poor (5 to 20 centimeters).

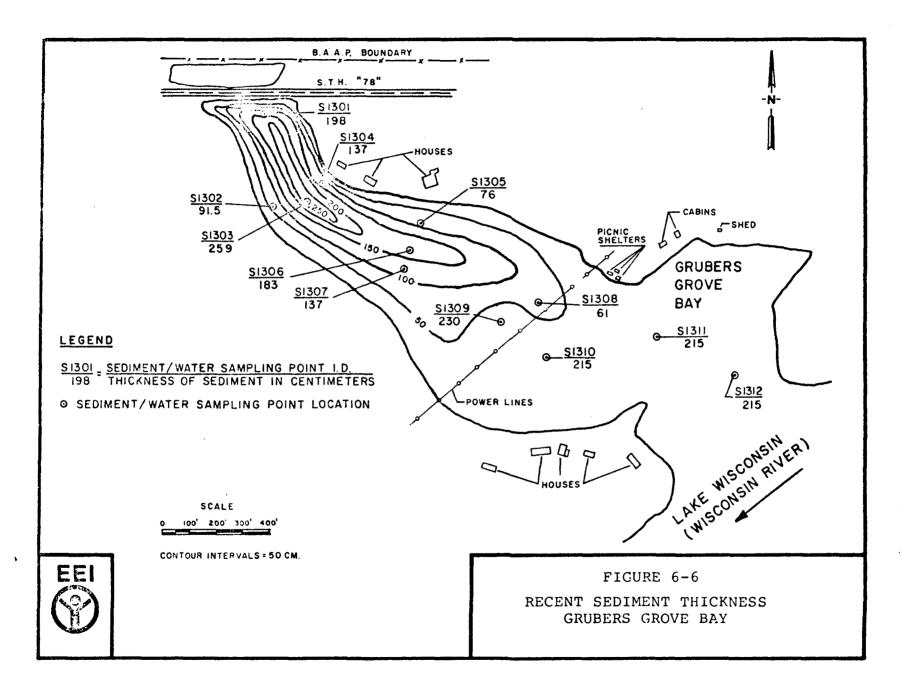
#### FISH SAMPLING

Ten species of fish were collected from Grubers Grove Bay (Table 6-2) including the sport and rough fish most commonly sought by anglers and commercial fishermen. A total of 13 "net days" (net set in place for 24 hours = 1 net day) were required to obtain the desired variety of species from Grubers Grove Bay. Wiegands Bay yielded ten of the desired species in 8 net days (Table 6-2). Fish collections were also made in Lake Wisconsin proper by the Wisconsin Department of Natural Resources. This sampling produced carp, channel catfish and sturgeon which were all found to be over 5 years old and contained large deposits of fatty tissues.

Samples selected for analysis included composites of predatorsport fish, pan fish and rough fish from both Grubers Grove and Wiegands Bay. A large carp and lake sturgeon were selected for analysis from Lake Wisconsin.

The area and depth of the surface waters to be sampled allowed for the use of gill nets as collecting devices. The nets were 100 feet long with panels 4 feet by 25 feet. Mesh sizes were 3/8-inch, 1-inch, 1-1/2 inch and 2-1/2 inch, composed of either multifilament or monofilament twins.

The nets were set parallel to prevailing winds with a 25 pound anchor on the windward end. This technique allowed the net to be cleaned and replaced without lifting both anchors. Black and white striped buoys marked both ends of the nets along with triangular white flags containing collectors' permit numbers. The small variable sized mesh produced fewer fish of large size. The fish that remained alive in the net which were not needed for analysis were released unharmed. Others were field dressed and returned to the local Department of Conservation agent in Sauk City.



## TABLE 6-2 FISH COLLECTION

ŧ

1

Sample Number	Common Name	Genus Species	Age (years)
Grubers G	rove Bay		
B0201 B0202 B0211 B0212	Sauger	Stizostedion canadense	2.5 2.5 2.5 2.5
B0203 B0214 B0214 B0216	Carp	<u>Cyprinus carpio</u>	2.5 2.5 5.5 5.5
B0204 B0219	Redear sunfish	Lepomis microlophus	1.5 1.5
B0205 B0206	Yellow perch	Perca flavescens	2.5 2.5
B0207 B0222 B0233	White bass	Morone chrysops	0.8 0.8
B0208 B0209	Northern pike	Esox lucius	3.5 3.5
B0210 B0218	Walleye	Stizostedion vitreum	2.5 2.5
B0213 B0220 B0227 B0228	Brown bullhead	<u>Ictalurus</u> <u>nebulosus</u>	1.5 1.5 1.5 1.5
B0223	White sucker	Catostomus commersoni	3.5
B0221	White crappie	Poxomis annularis	0.8
B0226	Rock bass	Ambloplites rupestris	2.5
Wiegands	Bay		
B0235 B0236 B0237	Sauger	Stizostedion canadense	1.5 1.5 1.5
B0240 B0241	Carp	Cyprinus carpio	<b>5.5</b> 4.5
B0229 B0248	Yellow perch	Perca flavescens	2.5 2.5
B0232 B0233	White Bass	Morone chrysops	3.0 1.0
B0238 B0239	Northern pike	Fsox lucius	1.5 2.5
B0245 B0246 B0234	Walleye	Stizostedion vitreum	2.5 1.5 4.5
B0231 B0247	White cruppie	Poxomis annularis	0.8 1.5
B0230	Black crappie	Poxomis nigromaculatus	1.5
B0242	Channel catfish	Ictalurus punctatus	9.0
Wisconsin	River		
B0217 B0225	Lake sturgeon	Acipenser fulvescens	10.0 14.0
80224	Channel catfish	Ictalurus punctatus	11.0
B0243 B0244	Carp	Cyperanus carpio	10.5

Fish that were retained for analysis were placed on ice and taken to the BAAP for cleaning. The fish were identified, weighed, measured and logged with sample numbers. The skinless lateral line and stomach tissues were removed and placed in clean quart amber bottles and immediately frozen. Fish were transported frozen to the EEI laboratory for analysis.

Scales were removed for age determination from those fish taken for tissue analysis. The scales were prepared in glycerin and annuli were counted under a dissecting microscope to determine the number of years of growth.

Pectoral spines were taken from catfish and pectoral fin rays were removed from lake sturgeon also for the purpose of aging. These were sectioned with a jewelers saw and growth rings were counted to determine the years of growth.

## CHEMICAL ANALYSIS

The number of samples and the types of analyses performed on them for each category of sample (water, sediment and fish) are shown in Table 6-3. The samples were analyzed according to the same methods and procedures described in Chapter 5. The QA/QC procedures described in Chapter 5 were also applied to these samples. The analytical results for these samples are included in Appendix I by both site ID and test name.

## DATA INTERPRETATION

#### Screening Phase

Grubers Grove Bay was the initial receiving body for all industrial wastewater discharges from BAAP. The GC/MS analyses performed on the water and sediment samples from Grubers Grove Bay (sites S1301-S1312) and from Wiegands Bay (S1314) were conducted during the screening phase of this investigation. A summary of the results of these analyses is shown in Table 6-4. Several other parameters (Al, Nc, NO<sub>2</sub>, NO<sub>3</sub>, Pb, Sn, and SO<sub>4</sub>) were also checked as part of the screening phase.

The GC/MS analyses were performed in order to determine the presence of any organic contaminants which may have originated from operations at BAAP. The results of these analyses are included in Appendix I. Those compounds identified in the samples which EEI believes may have originated from BAAP manufacturing operations are shown in Table 6-4.

## TABLE 6-3 ANALYSES PERFORMED ON SEDIMENT

Number of Samples Analyzed For: Sample Type Al CEC COD NC NO<sub>3</sub> NO<sub>2</sub> Pb pH NH<sub>3</sub> <u>Sn</u> <u>SO4</u> GC/MS Water NA Sediment Fish 

NOTES: NA - Not an appropriate test

## TABLE 6-4

SUMMARY OF POSITIVE GC/MS RESULTS: GRUBERS GROVE BAY AND WIEGANDS BAY<sup>(a)</sup>

Site ID	Sample Number	DEP <sup>(b)</sup>	DBP(b)	DPA <sup>(b)</sup>	S/W/F <sup>(b)</sup>
S1301	D5036C	0.31	3.1	3.1	S
S1307	D5054C	0.23	17	24	S
SJ.312	D5069C	140	0.61	91	S
S1314	M0017	1.4	0.23		S
S1301	W0016	6	3		W
S1307	W0017	2	1		W
S1312	W0018	1	<1		W
S1314	W0019	<1	<1		W
B0210/B021	8 (Walleye)	0.02	0.1		F
B0216 (Car	p ,	0.03	0.1		F
B205/B0206	(Perch)	0.02	0.1		F

NOTES:

(a) All results reported as either  $\mu g/g$  or  $\mu g/l$  for solids and water, respectively.

(b) DEP = Diethylphthalate DBP = Dibutylphthalate DPA = Diphenylamine S/W/F = Sediment/Water/Fish The sediment sample from site S1312 had higher concentrations of diethylpthalate (DEP) and diphenylamine (DPA) than that found in the background sediment sample from Wiegands Bay (site S1314). Site S1312 is at the mouth of Grubers Grove Bay, and the sediment there may be strongly influenced by Lake Wisconsin. Although DEP and DPA are used at BAAP, they are commonly used in many industrial operations and they are probably not unique to BAAP. Therefore, their presence in the sediment at site S1312 is not necessarily due to the operations at BAAP.

The sediment sample at site S1307 (near the middle of Grubers Grove Bay) had a higher concentration of di-n-butylpthalate (DBP - another commonly used industrial chemical) than that found in the background sample (site S1314 - Wiegands Bay). Since BAAP is the only industrial operation draining into this bay, the DBP in the sediment at this site probably originated in the manufacturing operations at BAAP. However, the concentration of DBP in this sample (at site S1307) is so low that it does not constitute a threat to man or the environment.

The three water samples collected from Grubers Grove Bay also contained slightly elevated concentrations of DBP and DEP, but still at the "trace" level and of no great concern. None of the other suspected organic contaminants (such as 2, 4-DNT) were detected in either the sediment or water samples from Grubers Grove Bay.

Nitrocellulose (Nc) was manufactured at BAAP in large quantites and is not a common industrial compound. Though explosively combustible when completely dehydrated, it is highly hygroscopic and will readily absorb enough moisture from the air to render it inexplosive. It is very insoluble in water. It is not considered toxic; however, it will slowly decompose in the environment under anaerobic conditions to form ammonia.

With these properties, Nc was considered a good indicator for contaminated sediment. It was found in high concentrations in two of the three sediment samples from Grubers Grove Bay that were analyzed for it as part of the screening phase of this study (see Table 6-5). Because it was found in such high concentrations, it was decided to test the sediments for ammonia (one of the degradation products) and chemical oxygen demand (COD) during the verification phase. It was also decided that, since the sediments were contaminated, three of the fish samples should be given a general screening for organics via GC/MS.

SUMMARY OF POSITIVE ANALYTICAL RESULTS BY SITE ID	en e
	R
S1300 SERIES : SOIL/SEDIMENT	
Sample Depth NC Pb $HN_3N_2$ Site ID Number (cm) (%) (µg/g) $(\mu g/g)$	2
S1301 D5036C 0 4 10 70	
S1303 M00076 O NA NA 2000	
S1305 M0012 O NA NA 3000	

NA

NA

NA

NA 17

NA

NA

0

0

0

0

61

183

183

300 NA

NA

NA

90

NA

NA

Ц.

NA 600 3000

1000 1000

1000 600

3000-2

ΰ

45

NOTES: NA = Not Analyzed

S1306

S1307

s1310

.

D5051C D5050 M0013C

D5053 D5054C

D5061 D5062

Û

87

Sediment sample D5051C from site S1306 (middle of Grubers Grove Bay - see Figure 6-2) contained a slightly elevated concentration of lead (300ug/g). According to the manual Quality Criteria for Water (USEPA - July, 1976) "the usual range of lead-in-soil concentrations is 2-200 ppm." If it is assumed that this range is also typical for lake sediments, then the lead content of sample D5051C indicates some degree of contamination. However, since none of the other 13 sediment samples tested for lead had high concentrations, any lead contamination present in the sediments is not very extensive.

## Verification Phase

The results of the COD and ammonia analyses of the sediment samples are included in Appendix I. As summarized in Table 6-3, high concentrations of ammonia were found in many of the sediment samples in Grubers Grove Bay. Though the COD content of the samples was also very high, it was not significantly higher than that of the two control samples from Wiegands Bay (S1313 and S1314).

The high COD and ammonia concentrations in the sediments indicate that nitrocellulose contamination is extensive throughout most of the bay. It is also apparent that the Nc is decomposing and releasing ammonia.

The results of the GC/MS analyses performed on the three fish samples are included in Appendix I, and summarized in Table 6-4. As shown in this table, DEP and DBP were detected in the fish, but not at concentrations significantly above the blank analysis. None of the other suspected contaminants from BAAP operations (e.g. 2, 4-DNT) were detected. Though there is no reason to believe they originated from BAAP, several other contaminants of environmental and human health concern were detected in the fish samples. These contaminants are also listed in Table 6-4.

#### MACROINVERTEBRATE STUDY

EEI surveyed benthic macroinvertebrates in two bays of Lake Wisconsin in order to assess the differences, if any, between them. The study was designed as a single phase investigation that could provide qualitative data on gross community differences. The study included determination of the optimum number of sampling points, location of points, collection of organisms and relevant field data, and analysis of information. The single phase (one-time collection) nature of this investigation precluded any in-depth analysis of the biological community structure; the limited data have therefore been interpreted on the basis of prior experience with similar ecosystems.

## Materials and Methods

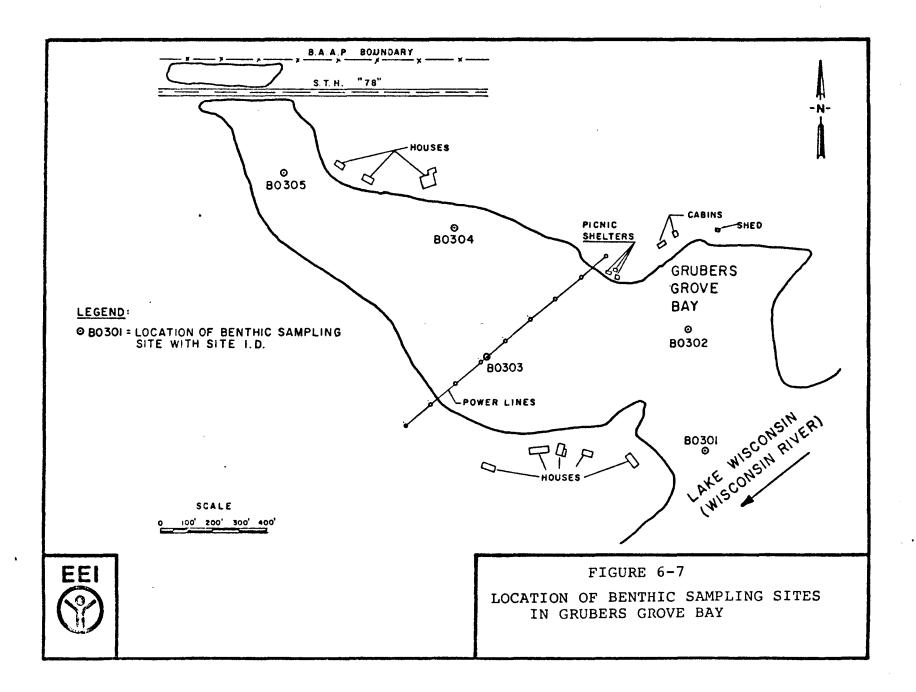
Benthic macroinvertebrates were collected at five sampling stations in each of both Grubers Grove Bay and Wiegands Bay (see Figures 6-7 and 6-8). The stations in Grubers Grove Bay were chosen by a stratified random method that was designed to provide information on the variations in physical habitats from the mouth of the bay to its back. The sampling stations in Wiegands Bay were selected in a similar manner and were paired with the stations in Grubers Grove Bay. The a priori selection of stations in Wiegands Bay proved to be satisfactory to the extent that the pooled data for each bay could be analyzed on a comparative basis.

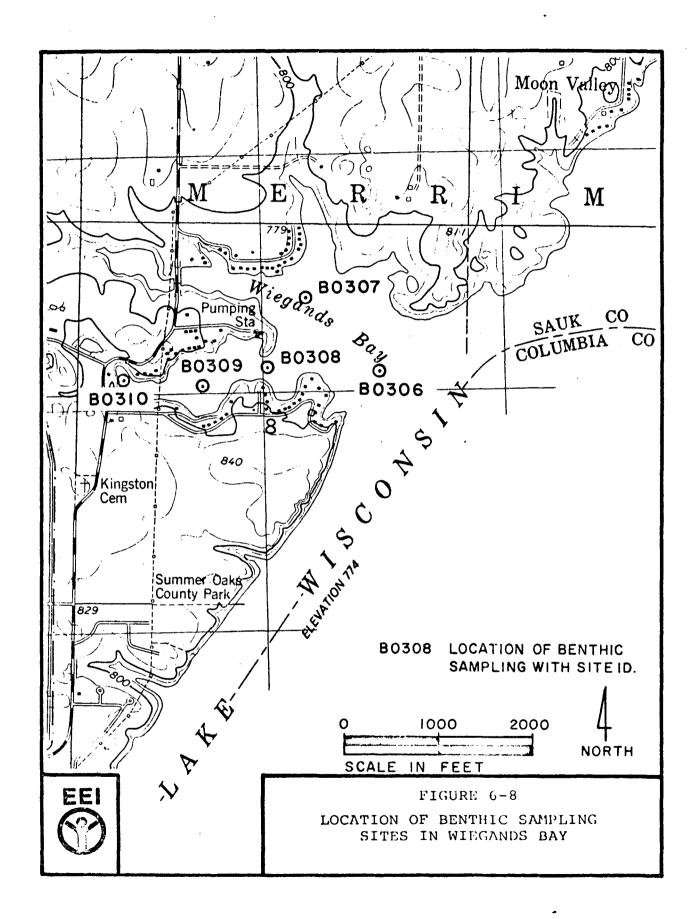
Benthic grab samples were taken with a tall version of the standard Ekman bottom sampler. The tall version was used because of the extremely soft sediments encountered. Five grab samples were composited at each sampling station. Material was removed from the Ekman sampler and washed in the field through a standard No. 30 sieve bucket. The material that was retained by the sieve was placed into one-half gallon jars and preserved with either 70 percent ethyl alcohol or 5 percent formalin depending on the amount of organic debris in the sample.

Depth of water, temperature of the water at the bottom, the dissolved oxygen at the bottom and secchi disc depth were also measured at each sampling station before taking bottom samples (Table 6-6).

Benthic samples were sorted to remove all organisms. The actual time required to sort each sample varied directly with the amount of debris; the time spent varied from 30 minutes to over 3 hours for individual samples. Organisms were transferred to 70 percent ethyl alcohol for storage. Identification of organisms was aided by the use of both dissecting and light transmittance microscopy. Larvae of the chironomidae were cleared by heating in a 5 percent solution of potassium hydroxide prior to mounting on microscope slides in glycerin jelly. All organisms were identified to the lowest possible taxonomic level for which reliable identification characters have been established.

Zooplankton and phytoplankton samples were also collected at six of the sampling stations (see Table 6-7). Zooplankton was concentrated from 45 liters of surface water by using a Wisconsin-style plankton net with detachable plankton bucket.





## TABLE 6-6

## FIELD DATA FROM BIOLOGICAL COLLECTION (NOVEMBER 5-7, 1979)

Sample Station	Depth ( <u>meters</u> )	Dissolved Oxygen(a) _(mg/l)	Temperat Surface-		Secchi Disc Depth(cm)	Water Volume for Zooplank- ton(liters)	Water Volume for Phyto- plankton(l <b>iters)</b>
B0301	6.1	10.4	8	7	120	45	3
B0302	4.0	10.6	ND(b)	7	100	NS <sup>(C)</sup>	NS
B0303	3.7	11.4	8	7	105	45	3
B0304	2.1	10.6	ND	7	105	NS	NS
B0305	0.8	11.4	ND	6	80	45	3
B0306	6.7	10.5	7	6	100	45	3
B0307	4.3	11.0	ND	6	120	NS	NS
B0308	5.5	11.5	8	6	130	45	3
B0309	4.6	11.2	ND	6.5	130	NS	NS
B0310	1.8	11.8	7	7	130	45	3

## NOTES:

4

(a) measured approximately 0.1 meters from bottom

(b)<sub>ND</sub> = No data

(C)<sub>NS = No sample</sub>

#### TABLE 6-7

.

#### BENTHIC MACROINVERTEBRATE ORGANISMS COLLECTED AT TEN SAMPLING POINTS IN LAKE WISCONSIN

.

	Grubers Grove Bay			Wiegands Bay						
	B0301	B0302	B0303	B0304	B0305	B0306	B0307	B0308	B0309	B0310
Oligochaeta Lumbriculidae <u>Peloscolex</u> Limnodrilus <u>Tlyodrilus</u> Tubifex tubifex	181 138	9 164 43 9	9 60	34	60 43	9 43	26 43	9	9	215 9
Gastropoda Lymnaea Physa Valvata	26	17			9	9	9			17
Pelecypoda Sphaerium	17			9		17	43			
Crustacea <u>Asellus occidentalis</u> <u>Hyalella</u> azteca			9			9				
Ephemeroptera Hexagenia rigida	34	9	9			26	77			
Odonata Tetragoneuria				9	9					
Hemiptera Corixidae (imm.)						9				
Megaloptera <u>Sialis</u>	17	26	5 <b>2</b>				17		9	
Trichoptera Oecetis eddlestoni										9
Diptera Chaoborus Palpomyia Procladius Coelotanypus Prodiamesa	146 103 370 9	86 189 577	60 112 258 9	86 34 112 86	112 172 69 52	9 34 189 77 9	34 95 215	34 77 17	723 26	52 9 34
Pseudosmittia Chironomus Cryptochironomus	9	95 9	26 9	9	77 17	706	43	26	9	9 9
Number of Taxa	11	12	11	8	10	13	10	5	5	9
Total Organisms/m <sup>2</sup>	1,050	1,233	613	379	620	1,146	602	163	776	363
Diversity Index (decits) H'	.81	.73	.77	.75	.87	.60	.85	. 59	.14	.61

NOTE: Density of each organism at each station is given as the number of organisms per square meter  $(m^2)$  of bottom area.

.

.

Zooplankton samples were preserved and stored for future analysis. Phytoplankton was collected just below the water surface, preserved with Lugol's solution, and concentrated by settling in accordance with USEPA guidelines (1). These samples were also stored for future analysis. Surface water temperature was recorded at the sampling stations where plankton was collected (Table 6-6).

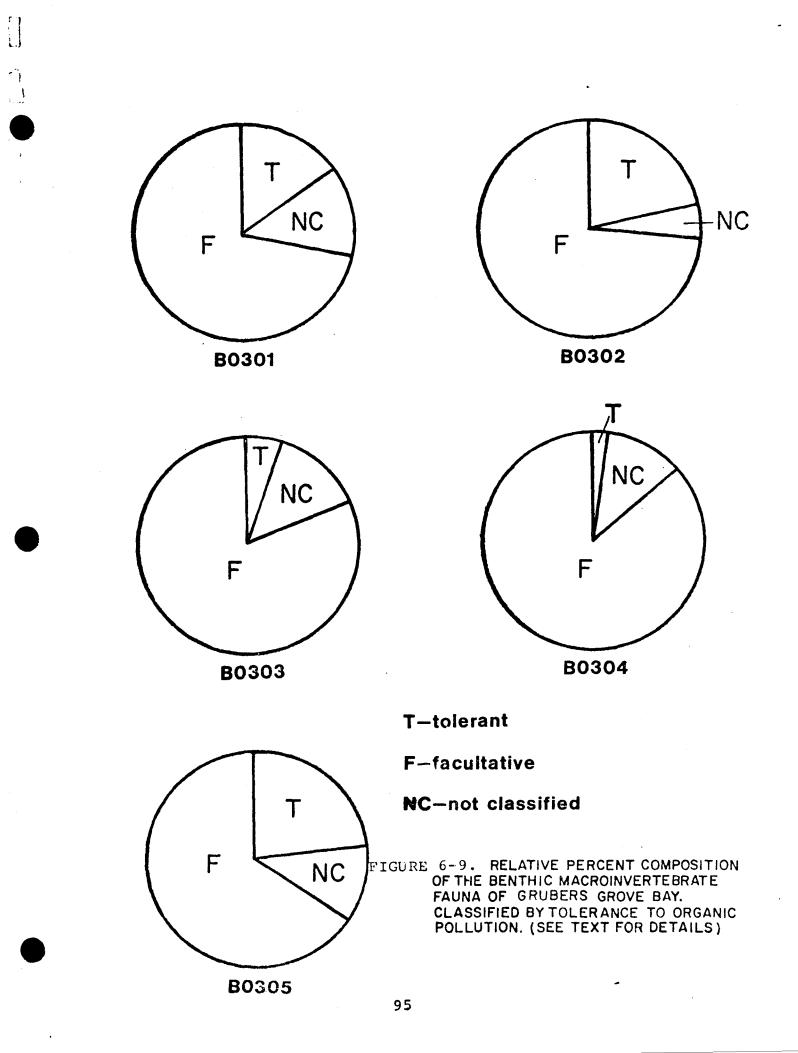
Statistical analysis of the benthic community structure was limited to an analysis of select populations from each bay examined. The five dominant taxa from each bay were tested separately for similarity of population size and variability by using the Mann-Whitney-U test for differences between small samples. This non-parametric test was chosen because of the small sample size (number of stations per bay = n = 5) and because it could not be assumed that the samples of each species were normally distributed (2). This same procedure was used to analyze the data on the number of taxa and total density at each station. Other statistical methods employed were simple descriptive statistics.

## Results

Benthic macroinvertebrates collected from two bays in Lake Wisconsin were categorized into 24 distinct taxa. The number of taxa collected at each sampling station varied from five (B0308, B0309) to thirteen (B0306). The dominant faunal types were aquatic Oligochaetes (16 percent of all organisms collected) and Diptera larvae (76 percent of all organisms collected). The Diptera larvae were composed of 59 percent Chironomidae, 25 percent <u>Chaoborus</u> and 16 percent <u>Palpomyia</u> (Ceratopoganidae). The results of the benthic sampling are presented in Table 6-7 as the number of organisms per square meter of bottom area.

Each taxon collected was classified as tolerant or intolerant of organic pollution on the basis of published information (1), (3), (4), (5). Most of the benthic organisms were classified as facultative, having adapted to some organic pollution; the remainder were either tolerant of organic pollution or not classified. The USEPA (1) defines tolerant species as organisms frequently associated with gross organic contamination which are generally capable of thriving under anaerobic conditions. Facultative organisms have a wide range of tolerance and frequently are associated with moderate levels of organic contamination.

Figure 6-9 illustrates the percentage of organisms (not species) collected at five stations in Grubers Grove Bay that were tolerant, to some degree, of organic pollution. A mean of 75.3 percent of all organisms collected in Grubers Bay were facultative (standard deviation =  $S_x = 8.1$ ) and a mean of



14.3 percent ( $S_x = 8.6$ ) were tolerant. Figure 6-10 provides similar data for Wiegands Bay with the mean percent of facultative forms 63.9 ( $S_x = 27.7$ ) and of tolerant forms 33.6 ( $S_x = 27.4$ ).

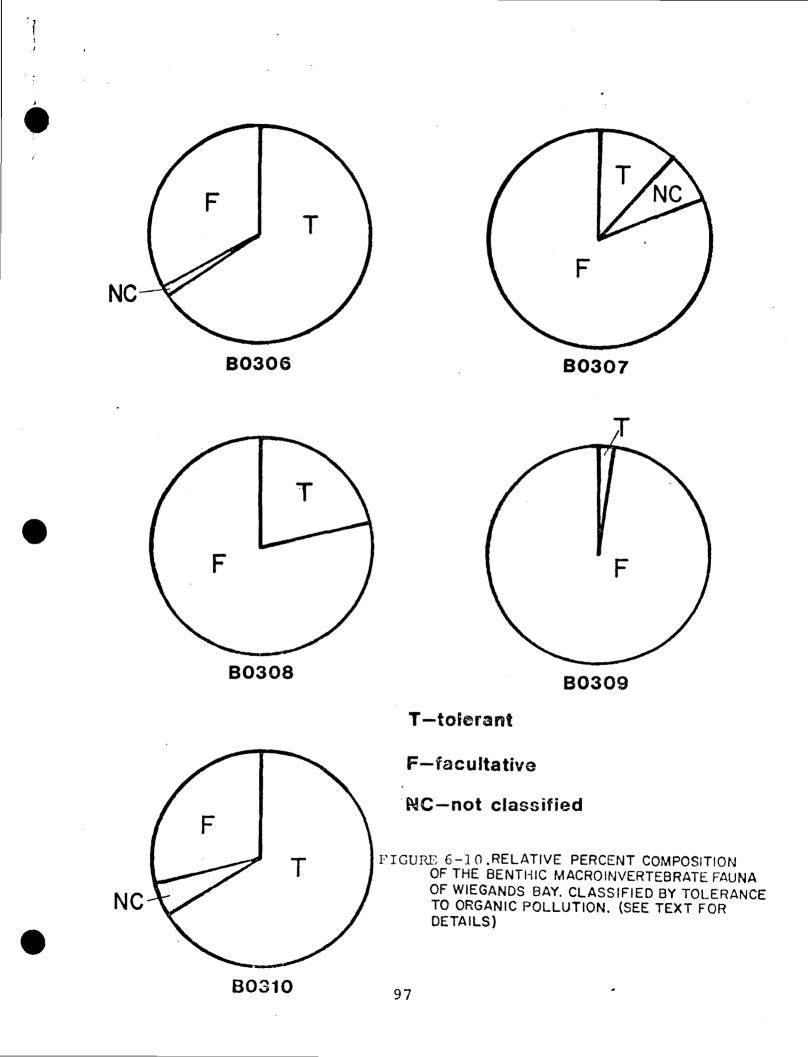
In Table 6-8, the species from each station are divided into the same pollution tolerant categories. This table deals with the number of species and not with organism density as in Figures 6-9 and 6-10. A significant difference in the species composition of Grubers Grove and Wiegands Bay is evident upon examination of the ratio of tolerant to facultative species in each bay. Grubers Grove Bay has an average ratio of tolerant:facultative species of 0.397; the ratio for Wiegands Bay is 0.540. The significance of this variation is apparent when one considers that, of the 24 species collected, 12 were obtained from both bays, five were taken only from Grubers Grove Bay, and seven were taken only from Wiegands Bay (Table 6-7).

Specific information on statistical differences in selected populations was obtained using the Mann-Whitney-U test. The procedure for this test employed the null hypotheses (H<sub>O</sub>) of no difference between the values of the two bays. If the null hypothesis could not be rejected after performing the required analysis, there would be no differences between the two bays. Rejection of H<sub>O</sub> indicated a significant difference between the bays. The test statistics and results of the Mann-Whitney-U analyses are summarized in Table 6-9.

## Discussion

The composition and structure of the benthic invertebrate communities in these two bays were investigated to determine the relative quality of the available habitats in Grubers Grove Bay. The presence of a large quantity of allochothonous sediment in Grubers Grove Bay, derived in part from precipitates of the water, wastewater and sanitary waste treatment processes of the Badger Army Ammunition Plant, may have affected the ability of this bay to sustain a healthy, diverse community of benthic invertebrates. In order to properly assess the current biological community, the composition, distribution and diversity of the community were determined and these factors were analyzed in relation to a background or "control" area.

Grubers Grove Bay yielded a mean 779 organisms per square meter at the five sampling stations. This compares favorably with the mean density of Wiegands Bay which was 610 organisms per square meter. Seventeen species were taken in samples from Grubers Grove Bay while 19 species were taken in Wiegands Bay.



## TABLE 6-8

1

° 1

## NUMBER OF SPECIES FROM EACH SAMPLING STATION AND THEIR CLASSIFICATION BASED ON TOLERANCE TO ORGANIC POLLUTION

	Tolerant	Facultative	Not Classified
B0301	2	8	1
B0302	3	6	3
B0303	2	7	2
B0304	1	5	2
B0305	3	4	3
B0306	3	9	1
B0307	2	7	1
B0308	2	3	0
B0309	2	3	0
B0310	3	4	2

## TABLE 6-9

MANN-WHITNEY-U TEST STATISTICS FOR THE NULL HYPOTHESIS (Ho) OF NO DIFFERENCE IN THE POPULATION IN GRUBERS GROVE BAY AND WEIGANDS BAY

	$n_1 - n_2$	<u>a</u>	Probability	Reject Ho
Limnodrilus	5	0.1	>0.1	No
<u>Chaoborus</u>	5	0.1	>0.1	No
Palpomyia	5	0.1	<0.1	Yes
Procladius	5	0.1	<0.1	Yes
Chironomus	5	0.1	>0.1	No
Number of Taxa	5	0.1	>0.1	No
Density	5	0.1	>0.1	No

NOTE: Mann-Whitney-U test statistics for the null hypothesis (Ho) of no difference in the populations in Grubers Grove Bay and Wiegands Bay.  $n_1$  and  $n_2$  are the number of sample points in the two bays;  $\alpha$  is the arbitrary level of significance; rejection of Ho indicates a statistically significant difference between the values of the test parameters of the two bays. Values for each n-parameter were taken from Table 6-7. Both the mean density and the number of species present indicate that the two bays were mesotrophic to slightly eutrophic. This trophic classification is reinforced by the relative percentages of the two dominant organism types, larvae of the Chironomidae and Oligochaetes (6).

Examination of the data presented in Figures 6-9 and 6-10 must be prefaced by the following qualifications. The basis for classifying a species as either tolerant or facultative was published information derived from diverse geographic locations. The limited level of taxonomic identification of these organisms prevented an absolute classification. Also, it must be remembered that this classification system was devised in conjunction with organic pollutants only, usually sanitary waste. The classification system was employed for comparative purposes in this study because it deals only with qualitative information on a gross community level.

The graphs in Figure 6-10 illustrate the high diversity of both tolerant and facultative organisms in Wiegands Bay. The overall physical and biological quality of the bay coupled with this diversity indicates a basically healthy, moderately diverse habitat range. The wide fluctuation in the percentage of pollution tolerant forms is probably an indication of localized stress that could result from a variety of indeterminate factors. Greater fluctuation in species composition/pollution tolerance indicates a more heterogeneous, patchy environment. The more heterogeneous the area, the more stable and therefore healthy the biological community (7)(8). Figure 6-9 indicates that Grubers Grove Bay lacks some of the variability that is found in Wiegands Bay. The relative stability of the proportions of facultative and pollution tolerant organisms is indicative of a more homogeneous environment, or less patchiness in the available habitat types.

The data presented in Table 6-8 and the ratios of tolerant: facultative species discussed previously (Results) help to reinforce the impression of differences in habitat patchiness. The overlapping ecological niches of pollution tolerant and facultative forms prohibit interpretation of qualitative differences between habitats in the two bays.

Statistical analyses of the five dominant species present in both Grubers Grove and Wiegands Bays must be interpreted with some knowledge of the ecology of the species examined. <u>Palpomyia</u> is a biting midge whose larval stage is essentially littoral. The preferred habitat of this genus is in floating mats of algae with overwintering accomplished by dispersion across the sediments in the areas of normal summer habitation. As indicated in Table 6-7, this species was found in significantly higher density in Grubers Grove Bay than in Wiegands Bay. Two possible explanations for this disparity are that Grubers Grove Bay is more stagnant during summer months and therefore accumulates a greater quantity of floating algal mats, or that the probability of finding algal mats at the sampling stations chosen in each bay was not equal. The date of sampling prevented assessment of these possibilities because cold weather and frost had killed off floating algae and the <u>Palpomyia</u> had already retreated to their overwintering benthic habitat. Although there was a significant difference in the populations of <u>Palpomyia</u> between the two bays, it was not possible to determine whether this was the result of true environmental difference or just an artifact of the sampling program.

There is a significant difference in the density of <u>Procladius</u> between the two bays with a larger population occurring in Grubers Grove Bay. The limited information on the ecology of <u>Procladius</u> and the physical/chemical characteristics of each bay do not allow for an explanation of this significant difference in populations. Additional information on the seasonal changes in some chemical parameters, especially dissolved oxygen and dissolved organics, would probably provide the necessary key to understanding the local biology of Procladius.

Additional efforts made to determine differences between the two bays (Table 6-9) included examination of three additional species and two calculated measures of community size. The inability to reject the null hypothesis in these few cases indicated a lack of significant differences between the bays.

These analyses therefore support the descriptive statistics discussed earlier that deal with the density and number of species in each bay. They underline the lack of real differences between the benthic biota of the two bays at both the organismal and community density levels.

#### Summary

The intent of the benthic invertebrate investigation was to provide the information needed to draw general conclusions on the effects of contamination. No gross differences in the biotas investigated were found and those that were apparent were a matter of degree and not composition. The reliability of the data interpretation was seriously impaired by the lack of any data on seasonal changes. The large changes in water chemistry that accompany the change of seasons also produce major changes in the faunal composition. During different seasons the parameters that limit growth change markedly. Examples of these potentially limiting parameters are temperature, dissolved oxygen, turbulence due to wave action and/or currents, turbidity, nutrient availability, light intensity, and light penetration. The presence of contaminants in the sediments or water may affect only a few of these parameters. If the faunal community is examined during a season where the affected parameters are not limiting, there may be no observable impact on the fauna. If that same location is examined during a season where the affected parameters are limiting, significant impacts on the faunal community may be observed. Therefore, the lack of data concerning seasonal variability within each of the two bays limits the conclusions which can be drawn from the results of this study to those outlined below.

## Conclusions of the Macroinvertebrate Study

- 1) Mean density, the number of species obtained and the proportional composition of the major taxa indicate that both bays are mesotrophic and similar in community structure.
- 2) Although it must be viewed with caution, the pollution tolerance classification system applied to both organism density and number of species indicates a strong possibility of decreased habitat patchiness and increased homogeneity of the benthic environment in Grubers Grove Bay when compared to Wiegands Bay.
- 3) Mann-Whitney-U analyses failed to demonstrate any significant differences between the benthic invertebrate fauna of Grubers Grove Bay and Wiegands Bay. The paradox presented by <u>Procladius</u> is probably the result of insufficient data on the chemical and physical ecology and may or may not represent a significant difference between the biotas in relation to the sediment quality.

# SUMMARY DISCUSSION OF THE RESULTS OF THE INVESTIGATIONS IN GRUBERS GROVE BAY

The primary purpose of the investigation conducted in Grubers Grove Bay and Wiegands Bay was to try to answer some of the questions that had arisen about the impacts of proposed dredging in Grubers Grove Bay. The questions which this investigation attempted to answer are:

 Are the sediments in Grubers Grove Bay contaminated with materials discharged during manufacturing operations at BAAP?

- 2) If the sediments are contaminated, what is the nature and extent of the contamination?
- 3) If the sediments are contaminated, are they having a measurable adverse impact on the aquatic ecosystem in the bay?
- 4) Would the sediments, if left in place, have any long term adverse effect on the environment?
- 5) Would dredging the sediments tend to release contaminants into the water that presently are trapped in the sediments?

The following discussion answers these questions on the basis of study results.

- 1) The sediments in Grubers Grove Bay appear to be contaminated with nitrocellulose discharged during manufacturing operations at BAAP. There appears to be a slightly higher concentration of di-n-butylpthalate (DBP) in the sediment in Grubers Grove Bay than in the sediment in Wiegands Bay. This compound may possibly have originated from BAAP. A high concentration of lead was found in one out of the eleven sediment samples from Grubers Grove Bay that were analyzed for lead.
- 2) Nitrocellulose contamination is widespread throughout the sediments in Grubers Grove Bay, as indicated both by analyses conducted specifically for nitrocellulose and by analyses for ammonia, one of its degradation products. High ammonia concentrations and a high COD are associated with the nitrocellulose contamination. DBP contamination, which may not have been derived from BAAP, is present only in very low concentrations. Lead contamination, if actually present, is not extensive.
- 3) The macroinvertebrate study indicated that there is no significant difference in the late fall benthos of Grubers Grove Bay and that of Wiegands Bay. The fish tissue analyses indicated that none of the BAAP - related organic compounds had accumulated in the five fish (three samples) tested.
- 4) As noted in Chapter 2 of this report, the water in the upper portion of Grubers Grove Bay is in a perched condition with respect to the underlying aquifer, and water from Grubers Grove Bay is recharging this aquifer. The apparently perched condition of the upper end of the bay indicates that the sediments in this area have a

low coefficient of permeability. Chemical analyses of these sediments revealed that they have a very high ammonia content. Therefore, it is likely that water containing a high concentration of ammonia may be slowly recharging the underlying aquifer, thereby contaminating the groundwater. This assumption has not been investigated. Since groundwater in this area is moving very slowly to the west - southwest (tens of feet per year), groundwater contamination, if present, will not have migrated very far in the 39 years since BAAP started manufacturing operations.

5) The sediment in Grubers Grove Bay has a high concentration of ammonia. Based on the perched condition of the bay with respect to groundwater and the results of nitrate anaylses of water samples collected in Grubers Grove Bay, it appears that this ammonia is not currently being released into the bay in significant concentrations. However, if the contaminated sediments are disturbed through dredging, this disturbance would certainly release some of the ammonia. Unless the return flow from the dredging operation was treated for ammonia removal (a very expensive treatment), the return flow would probably contain very high concentrations of ammonia. This release of ammonia would have a very detrimental, though short term, impact on the aquatic fauna in Grubers Grove Bay and the surrounding portions of Lake Wisconsin.

## LIST OF REFERENCES FOR CHAPTER 6

- (1) U. S. Environmental Protection Agency, 1973. <u>Biological</u> <u>Field and Laboratory Methods for Measuring the Quality</u> <u>of Surface Waters and Effluents</u>, EPA-670/4-73-001. Edited by Cornelius I. Weber.
- (2) Kuemmerer, Kenneth, 1976. Personal communication. The Mann-Whitney-U Test. Unpublished.
- (3) Illinois Environmental Protection Agency, 1978. <u>Tolerance</u> <u>Status of Aquatic Macroinvertebrate Organisms Found in</u> <u>Illinois Waters</u>. Effective January 1974.
- (4) U. S. Environmental Protection Agency, 1977. Environmental Requirements and Pollution Tolerance of Common Freshwater Chironomidae, EPA-600/4-77-024. William M. Beck, Jr.
- (5) Ross, Herbert H., 1944. The Caddis Flies, or Trichoptera, of Illinois. Illinois Natural History Survey Division Urbana, Illinois.
- (6) Wetzel, Robert G., 1975. Limnology, W. B. Saunders Company, Philadelphia, Pennsylvania.
- (7) Pielou, E. C., 1974. Population and Community Ecology, Principles and Methods, Gordon and Breach Science Publishers, New York, New York.
- (8) Emlen, J. Merritt, 1973. Ecology: An Evolutionary Approach, Addison-Wesley Publishing, Reading, Massachusetts.

## CHAPTER 7

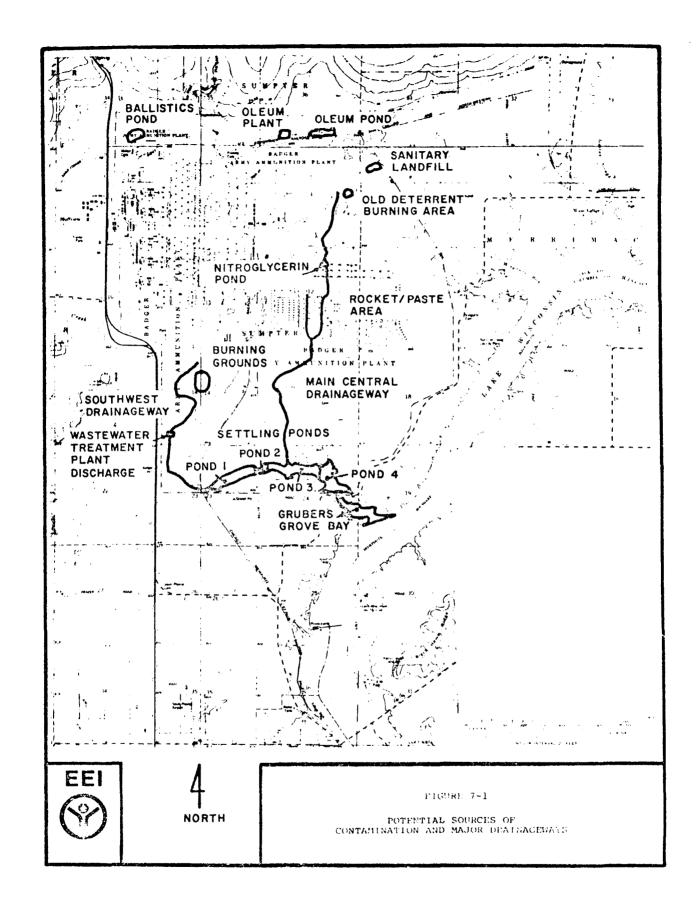
## INTERPRETATION OF THE SURVEY DATA

The interpretation of the analytical results is presented in two sections - the screening phase and the verification phase so that the discussion corresponds to the format of the survey, which was also divided into these two phases. The screening phase relied heavily on the use of GC/MS for qualitative screening of organic contaminants. Other parameters included in the screening phase as quantitative analyses included aluminum, lead, tin, nitrocellulose, nitrite, nitrate and sulfate. During the verification phase, samples were selectively subjected to quantitative analyses for parameters identified during the screening phase.

## INTERPRETATION OF SCREENING PHASE DATA

Interpretation of the results of the screening phase is best accomplished by relating the screening data with the potential pollution sources (Figure 7-1). For the data generated in this study, the pollutants observed in soil samples (see Tables 2-1 and 4-1) should be correlated with pollutants observed in the down gradient groundwater samples or the downstream water and sediment samples. This type of correlation is made in the following summary of the screening results. The analytical data on which this summary is based is included in Appendices I and K.

Certain parameters, especially the pthalates, are widespread environmental contaminants, and are often detected at trace levels even in very clean samples. BEHP (Bis(2-ethylhexyl) pthalate) was detected at widely varying concentrations in essentially every GC/MS run. Since this compound was not specifically used in manufacturing operations at BAAP, the BEHP results are not considered meaningful. Diethylpthalate and dibutylpthalate are commonly used compounds, and were also usually detected in at least trace amounts in the GC/MS runs. Since both of these compounds were used at BAAP, the higher concentrations of these compounds detected in the samples cannot be ignored. Generally, low (less than 10) ppm concentrations in soils/sediments, and low ppb concentrations in water are believed to be "background" concentrations, and not indicative of actual contamination.



# Source: Ballistics Pond; Sites Downgradient/Downstream: Well S1127

Well S1127 is downgradient from the Ballistics Pond. The contaminant of concern from the Ballistics Pond is aluminum. The concentration of aluminum in the sample collected from Well S1127 was less than (L.T.) 0.3 mg/1.

#### Source: Deterrent Burning Area (Soil Site S1402); Sites Downgradient/Downstream: Well S1122

The sample taken from Well Sll22 is downgradient from an old burning area on the plant grounds at which a variety of materials was handled. Soil sample site Sl402 is located within this burning area. Dinitrotoluene (DNT) was observed in this soil sample, but was not observed in the well sample.

#### Source: Oleum Plant (Soil Site S1416)

This site was considered a potential source of sulfate contamination for groundwater. Since the oxidation of elemental sulfur in nature is a very slow process, and since such limited quantities of sulfur were observed during the sampling trip, this site is no longer considered to pose a significant threat to groundwater, and no samples were analyzed.

Source: Oleum Pond (Soil Site S1416); Sites Downgradient/Downstream: Well S1132

This potential source was not investigated during the screening phase.

# Source: Sanitary Landfill; Sites Downgradient/Downstream: Well S1134

During purging operations conducted just before collecting the sample from Well S1134 (see Chapter 4), two unanticipated problems were noted. The first of these was the extreme turbidity of the water being removed; it felt greasy, similar to drilling mud. The second problem was the extremely low yield of the well. Approximately 16 feet of water was in the well before purging. The well was quickly bailed down to less than 1 foot of water. Approximately 18 hours later, the water in the well had still not risen to its original level (reached equilibrium). At that point it contained approximately 12 feet of water. By comparison, a measurable drawdown could not be achieved by bailing in most of the wells at BAAP. Except for the wells at the landfill (not installed as part of this study), the well with the lowest yield reached equilibrium within 2 hours after being bailed essentially dry. The extremely low yield for Well Sll34 could not be attributed solely to the small well diameter (2-1/2 inches, vs. 4 inches for the wells installed as part of this study).

No well construction or well development details were located for the three wells around the landfill (S1134, S1135 and S1136). Because the water which was purged from Well S1134 had the color (gray) and feel of drilling mud, it was assumed that one of the following had occurred. Either the drilling mud had not been completely flushed out from around the well, or the grout, which normally contains some bentonite (the major non-aqueous component of drilling mud), had seeped down around the outside of the well screen/perforated pipe during grouting operations. Either of these two situations might cause the screen and/or aquifer to become partially plugged, and might account for the low well yield.

The low well yield meant that the well could not be thoroughly purged before sampling (Table 4-3). As a result of this, and the obvious turbidity of the sample, the sample may not have been representative of the groundwater outside the immediate vicinity of the well.

The results of the screening phase analyses of this sample showed that it contained relatively high amounts of sulfate (237 mg/l), several hydrocarbons typical of fuel oil components, and dioxolone. The presence of dioxolone may have been a result of the glue used during well installation. The sulfate and hydrocarbons could have come from either the drilling and well installation procedures and materials or from the landfill. These results indicated that another well should be sampled during the verification phase to more accurately assess whether there was leaching from the landfill.

# Source: Nitroglycerin Pond (Soil Site S1404); Sites Downgradient/ Downstream: Soil Sites S1406, S1408 and S1409

A trace amount of nitroglycerin (NG) was detected in the sediment sample collected from the Nitroglycerin Pond on the first sampling trip. Nitroglycerin was not specifically analyzed for in any of the other samples. Since it is so readily degradable in the environment, its presence in the sediment of the pond was surprising. It was recommended that additional samples be checked for the presence of nitroglycerin during the verification phase.

# Source: Burning Ground (Soil Sites S1410 & S1411); Sites Downgradient/Downstream: Well S1117

Soil site S1410 was essentially clean. Soil site S1411 contained DNT in the ppm range, DEP at ~240 ppm, DBP at ~311 ppm, diphenylamine at 28 ppm and nitrodiphenylamine, as well as 1.6 percent lead, and 0.1 percent tin. The presence of nitrodiphenylamine at BAAP was not anticipated, but is not entirely surprising in view of the diphenylamine and nitric acid used at the site. Well S1117 was relatively clean, but did appear to contain carbon tetrachloride and chloroform. Since these compounds are common laboratory contaminants which are sometimes introduced during sample handling, it was recommended that Well S1117 be resampled during the verification phase and checked for the presence of these compounds.

## Source: Wastewater Treatment Plant (Soil Sites S1413 and S1414) and Settling Ponds (Sites S1201-S1207); Downgradient/Downstream Sites: Wells S1133 and S1102-S1108

Nitrocellulose, lead, the DNTs, diphenylamine, and DBP, were found in the S1413 - S1414 sediment samples in high ppm levels. Nitrodiphenylamine was also found at these sites. The higher levels of pollutants observed at S1414 were surprising, but may be due to the washing action of a sanitary waste outfall located near S1413.

Sediment sampling Site S1201 is located on the upstream portion of the first settling pond and had high ppm levels of 2,6-DNT, 2,4-DNT, diphenylamine (DPA), and DBP as well as nitrodiphenylamine, nitrocellulose (6 percent), and sulfate (0.1 percent). S1204 (which is at the downstream end of the first pond) had lower (but still ppm ranges) of 2,4-DNT, DPA and DBP as well as a few natural product compounds and 336 ppm of nitrocellulose. S1206 (settling pond 3 sediment) had high molecular weight alcohols and a compound that appears to be a carbamoylpyrazoline. The latter compound has no apparent source and does not appear to be environmentally significant.

The sediment sample at site Sl207, which is in pond 4, had high molecular weight alcohols, 0.46 ppm DPA, 2.6 ppm DBP, 0.22 ppm of 2,6-DNT, and 0.1 percent nitrocellulose.

It should be noted that the sampling locations for Sl204, Sl206 and Sl207 were in areas where most of the recent sediment had been removed (Chapter 4). The point at which Sl201 was sampled was slightly to the side where not all of the material had been removed. The concentrations of compounds (higher at Sl201 than at the other locations) are consistent with this observation. Well S1133 (upgradient from the settling ponds and downgradient from the treatment plant outfall) was clean. Well S1107 showed traces of DEP (possibly at concentrations high enough to indicate actual contamination - 8 mg/l). Well S1108 showed traces of DPA as well as an oxygen-containing compound of unknown origin.

### Source: Rocket/Paste Area; Downgradient/Downstream Sites: Soil Sites S1408, S1409, and S1415

The soil/sediment samples at Sites S1408 - S1415 showed little evidence of organic contamination. Some DNT was observed at S1415. Natural esters were seen at S1408 and S1409. S1409 also showed several hydrocarbons and S1415 had nitrodiphenylamine. S1408 contained 0.1 percent lead.

# Wells Sampled During the Screening Phase Not Related To Suspected Sources Of Contamination

Other wells screened during the survey included Slll2, Sll23, Sll09, Slll1, Sll15, Sll19, Sll21, Sll25, Sll27 and Sll30. Significant observations at these sites are discussed below:

- S1112 Benzothiazol, methyl ethyl ketone and cyclohexanone were tentatively identified at this site.
- 2) S1123 High molecular weight carboxylic acids typical of greases were observed. This well was installed by Warzyn (as were S1124 and S1101) in lower permeability soil than other wells. Greases and oils are sometimes used by drillers quite liberally. Since the well had a relatively low yield, it was not purged as thoroughly as many of the other wells (see Table 4-3). Grease from the drilling tools may not have been completely flushed and purged from the area around the well prior to sampling.
- 3) Sllll This site is located next to a bunker. DEP (at 3 ppb), ketone and cyclohexanone were identified at the site.
- 4) S1119 This site had methyl ethyl ketone and hydrocarbons typical of a fuel oil. The oil may have been introduced during drilling, or may have come from a fuel oil spill.
- 5) S1109, S1115, S1121, S1125, S1127, S1130 These wells were found to be clean.

Based upon a review of the screening data, USATHAMA requested the following tasks as the verification portion of the survey:

- 1) Groundwater samples (S1100 Series)
  - a) Quantification of nitrates and nitrites at wells
     2, 3, 5, 6, 7, 8, 13, and 33 after re-sampling the wells.
  - b) Quantification of sulfate at wells 30, 31 and 32 after re-sampling.
  - c) Quantification of nitroglycerin at well 24, the nitroglycerin pond water and the nitroglycerin pond sediment. The sites were to be re-sampled and the analyses expedited to avoid nitroglycerin decomposition which may have occurred during screening. The results were intended as verification of the presence of nitroglycerin, not as quantification of the levels.
  - d) Quantification of 2,4-DNT at wells 2, 3, 4, 5, 7, 8, 9, 11, 13, 21, 22, 23, 30 and 33 after re-sampling.
- 2) Settling Ponds (S1200 Series)
  - a) Screening for DBP and DEP using gas chromatographyelectron capture in sediments of sites 2, 3, and 5. Previously collected sediments were to be used for sites 2 and 3. Site 5 has no sediment in the lagoon because sediments were previously bull-dozed out. Two samples of removed sediment were, therefore, to be collected from the spoils pile near site 5 for this analysis.
  - b) Quantification of 2,4-DNT using gas chromatographyelectron capture in the samples collected for DBP and DEP analysis.
  - c) Analysis for DBP, DEP and 2,4-DNT in the subsoils of all borings (1 - 7). Collection of a sediment for site 6 was to be done in the same manner as for site 5 discussed above.
- 3) Grubers Grove Bay (S1300 Series)

Additional analyses were requested for samples collected as part of the study on Grubers Grove Bay (see Chapter 6). In addition to the verification analyses originally agreed upon, the following items were requested at a later date:

- Quantification of chloroform and carbon tetrachloride in wells 2, 4, 7, 8, 9, 17, 21, 23, 30 and 33 because of screening results indicating levels of these pollutants at or slightly above background (laboratory blank) levels.
- 2) Analysis of seven wells three AEHA/DNR wells (34, 35 and 36), 17, 21, 23 and 28 for COD, pH, conductivity, alkalinity, hardness, iron, TKN, sulfide, and nitrate on fresh samples after re-developing DNR wells and re-sampling all the wells.
- 3) Analysis of eight groundwater samples (2, 4, 7, 8, 21, 23, 28 and 33) for the priority pollutant metals: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc. All groundwater samples were to be recollected.
- 4) Analysis of groundwater samples (2, 4, 7, 23 and BAAP No. 4) and one surface water sample (STP outfall) for pesticides and PCBs using EPA Method 608 after resampling.

The verification samples are summarized in Table 7-1.

### INTERPRETATION OF VERIFICATION PHASE DATA

Results of the verification phase are presented in the same manner as the screening phase results. These results are first discussed in relation to potential sources of contamination followed by a general discussion of results.

Tables 7-2, 7-3 and 7-4 summarize the analyses conducted on the different categories of samples. The results of the analyses are shown in Appendix I. Figure 7-1 indicates the location of the ten suspected sources of contamination. These sources include:

- 1) Ballistics Pond
- 2) Oleum Plant
- 3) Oleum Pond
- 4) Sanitary Landfill
- 5) Deterrent Burning Area
- 6) Nitroglycerin Pond
- 7) Burning Grounds
- 8) Wastewater Treatment Plant
- 9) Rocket/Paste Area
- 10) Settling Ponds

# SUMMARY OF VERIFICATION SAMPLES

	Water	Sediment	Fish	Total
Nitrates	8	2	-	10
Nitrites	8	-	-	8
Sulfate	3	2	-	5
Nitroglycerin	2	1	-	3
2,4-DNT	14	24	-	38
GC/EC DBP/DEP	-	20	-	20
GC/MS Screen	3	-	3	6
Pesticides/PCB	-	-	3	3
Grain Size	-	22	-	22
рН	-	27	-	27
COD	_	27	-	27
Cation Exchange Capacity	-	23	-	23
Ammonia	-	24	-	24
Lead	-	2	-	2
Tin	-	2	-	2
Aluminum	-	2	-	2

Does not include QA/QC samples.

# PARAMETERS ANALYZED IN SURFACE SOILS

Sl4 <u>XX</u> (Sample Point)	Sample Number	Aluminum, Lead and Tin	Nitrate/ Nitrite	lSulfate	Nitroglycerine	Nitrocellulose	GC/MS  Pesticides/PCBs
02	D5002	x	X	Х			Х
04	D5033 M0054	х			X X		
08	D5008	х	х	Х			х
09	D5009	х	х	Х			х
10	D5010	х		Х		х	х
11	D5011	х	х	Х			х
13	D5013	X		X		х	X X
14	W0051 D5014	х	х	х			X
15	D5015	х	x	х		х	х

-	

Site ID	Depth Interval (feet)	Sample Number	Nitrocellulose	GC/MS Screen	Lead, Tin and Aluminum	DNT	Nitrite/ Nitrate	Sulfate	DEP	DBP
1201	0-2	D5018	X	x			x	x		
1201	2-16	D5019U	-			х			х	x
1201	16-30	D5019L				x x			х	x x
1202	0-2	M0001			x			x		
1202	2-16	D5020,U,S			•	x			X	х
1202	16-30	D5021				x x			x	x x
1203	0-3	M0002			х	х		x	х	х
1203	3-16	D5022				X X			х	x x
1203	16-30	D5023				х			х	х
1204	0-5	M0003	х	x	х		x	x		
1204	5-19	D5024C				Х			х	x
1204	19-30	D5026				x			х	x
1205	0-15	D5027			x	x x	x	x	x	x x
1205	15-30	D5028				x			x	x
1206	0-15	D5029	х	х	x	х	х	x	x x	x x
1206	15-30	D5030				x			х	x
1207	0-2	M0004	х	x	x		х	x		
1207	2-15	D5031				x			Х	x x
1207	15-30	D5032				x x			х	х
N-side Pond 2 "S1205"	0-1	M0050				x			x	x
N-side Pond 3 "S1206"	0-1	M0051				х			x	x

TABLE 7-3 PARAMETERS ANALYZED IN SETTLING POND SEDIMENTS

Site ID	Carbon Tetr./ Chloroform	GC/MS Screen	Metals I <sup>(a)</sup>	Metals II <sup>(a)</sup>	Pesticides/ FCBs	DNT	Nitrite/ Nitrate	Sulfate	Nitroglycerin	Hardness, Alka- linity, Sulfide, TKN, pH, COD, Conductivity, Iron, Nitrate
\$1102         \$1103         \$1104         \$1105         \$1106         \$1107         \$1103         \$1103	х	Х	х	Х	х	Х	х	Х		
S1103					• <u></u>	Х	X			,
S1104	Х	X	X	X	X	X	X	X		
S1105						Х	X			
S1106							X			
<u>S1107</u>	Х	Х	Х	X	X	X	X	X		
<u>51103</u>	X	Х	Х	Х	······································	X	X	X	····	
<u>S1109</u>	Х	X	X			X	X	X		
S1111       S1112       S1113       S1115       S1117		X	X			Х	X X	X		
<u>S1112</u>		X	Х					X		
<u>S:113</u>		X X	v			Х	X X	X		
<u>S1115</u>	X	<u>х</u> Х	X X				<u> </u>	- <u>X</u>		X
<u>S1117</u> S1119	<u> </u>	<u> </u>	- <u>^</u> X		····		- <u>x</u>	<u> </u>		Δ
<u>S1119</u> S1121	X	<u>X</u>	- <u>x</u>	X		X	<u>X</u>	$\frac{\Lambda}{X}$	<u> </u>	X
<u>S1121</u> S1122	Λ	- <u>X</u>	$\frac{x}{X}$	<u></u>		- <u>X</u>	$\frac{X}{X}$	$\frac{\Lambda}{X}$	X	Λ
<u>S1122</u> S1123	X	X	$\frac{X}{X}$	X	X	$\frac{\Lambda}{X}$	<u> </u>	$\frac{X}{X}$		X
S1124		X							X	* * 
<u>S1125</u>			X				X			
<u>S1125</u> S1127		X	<u> </u>				X	X		
S1128				Х			X			X
S1130	X	X	X	·		X	X	X	<u> </u>	
S1131								X		
s1132								X		
S1133	X	X	X	X		X	X	X		
S1134=DNR-2		X	X				X	X		X
S1135=DNR-3	······································	Х								X
S1136=DNR-1										Х
S1137=BAAP-4					Х					

ANALYSES PERFORMED ON GROUNDWATER SAMPLES

NOTES: (a) Metals I = Aluminum, Lead and Tin

Metals II = Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Te, Zn

Many parameters were found to be either below the analytical detection limit or at a concentration of less than 1.5 times the concentration in background samples for all of the samples checked. These parameters are judged to be absent or at environmentally insignificant levels and will, therefore, not be further discussed. Table 7-5 lists these parameters, detection limits, and background concentrations.

Several of the remaining parameters were found to be of concern in only one or two categories of samples (e.g. nitrocellulose in the S1200s and S1400s, but not in the wells - S1100s). Tables 7-6 through 7-11 contain only those samples within a given category that were found to contain at least one parameter at or above a concentration which might indicate some degree of contamination. These limits of concern are provided in Table 7-12. The GC/MS results (Tables 7-9 through 7-11) report only those compounds which EEI believes could conceivably have come from operations at BAAP.

For any given sample which appears in Tables 7-6 through 7-8, results for all of the parameters shown in the table have been listed, regardless of whether the concentrations were at or above the limits shown in Table 7-12. This was done in order to show whether there were any additional parameters beyond those which indicated the need for sampling that may be close to the limits in Table 7-12.

#### Source: Ballistics Pond

No additional analyses were conducted regarding the Ballistics Pond beyond those performed during the screening phase.

#### Source: Oleum Pond

The suspected groundwater contaminant originating from the Oleum Pond was sulfate. Well Sll32 is downgradient from the Oleum Pond. Water from well Sll32 was examined for sulfate, and the sulfate content was found to be below the detection limit of 6 mg/1.

#### Source: Oleum Plant

No additional analyses were conducted regarding the Oleum Plant.

PARAMETERS FOUND NOT TO BE OF CONCERN AT BAAP (NOT DETECTED OR LESS THAN 1.5 TIMES BACKGROUND)

	Detection	Backgro	ound
Parameter	Limit (a)	<b>Conc</b> entration	Site Reference
Silver Arsenic Beryllium Cadmium Chromium	3 6 47 1 4	ND(b) ND ND ND 11	- - - Well 23
Mercury Selenium Antimony Thallium Zinc	0.5 2 6 3 (c)	ND ND ND 69	Well 23
Sulfide (mg/l) pH (units) TKN (mg/l) Aldrin α-BHC β-BHC	1 (c) 1 0.03 0.17 0.03	ND 6.2-7.6 ND ND ND ND	Total Range Found - - - -
Chlordane Dieldrin α-Endosulfan β-Endosulfan Heptachlor	0.11 0.16 0.02 0.06 0.12	ND ND ND ND	- - - -
PPDDD PPDDE PPDDT Toxaphene	0.06 0.11 0.09 8.9	ND ND ND ND	- - · ·
PCBs: A1016 A1221 A1242 A1248 A1254 A1260	1.1 3.0 1.3 0.7 2.4 2.3	ND ND ND ND ND	- - - - -
(b) ND =	parameters in µg/ = Not Detected detected above 1.		

shown.

# SUMMARY OF POSITIVE ANALYTICAL RESULTS: WELLS (S1100 SERIES)

Saythur	Site I. D. No.	Sample <u>No.</u>	NO3 (ug/1)	CUTOT(a) (ug/l)	LIN (b) ( <u>ug/1)</u>	S04 (mg/1)	CCL4 (ug/1)	CHC13 (ug/1)	ALK (c) (mg/1)	Hard(d) (mg/l)	COD (mg/1)	Fe (mg/1)	Pt. (ug/1)	COND (e)
Ste boundary		A0001 A0066	16 8.2	NA 30	NA .07	140 NA	na Nd	NA ND	NA NA	NA NA	NA NA	NA NA	10 NA	NA NA
0	\$1108	A0004	ND	NA	NA	160	NA	NA	NA	NA	NA	NA	ND	NA
	S1117	A0050	2.2	NA	NA	NA	10	70	300	400	5	1	на	<b>5</b> 00
	S1121	A0056	.33	ND	NA	NA	ND	ND	200	300	. 50	.5	.6	400
	s1123	A0052	3.9	10	ND	NA	ND	ND	200	300	ND	2	10	300
	S1133	A0061	2.9	10	NA	NA	.7	ND	NA	NA	NA	NA	10	NA
	S1134	A0022 A0070	1.3 2.5	na Na	NA NA	240 NA	NA NA	NA NA	NA 300	NA 1000	NA 10	NA 1	20 NA	NA 1000
	\$1135	A0071	1	NA	NA	NA	NA	NA	400	700	6	6	NA	600
12	<b>S1136</b>	A0072	5.3	NA	NA	NA	NA	NA	300	300	9	2	NA	500

120

١

£

NOTES: NA = Not Analyzed NI = Not Detected (3)CUTOT = Total Copper (D)LIN = Lindane (c)ALK = Alkalinity (d)Hard = Hardness (e)COND = Conductivity

TABLE 7-7	
-----------	--

#### NC(a) DEP(b) Site I.D. 24DNT Sample Depth S04 (%) (ug/g) (%) No. No. (cm) (ug/g) S1201 0.13 D5018 0 6 NA NA D5019L 457 0.1 NA NA ND 0.1 D5019u 457 NA ND NA s1202 0.7 D50205 91 NA 1300 NA s1203 D5022 91 100 17 NA NA D5023 11 0.3 NA 488 NA M0002 170 .066 0 NA 460 s1204 M0003 0.03 NA .0058 0 NA D5024C 152 5 0.7 NA NA D5026 579 .02 NA ND NA s1205 D5027 0 NA ND 40 .0020 D5028 NA 457 NA ND ND M0050 18 NA NA 1375 8 s1206 .0002 .0015 ND .06 D5029 0 D5030 457 ND NA NA ND M0051 18 40 3 NA NA **S1**207 M0004 0 .018 .1 NA NA

#### SUMMARY OF POSITIVE ANALYTICAL RESULTS: SETTLING PONDS (S1200 SERIES)

NOTES: NA = Not Analyzed

ND = Not Detected

(a) NC = Nitrocellulose

(b) DEP = Diethylpthalate

.

# SUMMARY OF POSITIVE ANALYTICAL RESULTS: SURFACE SOILS AND DRAINAGEWAYS (S1400 SERIES)

Site I. D. No.	Sample No.	Depth (cm)	NG (a) (ug/g)	NC (b) (%)	24DNT (ug/g)	\$04 	Pb (ug/g)	Pb (ug/1)	NO3 (ug/g)	Sn (ug/g)	ENDRN(C) (ug/l)
51402	D5002	0	NA	NA	NA	.025	600	-	ND	8.5	NA
S1404	D5003 W0020	0 45	4 ND	NA NA	NA NA	NA NA	NA -	200	NA ND	3.0 ND	NA NA
S1408	D500E	0	NA	NA	NA	.003	1000	-	2.5	6.6	NA
S1411	D5011	0	NA	NA	NA	.003	20,000	-	1.4	1200	NA
S1413	D5013 W0051	0 10	NA NA	3 NA	NA NA	.047 NA	400 NA	-	NA NA	2.4 NA	NA .06

NOTES: NA = Not Analyzed ND = Not Detected "-" = Inappropriate units for that sample (a)NG = Nitroglycerin (b)NC = Nitrocellulose (c)FNDRN - Endrin

Site I.D. No.	DPA (b) (ug/1)	DEP(C) (ug/1)	MEK(a) (ug/1)	Hydrocarbons (a)	Cyclohexanone (ug/l)	Ketones (ug/1)
S1107		8				
S1108	1					
S1111		3				16
<b>S111</b> 2			27		11	
S1119			14	x		
S1134				x		
S1135				x		

SUMMARY OF GC/MS RESULTS: WELLS (S1100 SERIES)

TABLE 7-9

NOTES: (a)Several different hydrocarbons at different concentrations
 (b)DPA = Diphenylamine
 (c)DEP = Diethylpthalate
 (d)MEK = Methyl ethyl ketone

123

١.

Site I.D. No.	Sample No.	2,6-DNT (ug/g)	2,4-DNT (ug/g)	DPA(a) (ug/g)	DBP(b) (ug/g)	Nitrodiphenylamine (ug/g)
<u>s1201</u>	D5018	138	998	470	>1300	28
S1204	M0003		1	1.8	29	
S1206	D5029				0.14	
S1207	M0004	0.5	,	1.1	5.9	

SUMMARY OF GC/MS RESULTS: SETTLING PONDS (S1200 SERIES)

1
N
4

.

NOTES: (a)DPA = Diphenylamine (b)DBP = Dibutylpthalate

# SUMMARY OF GC/MS RESULTS: SURFACE SOIL AND DRAINAGEWAYS (S1400 SERIES)

Site I.D. No	2,6-DNT (ug/g)	2,4-DNT (ug/g)	<sub>DPA</sub> (a) (ug/g)	DBP(b) (ug/g)	DEP(C) (ug/g)	NDPA (d) (ug/g)
S1402	2	9				
S1411	12	118	35	389	295	χ(e)
S1413	46	697	318	887		2
S1414	35	954	255	520	1	11
S1415	4	36				1

NOTES: (a)DPA = Diphenylamine
 (b)DBP = Dibutylpthalate
 (c)DEP = Diethylpthalate
 (d)NDPA = Nitrodiphenylamine
 (e)X = Not Quantified

٩

## CRITERIA FOR INCLUSION IN TABLES 7-6 THROUGH 7-8

Analyte	In Water	In Soil/Sediment
ALK	250 mg/1	-
AL	5 mg/l	5%
CCL4	DL	NA
CHCL3	DL	NA
COD	5 mg/l	
COND	500 UMHC	-
CUTOT	10 ug/1	NA
DEP	NIC	DL
2,4-DNT	DL	DL
ENDRN	DL	NA
FE	0.1 mg/1	NA
HARD	250 mg/l	-
LIN	DL	NA
NC	NIC	0.01%
NG	DL	DL
NO3	10 mg/1	l ug/g
PB	10 ug/1	200 ug/g
SN	DL	10 ug/g
SO4	150 mg/1	0.1%

All others: 1.5 times background concentration or DL, whichever is greater.

NOTES: DL = Detection Limit "-" = Not appropriate for this medium, or inclusion in these tables

### Source: Sanitary Landfill

Wells S1134, S1135 and S1136 are in the immediate vicinity of the sanitary landfill. These wells are in an area which has an extremely low water table gradient. Therefore, the direction of groundwater flow is not well defined. Wells S1134 and S1135 are in the most likely downgradient direction from the landfill, but landfilling operations may have altered the local flow patterns.

The parameters of conductivity, hardness, and iron found in samples from wells S1134 and S1135 are significantly higher than those from samples from the rest of the wells. However, very little is known concerning the drilling procedures used or the construction of the wells. Problems identical to those discussed regarding the sampling of Well S1134 during the screening phase were also encountered at Wells S1134 and S1136 during the verification phase. At Well S1135, turbid, greasy feeling water was encountered; however, after redeveloping the well through swabbing and surging, the yield increased noticeably to the point where it could not be bailed dry using the materials and methods described in Chapter 4. Though thoroughly purged, the sample from this well was still fairly turbid.

Because of the problems encountered in sampling these wells, it is not apparent whether the characteristics of the sample relate to contamination from the landfill or represent an artifact of well construction.

#### Source: Deterrent Burning Area

DEP, DBP and DNTs were found in soils within the burning area during the screening phase. Well S1122 was resampled during the verification phase and analyzed for the presence of DNT because the quantitative method for DNT has a lower detection limit than the screening method. No DNT was detected.

#### Source: Nitroglycerin Pond

Well S1124 is directly downgradient from the nitroglycerin pond. The sediment sample collected from the pond during the screening phase contained a small amount of nitroglycerin.

Sediments and water in the pond, and water from well Sll24, were collected during the verification phase and analyzed for the presence of nitroglycerin. No nitroglycerin was detected. However, the sediment sample collected during the verification phase was taken from the center of the pond (or close to the center). The sample collected during the screening phase was a composite of subsamples taken from several locations around the edge of the pond. The absence of nitroglycerin in the verification sample is interpreted to be a result of a nonhomogeneous occurance of low levels of nitroglycerin in the sediments, rather than a failure to confirm the screening results.

#### Source: Burning Grounds

Well Slll7 is directly downgradient from the burning grounds. Samples collected and analyzed via GC/MS from this well during the screening phase indicated the possible presence of chloroform and carbon tetrachloride in trace amounts. The well was resampled during the verification phase and analyzed for the presence of chloroform and carbon tetrachloride using a more sensitive GC method. Carbon tetrachloride was detected at a concentration of 12  $\mu q/l$ ; chloroform was detected at a concentration of 66  $\mu$ g/l. Both concentrations are significantly higher than the detection limits (carbon tetrachloride equals 0.3 µg/1; chloroform equals 2.3  $\mu$ g/l). Chloroform was not detected in the nine other wells checked for this compound, and only a trace amount of carbon tetrachloride was detected in one of the ten wells checked (S1133: 0.7  $\mu$ g/1). The analytical significance of this value is questionable in that the precision of the method (precision was not determined during this survey) makes 0.7  $\mu$ g/l potentially indistinguishable from 0.3  $\mu$ g/l. As a point of reference, proposed water quality criteria (Federal Register, November 28, 1980) set limits for the protection of human health at 1.9  $\mu$ g/l and 4  $\mu$ g/l for chloroform and carbon tetrachloride respectively.

The presence of these chlorinated compounds in the groundwater in association with the burning ground is plausible if halogenated solvents were used in past burning activities.

#### Source: Wastewater Treatment Plant

During the screening phase, several contaminants were detected in sediments from the drainageway which leads into the settling ponds. Water in the drainageway at site S1413 was sampled during the verification phase and analyzed using a GC technique for the presence of certain pesticides and PCBs (Table 7-2). Two pesticides were detected; endrin and  $\Delta$ -BHC. The concentrations of these pesticides were 0.066 µg/l and 0.14 µg/l, respectively. Detection limits for these compounds were 0.03 µg/l and 0.026 µg/l, respectively. The sources of water in this drainageway (at the point sampled) are dominated by sanitary and industrial wastewater treatment plant discharges. An estimated 10 percent of the flow at the time of sampling originated from upstream of the two discharges. The most likely source of these pesticides is agricultural runoff.

#### Source: Rocket/Paste Area

No additional analyses were conducted during the verification phase regarding this potential source.

#### Source: Settling Ponds

Results of the screening analyses indicated that the sediments (and at least the upper layer of soil in the settling ponds) were contaminated with DNT, phthalates, and nitrocellulose. The deeper soils and sediment samples (that had not previously been analyzed) were analyzed for DNT, DBP and DEP using quantitative GC methods. Of these compounds, only DBP was not detected.

Two of the sediment samples that were analyzed, M0050 and M0051, were collected from areas along the north sides of ponds 2 and 3, respectively. These were collected from areas where sediments from the ponds had been deposited during a draglining operation to remove the sediments from the ponds. Therefore, these two samples (and their high concentrations of DNT and DEP) are probably more representative of the sediments originally in the ponds than are the soils actually sampled in the ponds.

The verification analyses generally confirmed the presence of highly variable concentrations of DNT and DEP in the sediments. The concentrations of these parameters seem to decrease sharply within the top few feet of soil and typically approached (or were below) the detection limit in the 15 to 30 foot deep composite samples.

Wells Sll02 - Sll08 are directly downgradient from the settling ponds, and all except Sll06 were analyzed for the presence of DNT using a GC method. None was detected.

#### GENERAL DISCUSSION

Sediment and surface soil samples collected from many of the suspected sources of contamination contained high concentrations of various contaminants. With the exception of wells in the vicinity of the sanitary landfill and well Slll7 (burning grounds), the groundwater samples showed no evidence of significant contamination. The sample from well Slll7 had significant concentrations of chloroform and carbon tetrachloride. The degree to which the well samples collected in the vicinity of the sanitary landfill are representative of the groundwater quality is somewhat questionable, but the results do indicate that the groundwater may be contaminated.

# CHAPTER 8 CONCLUSIONS

The conclusions regarding groundwater contamination are based in part on results of the geotechnical investigation and in part on the results of the sampling and analysis program. One important aspect of the geotechnical investigation was the information obtained on groundwater flow directions and speed. Table 8-1 contains a summary of groundwater flow velocities (direction and speed) at each potential source of contamination and indicates which, if any, of the monitoring wells are within the theoretical contaminant plume. Figure 8-1 illustrates this data. The results of the study are discussed for each suspected source of contamination in this section.

### SOURCE: BALLISTICS POND

Well S1127 is well within the theoretical migration distance for contaminants originating in this pond. Because of the low level of aluminum (the contaminant of concern) found in the water of this well, it can be concluded that contamination of groundwater is not occurring from this source.

#### SOURCE: OLEUM PLANT

The contaminant of concern at the Oleum Plant is sulfur. Elemental sulfur was visibly evident on the ground surface throughout the immediate vicinity of the plant, but only as scattered localized small "spills". Only one small (less than 1 acre) area was observed where sulfur was evident in more than scattered, small amounts. The sulfur found in this low lying area was distributed evenly, but was still evident in only scattered patches.

The exposed sulfur is probably being slowly oxidized to sulfate, which would then leach into the soil. However, because of the relatively small total quantity of sulfur at the Oleum Plant, and the slow rate of oxidation of sulfur at ambient temperatures, it can be concluded that, even if sulfate is leaching into the ground, it would have very little potential for significant contamination of the groundwater at BAAP.

#### TABLE 8-1

۸

Sec. Sec.

#### GROUNDWATER FLOW VELOCITIES

	Flow Veld			11-11 - 11i - 1- i-	Coefficient	,		
Source	Direction	Speed (ft/yr)	Distance Traveled Since 1942 (ft)	Wells Within Distance Traveled	of Permeability (k)(ft/yr)	Well Number	Water Table Gradient (ft/ft)	Assumed Porosity
Settling Ponds (West End)								
MAXIMUM MINIMUM	<b>s</b> s	68 11	2,580 435	S1102 & S1103 S1102 & S1103	7,316 3,300	S1103 S1102	$1.39 \times 10^{-3}$ 1.39 x 10 <sup>-3</sup>	0.15 0.40
Settling Ponds (middle)								
MAXIMUM	S	64	2,450	\$1104,51105,	6,959	S1106	1.39 x 10 <sup>-</sup> '	0.15
MINIMUM	S	13	490	S1106 None	3,732	51104	1.39 x 10 <sup>-3</sup>	0.40
Settling Fonds (Last End)								
MAXIMUM MINIMUM	SW Sw	43 10	1,640 370	51108 & 51107 51108	2,281 2,796	S1108 S1107	2.83 x 10 <sup>-3</sup> 1.39 x 10 <sup>-3</sup>	0.15 0.40
Burning Grounds								
MAXIMUM MINCMUM	S S	$(\underline{r})$	130 50	S1117 None	480 480	S1117 S1117	$1.04 \times 10^{-3}$ 1.04 x 10 <sup>-3</sup>	0.15 0.40
Nitroglycerine Pond								
MAXIMUM MINIMUM	SE SE	30 <0.1	1,140 2	S1124 None	8,620 37	S1119 S1124	5.2 x 10 <sup>-</sup> 4.9 x 10 <sup>-</sup>	0.15 0.40
Deterrent Burning Area								
MAXIMUM MINIMOM	SE SE	27 7	1,010 380	51122 Non <b>e</b>	8,620 8,620	S1122 S1122	4.63 x 10 <sup>-</sup> 4.63 x 10 <sup>-</sup>	0.15 0.40
Sanitary Landfill								
MAXIMUM MINIMUM	SE SE	27	1,010 380	3 None	8,620 8,620	S1122 S1122	4.63 x 10 <sup>-5</sup> 4.63 x 10 <sup>-5</sup>	0.15 0.40
Oleum Pond								
MAXIMUM	SE	13	510	None	37	s1130 & s1132	4.63 x 10 <sup>-</sup>	0.15
MINIMUM	SE		190	None	37	51130 & 51132	4.63 x 10 <sup></sup>	0.40
Ballistics Pond								
MAXIMUM MINIMUM	SS₩ SS₩	141 20	5,350 760	51127 & 51126* 51127	2,029 770	S1127 S1128	$1.04 \times 10^{-2}$ 1.04 × 10^{-2}	0.15 0.40

NOTE: \*Groundwater flow direction is not well defined in the vicinity of Well S1126.

#### SOURCE: OLEUM POND

The Oleum Pond was used for disposal of lime-neutralized sulfuric acid wastewater. This wastewater, therefore, contained significant concentrations of gypsum ( $CaSO_4.2H_2O$ ) which is moderately soluble in water. The sediment deposits in the Oleum Pond (now dry) are fairly extensive.

Table 8-1 indicates that the groundwater flow velocity in the vicinity of the Oleum Pond is very slow. It also indicates that the nearest down gradient well (S1132) is too far from the pond to detect any contamination originating at the pond. This was confirmed by the fact that sulfate in the water of Well S1132 is less than the detection limit of 6 mg/l. It can, therefore, be concluded that, if the sediments in the Oleum Pond are contributing sulfate to the groundwater, the contaminants are not migrating rapidly.

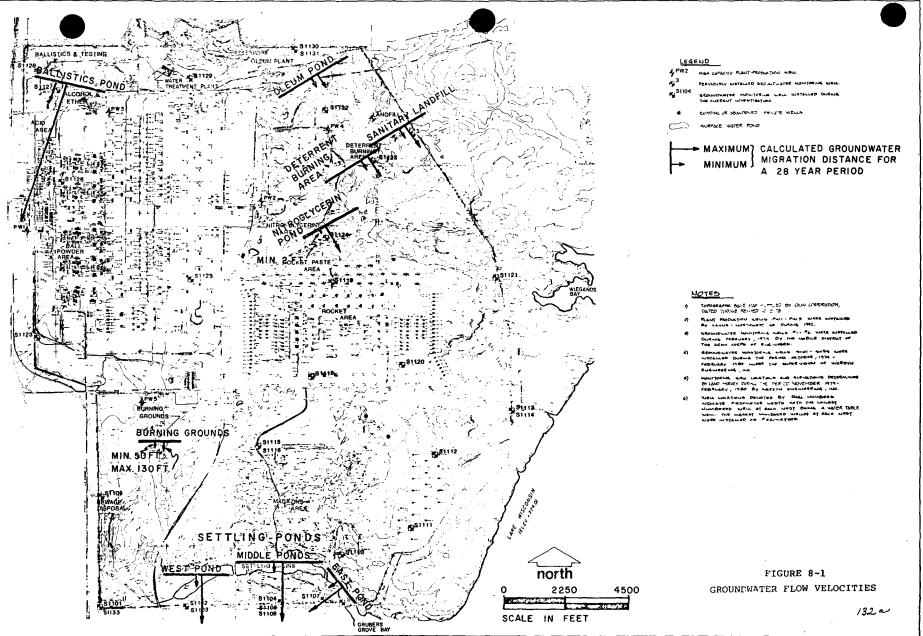
#### SOURCE: SANITARY LANDFILL

The sanitary landfill is located near the northeast corner of BAAP and is very close to the eastern boundary of the plant. As shown in Table 8-1, groundwater is flowing to the southeast in this vicinity at a rate of between 7 and 27 feet per year; "DNR" Well 3 (S1135) is possibly within the theoretical contaminant plume. "DNR" Well 2 (S1134) may also be within this theoretical plume.

Samples from Wells S1134 and S1135 contained elevated levels of COD, sulfate, hardness and iron, all classical indicators of landfill leachate. Fuel oil type compounds were also present. Little is known of the well installation and development procedures used for these wells, and some compounds and parameters (oils, COD, sulfate and hardness) may have been introduced during drilling, well installation, and/or initial development. The low yield of well S1134 prevented proper purging before sampling. Well S1135 was thoroughly purged before sampling and EEI believes that the sample from this well is more representative of ambient groundwater quality.

Because of the elevated levels of COD, sulfate, hardness and iron found in Well S1135, it can be concluded that the landfill is probably contributing contaminants to the groundwater and that these contaminants are very near (and moving toward) the boundary of BAAP.





#### SOURCE: DETERRENT BURNING AREA

The Deterrent Burning Area is located southwest of the Sanitary Landfill. Screening phase samples indicated the presence of DNT, diethyl and dibutyl phthalate (DEP and DBP) in the soils within the burning area. Table 8-1 indicates that Well S1122 is within the theoretical contaminant migration area around the burning ground. None of these compounds were present above the detection limits in the groundwater samples from Well S1122. Therefore, although they occur in the surface soils, they have not apparently migrated to the groundwater.

#### SOURCE: NITROGLYCERIN POND

Sediment samples from the nitroglycerin pond were collected at two different morphologic locations in the pond. The screening phase sample was a composite of subsamples collected near the edge of the pond. This composite sample contained a low concentration of nitroglycerin (S1404, sample number D5033). Sample number M0054 was collected from the center of the pond during the verification phase, and nitroglycerin was not detected in this sample. Therefore, it can be concluded that nitroglycerin is present in the sediments in the pond, but in localized deposits and in low concentrations.

Well S1124 is directly down gradient from the pond and is probably within the theoretical contaminant migration distance (Table 8-1). Geologic cross section G-G' in Chapter 3 (Figure 3-6) illustrates the relationship between the water table, the sandy till, the outwash, and the well screen in Well S1124. The maximum groundwater flow velocity shown in Table 8-1 is probably representative of flow in the outwash, and the minimum velocity is probably representative of the flow in the sandy till. The very top of the screen in Well S1124 is within the outwash whereas the rest of it is within the sandy till. The outwash is much more permeable than the till. As a result, water in the outwash is probably within the theoretical contaminant migration plume, whereas water in the till is probably Even though most of the screened section of Well S1124 not. is within the till, most of the water in the sample collected from the well probably came from the outwash due to its great permeability. This sample, therefore should be representative of water within the theoretical contaminant migration plume. It can be concluded that even though the sediments in the pond contain some nitroglycerin, it is not currently leaching into the groundwater.

# SOURCE: BURNING GROUNDS

The burning grounds are located in the southwest portion of BAAP. Groundwater in this area is moving slowly through a very thick section of moderately to highly permeable outwash deposits. Table 8-1 indicates a flow velocity of between one and three feet per year. Well Slll7 may, therefore, be within the theoretical contaminant migration distance from the burning grounds.

Carbon tetrachloride and chloroform were detected in samples from Well Slll7 in both screening and verification phases. These compounds were commonly used as industrial solvents before their toxicity was fully recognized and could probably have been used at BAAP. Flammable liquids are commonly used as combustion aids at the burning grounds. Although carbon tetrachloride and chloroform are not flammable, it is hypothesized that they may have at one time been inadvertently mixed with flammable waste solvents and the mixture used as a combustion aid at the burning grounds. Because of their high specific gravity and inflammability, if used in one of the burning pits, they would have readily soaked into the ground. Less than one gallon of each compound would have been more than enough to account for the concentrations found in the samples from Well Slll7. Therefore, it can be concluded that groundwater in the vicinity of Well Slll7 has been contaminanted with chloroform and carbon tetrachloride, which probably originated from their use at the burning grounds.

Several other compounds of concern, both organic and inorganic, were detected in high concentrations in soil samples at the burnings grounds. These include DEP, DBP, DNT, diphenylamine, nitrodiphenylamine, lead and tin. None of these compounds were detected in the samples from Well S1117. Therefore it can be concluded that these compounds, if leaching at all, have not yet migrated the short distance (less than 200 feet) from the burning ground to Well S1117.

# SOURCE: ROCKET/PASTE AREA

The Main Central Drainageway consists of a series of ditches which drain runoff from the Rocket/Paste Area of BAAP south to the middle of settling pond number 3 (Figure 8-1). Several soil samples were collected from along this drainageway. Three of these, S1408, S1409 and S1415, were analyzed for the presence of lead. The lead content of the soil sample from Site S1408 was over 1,000 ppm. Lead contents at Sites S1409 and S1415 were less than 100 ppm (background). Lead concentrations in soil of over 600 ppm are considered excessive based on the phytoxicology guidelines published by the Ontario Ministry of the Environment (1).

Therefore, it can be concluded that significant lead contamination has occurred in the soils in the ditches at some locations within the manufacturing areas. It can also be concluded that, since samples at Sites S1409 and S1415 contained only background concentrations of lead, contamination has not migrated throughout the entire system of ditches.

#### SOURCE: WASTEWATER TREATMENT PLANT

The wastewater treatment plants (industrial and sanitary) are located in the southwest area of BAAP (Figure 8-1). The discharges from these plants empty into an unlined drainage ditch which flows south and east into the settling ponds. Two sampling sites, S1413 and S1414, were located along this ditch (Figure 8-1).

The sediments in this ditch contain significant concentrations of nitrocellulose, lead, sulfate, DNTs, DPA, DEP and DBP. The water flowing in the ditch contains very low concentrations of commonly used agricultural pesticides.

The ditch does not cover a large area. Sulfate is the only contaminant found in the sediment that is readily leachable. Well S1133 is down gradient from the upper portion of the ditch, and the ditch passes close enough to this well to be within the theoretical contaminant migration distance. Since the sulfate concentration in the sample from Well S1133 is less than the background level (from Well S1123), it can be concluded that contaminants found in the sediments in the ditch have not presently contaminated the groundwater and are not a significant potential source of groundwater contamination. The pesticides found in the water in the ditch are probably the result of agricultural runoff and were not at a high enough concentration to represent a threat to groundwater quality.

#### SOURCE: SETTLING PONDS

The settling ponds located along the southern boundary of BAAP received the industrial wastewater flow from manufacturing operations. The sediments and underlying soils within these ponds (now dry) were sampled.

The sediments from most areas of the ponds have been removed from the ponds through a combination of draglining and bulldozing operations. Samples of the sediments from both the perimeter and interior areas contain high (percent to high parts per million range) concentrations of nitrocellulose, DNT, phthalates and sulfate. The concentrations of these parameters decrease rapidly in the underlying soils and are less than (or approach) the detection limits within a depth of 30 feet.

The water table is below the bottom of these dry ponds, at a depth of between 10 and 45 feet. Groundwater flow is generally to the south. Most of the monitoring wells along the southern boundary of BAAP (S1102-S1108) are probably within the theoretical contaminant migration distance (Table 8-1) from the settling ponds. DNT was not detected in samples from these wells and nitrates, nitrites and sulfates were all at or below background concentrations. DEP was detected at 8 ug/l in Well S1107, but the significance of this concentration is questionable. Therefore, the following conclusions can be reached.

Contaminants, which are present at high concentrations in the sediments in and around the settling ponds, have not contaminated groundwater along the southern boundary (exit point) of BAAP and probably have not yet been leached into the groundwater directly beneath the ponds. However, some vertical (downward) migration of the contaminants seems to have occurred within the soils above the water table.

The sediments in Grubers Grove Bay (receiving body for the wastewater discharge from the ponds) contain very high (up to 17 percent by dry weight) concentrations of nitrocellulose. The nitrocellulose has apparently been decomposing and forming ammonia, as evidenced by high ammonia concentrations in the sediments.

Because Lake Wisconsin is a man-made lake and the dam which creates the lake is near the southern boundary of BAAP, water from Grubers Grove Bay is flowing down through the sediments and recharging groundwater. Flow within the groundwater flow system is toward the south-southwest. Although no wells outside of the BAAP boundaries were installed or sampled as part of this survey, it seems probable that ammonia from sediments in the bay may be leaching into the groundwater. No reliable estimate of the potential rate of movement or concentration of the possible contaminants can be made based on the results of this survey. However, it should be noted that the apparent hydraulic gradient (the driving force) in the groundwater in the vicinity of the bay is greater than in most of the areas at BAAP. Dredging to remove these sediments from the bay has been considered. The high ammonia content of the sediments would make this operation undesirable since the ammonia would then be released into Lake Wisconsin via the return flow from the dredge. The return flow could be treated to remove the ammonia, but this would be an extremely costly procedure.

Two categories of compounds were found in the perch and carp samples which most probably did not originate at BAAP but which are cause for some concern. Both pentachlorophenol and several of the polynuclear aromatic hydrocarbons were found in both the carp and the perch. They were present only in trace amounts in the perch, but in higher concentrations in the carp.

#### REFERENCES

(1) Linzon, S. N. et al. 1976. "Lead Contamination of Urban Soils and Vegetation by Emissions from Secondary Lead Industries" in JAPCA, 26:7, July.

# APPENDIX A

IR DATA CODE ADDITIONS OR CHANGES

Variable	Columns	New Code	Description
Chemical Analy	sis File:		
Site Type	16-19	BAY	bay of water
Lab	40-41	EE WZ AC	Envirodyne Engineers Warzyn Engineering Ace Well Drilling Company
Test Name	48-53	SN CEC TXPHEN BBHC ABHC DBHC AENSLF BENSLF PCB016 PCB221 PCB232 PCB242 PCB242 PCB248 PCB254 PCB254 PCB250 SULFID NI TL	tin cation exchange capacity toxaphene beta-BHC alpha-BHC delta-BHC alpha-endosulfan beta-endosulfan PCB 1016 PCB 1221 PCB 1222 PCB 1242 PCB 1242 PCB 1248 PCB 1254 PCB 1254 PCB 1260 sulfide nickel thallium
Measurement Units	66-69	MEQG	milliequivelants per 100 grams
Ecological Mon	itoring Fi	le:	
Site Type	16-19	BAY	bay of water
Genus-Species	31-36	QUEMAC POPDEL CORSTO MORRUB GRASS RHUTYP STICAN STIVIT LEPMIC MORCHR ICTNEB ACIFUL POMANN CATCOM AMBRUP	Quercus macrocarpa Populus deltoides Cornus stolonifera Morus rubrum mixed grasses Rhus typhina Stizostedion canadense Stizostedion vitreum Lepomis microlophus Morone chrysops Ictalurus nebulosus Acipenser fulvescens Pomoxis annularis Catostomus commersoni Ambloplites rupestris

-

•

Variable	<u>Columns</u>	New Code	Description			
Map File:						
Site Type	8-11	BAY	bay of water			
Physical Analysis File:						
Site Type	8-11	BORE	bay of water			
Lab	<b>49-</b> 50	EE WZ AC	Envirodyne Engineers Warzyn Engineering Ace Well Drilling Company			
Test Name	51-55	G001 G003	Grain size, hydrometer, % finer than 0.001 mm Grain size, hydrometer,			
		G006	<pre>% finer than 0.003 mm Grain size, hydrometer, % finer than 0.006 mm</pre>			
		G009	Grain size, hydrometer, % finer than 0.009 mm			
		G020	Grain size, hydrometer, % finer than 0.02 mm			
		G030	Grain size, hydrometer, % finer than 0.03 mm			
		GS020	Grain size, No. 2 sieve, % finer			

.

# APPENDIX B COMPOSITE SAMPLE NUMBERS

Site ID	Composite Sample Number	Sample Numbers <sup>.</sup> Contained in Composite
S1301	D5036C	M0005 D5034 D5035
S1302	D5039C	M0006 D5037 D5038
S1303	D5042C	M0007 M0008 M0009 D5040 D5041
S1304	D5045C	M0010 M0011 D5043 D5044
S1305	D5048C	M0012 D5046 D5047
S1306	D5051C	M0013 M0014 D5049 D5050
S1307	D5054C	M0015 M0016 D5052 D5053
S1308	D5057C	D5055 D5056
S1309	D5060C	D5058 D5059
S1310	D5063C	D5061 D5062
S1311	D5066C	D5064 D5065
S1312	D5069C	D5067 D5068

-

•

•

.

. .

. !

Site ID	Composite Sample Number	Sample Numbers Contained in Composite
S1204	D5024C	D5024 <sub>}</sub> for 24DNT analysis D5025 <sup>}</sup> only
S1201	D5019L (lower parent) D5019U (upper parent)	D5019 separated for DBP, DEP and 24DNT analysis (sample D5019 was in different bottles originally, by horizon)
S1202	D5020U (upper parent) D5020S (sediment)	D5020 for 24DNT, DBP and DEP analysis (originally in separate jar)
S1303	M0789C	M0007 for various M0008} physical/chemical M0009 analyses
S1303	D5141	D5041 for various physical/chemical analyses
S1304	M1011C	M0011 for various M0010 <sup>}</sup> physical/chemical analyses
S1306	M1013C	M0013 for various M0014 physical/chemical analyses
S1308	D5156	D5056 for various physical/chemical analyses

•

.

•

e • 1

. .

## APPENDIX C

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS GEOTECHNICAL-MAP FILE

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS-DEDTECHNICAL-MAP FILE

GEN	5 PL	N	CH
1	2	Б_	_7_
1183	FA	T	FIL
E A	SB	ſ.	MA
		e-C	

SITE       ORID COORDINATES       ORID COORDI	1	8	12	22	32	42	52	62	84	87
		1						9C	DESCRIPTION	C
		IYPE	IDENTIFICATION	ERST HORTH	EEST NORTH	EAST NORTH	EABT NORTH			44
		] 		 			 			
		1			1			Ι.	1	
		- <b>-</b> - <b>-</b> - <b>-</b>		<u>┥╶╃╶┹╌┹╴╀╌╉╌╂╶╂╶</u> ╉╌┹╴	┥╍┺╺┺╺┺╺┺╺┺╼┸╼ ┆					Π
			· · · · · · · · · · · · · · · · · · ·	<b>╡╶╀╌╀╶╂┈╀╌╗╶╋╌╀╶╂╶╀</b>	<b>····</b>	<u></u>	<mark>╞╺┷╼╛╺┙╸╸╸╸╸╸</mark>	-*-	<u></u>	+
				<u> </u>	<u></u>			Ļ	<u></u>	╇
								<b>!</b> .		
						1				Τ
		<b>↓</b>	<mark>┥╶╌┩╴╇╴┺╌┞┈┖╶┚╓┺╼┺╸</mark> ┶┈ ╎	<mark>╡╶┻╴┻╴┹╼┸╌┻┉┖╴┹╶┸┯┻┈</mark>	<mark>╎╶┶╌┞╌┖╶┖╶┹┈┶╌┶╶┸╶┹</mark> ╌	<mark>┟╴╄┉╇╴╉┉┹╾┹╼┖╌╃╶┖╶┖╴</mark>	<mark>┨╴┡╶┚╼┡╌┚┈┹╶┞╶┡╌┡╌┻╶</mark> ┨	<u> </u> -	<mark>┟┈╽┈╽┈╽┈╽┈╽╶┟╶╽╶╿╶╿╶╽╶╽╶╽╴┥╸┥</mark> ╸┩╌┩╴	+
			<mark>──╄╼╧╌╄╌┷╴╆┈┻╌┻╶┷╴</mark> ┷	<u><u></u> <u></u> </u>		<u><u></u><u></u></u>	····	1	<mark>╞╶<sub>┻╴</sub>┇╷<sub>╋┍</sub>╋╷╋╷╋╷╋╷╋╷╋╶╋╺╋╺╋╸╋┉╋╸</mark>	╇
	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · ·			 		<u> </u>	
									1	
				<u> </u>	<mark>┼╶┼╌┨┈┨┈┨┈┨┈┨╶┨╶┨╶</mark> ┨╴ ┆	<u>↓</u> ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	<mark>╡╌┛╴╀╶┛╌┚┈┖┈╃╶┹</mark> ╌ <mark>┹╌┦</mark> ┈ ╎	$\uparrow$	<mark>╡╶╶┦╴┥</mark> ╼╄╼┺╼┺╼╋╼╊╼╋╼╋╼╋╼╋╼╋	t
				<u> </u>	<mark>┤┈┺┉┺╌┹╌┹╶┹╌┻╶┻╶┻</mark> ┈	<u>┤╶┶╼┻╼┹╼┹╼┹╼┹</u> ╼┻╼	<del>╡╺┥╺┥╺┥╺┥╺┥╺┥╺┥</del>		<mark>╡╶╘╶╛╶╛╶┙╴┧╶┪╴┥╶┥╴┥╶┥╴┥╴┥╴┥╴┥╴</mark>	╋
			· Josh of a local state				· · · · · · · · · · · · · · · · · · ·		<u></u>	∔
								Ι.		
										Τ
		-1-1-		┟╺┺╼╄╾┦┯┹┉┺╌╄╾╂╼┞╾	<mark>┟╌┟╼┶╌┶╌┩╶┦╴┦╸╿╶┨</mark> ╶┠	<mark>╎╶╡╌┫┈┫┈┫╶┫╴┫╴┥╴┥</mark> ┈┦┄╴ ╽	<mark>┠╶╄┉┠┈╃╴┚╶╇┯╀╴┹╶┺╼┹┈</mark> ╎	╉╼┷╍	<mark>┦╶┛╌┶╶┚╶┖╶┹┈┥╼╇╌╇╌╇╾╇╌╅╷┾╴┦┈╃╾</mark> ╄╸ ╿	+
				┟╺┺╼┺╼┺╼┺╼┺╼╄╼	<mark>┝╶┶╴╇┉┽╴╃╌╇╼╄╌╄╴</mark> ╋╌╄╸	<u></u>	<u></u> <del>╶╶╘╶╘╶╘╶╘╶╘╶</del> ┺╌	<u>  .</u>	<u><u></u></u>	+
			╾┻╾┖╌╃╌┶╴┫╖┩╼╂╖┫╼┫╼	<u>┟╶┹╾┹╾┹╶┹╌┹╌┹╼┹╼</u> ┻╼	┟╴┽╌╡┈┞╴┽╴┽╌┽╌┽╶┥╴┥╴	<u>┥╴┹╌┺╌┺╌┺╌┹╌┹╶┹╶</u> ┻╌╴		┟╾┸╼	<mark>╡╶╘╶╘╶╘╶╘╶╘╶╛</mark> ┙┛╺┖┈┟╌┠╌┡╌┡╌╄╶┶╌┻╴	T
		┝─┸╼┹╼╋		<del>╡╺╴┸╶┛╺┙╺╸╸╸╸╸╸</del>	<mark>╡╶╝╌┷╴┷╶┹╶┹╶┹╶┹╶┹</mark> ╌	<mark>┆╶╕╺╅╶┫╶┫╶┫╶┫╶┫╶┛╶┙</mark> ╿	<u></u>	┝┷	<u><u></u><u></u></u>	╋
					<u></u>	_ <b></b>			<u></u>	╇
										Τ

INS = INGTALLATION FR = FUNCTIONAL AREA T = CATA TYPE FIL = DATA FILE

AC = ACCURACY CODE CN = CARD NUMBER

REVISED 1-78 CDIR Form 13-4.3, 1 Sep 78

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - MAP FILE

#### Variable

#### Description

Plant/File

#### 1.-4. Identification (Col. 1-7)

-

5. Site Type (Col. 8-11) 4 letter abbreviation of type of landmark, feature, or construction being identified. This description/identification will have grid coordinates associated with it.

#### Possible Entries

#### BASAGMA

AREA (area of land portion of a site) BASE (basic map of installation boundaries and landmarks) BASN (basin) BLDG (building) BLUF (bluff) BNCH (site benchmark) BORE (borehole) CREK (creek) DTCH (ditch, drainage) FELD (field) FENC (fence) ISLE (island) LAKE MAXP (maximum X and Y of installation) PENI (peninsula) PIT (pit-tree, spad PLUG (shovel sample) (pit-tree, spade) POND PPLT (pilot plant) ROAD (railroad) RR RVER (river) SILO SMPT (sample point) STRM (stream) STWA (standing water) SURF (surface-general) SURW (surface-water) TANK (storage tank) TWER (tower) WASS (solid waste) WASW (waste water) WELL. S0001 thru S0999 S1000 thru S1999 00000 thru 99999

S0 thru S9 or M0 thru M9

 Sample Point (Col. 12-16)

7. Grid Location(s) (Col. 22-61)

8. Accuracy (Col. 62-63)

9. Description (Col. 64-79)

10. Card Number (Col. 80) Hydrogeology East coordinate North coordinate

Biology

2 character abbreviation to indicate measurement accuracy as follows: one (1) alpha character S = surveyed M = read from MAP one (1) numeric character 0 = 1 meter 1 = 10 meters 2 = 100 meters

3 = 1000 meters

Sixteen (16) characters, letters or numbers, used to better describe the landmark (site type) located by the entry.

One (1) number used when multiple cards are needed.

1 thru 9

	Site ID <sup>(a)</sup>	Description
•	S0019	North of and downgrade from the Oleum plant, stressed.
	S0020	West side of burning area off waste powder pads 1 and 2, not cited.
	S0021	East side of burning area next to debagger pit 2 and wet plate burner, not cited.
	S0022	Rocket ditch, east drainage, low area, stressed.
	S0023	East-central area of plant on high ground, BKG, healthy.
	S0024	West of Oleum plant, sulfur pad runoff, not cited.
	S0025	Northwest corner of plant, fishing area, moisture stress.
	S0026	North-central part of plant, stress from wind exposure.
	S0027	Southeast part of plant, north of settling ponds, high ground, BKG, healthy.
	S0028	Railroad tracks south of Oleum plant, drought stress.
	S0029	2,000 feet northeast of burning ground, moisture stress.
	S0030	Central part of plant, levee area, stress from uprooting.
	S0031	North part of plant west of water reservoirs, stress from exposure or air pollution.
	S0032	Northeast of plant, acid pond area, not cited.
	S0033	North-central part of plant, open field, BKG, healthy.
	S0034	North part of the plant, north of water reservoirs, BKG, healthy.
	S0035	North-central edge of plant, BKG, healthy.
	S0036	Central part of plant, BKG, healthy.
	S0037	Northeast of burning ground, healthy.
	NOTES: (a	) Last character to the right in the description field refers to the citation in the infrared photo- interpretation report.

.

ł

## Detailed Map File Descriptions for Biology - Site IDs S0001 through S0037

Site ID<sup>(a)</sup> Description

- S0001 South side of settling ponds, inflow from process sewer, stressed.
- S0002 South side of settling ponds downgrade from S0001, stressed.
- S0003 South side of settling ponds downgrade from S0002, stressed.
- S0004 North side of settling ponds downgrade from S0001, stressed.
- S0005 North side of settling ponds, midway down group of of ponds, inflow from process sewer and rocket area drainage, stressed.
- S0006 Rocket ditch drainage just upgrade from S0005, stressed.
- S0007 Borrow pit downgrade from S0005, stressed.
- S0008 South side of settling ponds downgrade from S0003, stressed.
- S0009 North side of settling ponds at southeast corner of plant near outflow to Wiegands Bay, stressed.
- S0010 Nitro pond area; inflow to ponded area, stressed.
- S0011 Nitro pond area; ponded area itself, not cited.
- S0012 150 feet below process sewer outfall, not cited.
- S0013 500 feet below process sewer outfall, not cited.
- S0014 Rocket area ditch on north end, not cited.
- S0015 Rocket area ditch downgrade from S14 in bunker area, not cited.
- S0016 Deterrent burning pit, stressed.
- S0017 North central edge of plant, BKG, healthy.
- S0018 Old landfill east of the deterrent burning pit, stressed.

## APPENDIX D

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS ECOLOGICAL SURVEY-MONITORING PROGRAM

## INSTALLATION RESTORATION

SAMPLING AND ANALYSIS ECOLOGICAL SURVEY-MONITORING PROGRAM

GENG PUNCH

1	3	5_	7
INS	FR	T	FIL
29	SH	-	MP
		-	

1	9	13	16	20	30				39						56	59	63	66		73	78 80
	SAMPLE	ces	SITE	SITE	T	DENUS	SPEC-	TI	R E	CP	P	COLOR	DEPTH	AREA/	NR.	HEIGHT				COMPORTIE	STAT
·	DF TE		TYPE	IDENTIFICATION	X		IES	44	막다	1	н			VOLUME	SPEC	L	SUE	5	NUMBER	SADPLE M	12225
									11					1	1	1				· · ·	
					Π			Ħ		+	Π				<b></b>		T	Π			
	· · · · · · · · · · · · · · · · · · ·	┝╼╼┤			H		<u> </u>	┢╌╟╸	+	+	Н			<u> </u>	<mark>∤₋ℯ</mark> ℯℯ	┤╌╾╾	┥╾╾	4-1			┟╍╍┨
														Lini		Lu				_ ب ب ب ب	
																					1 1
		┥┻╺┶╌┥		<u></u> <u></u> <u></u>	Η		- <u>i-</u> i-	H	++	+-	d		┝╍┸╼┸╼┸┉	┨╌┹╼┹╾╇╌┺╌┺╴	┨╌┻╌┻╌		┥╌┻╌┻╌		<u> </u>		<del>╡╺╸╺</del> ┥
		┝┹┹┥		┇ <mark>╴╶╢╴╢┈╫┈┽╶┥╶┥╶┥╶┥╴</mark> ┥	Н		<u> </u>	┥┥	++	4-	H	<b></b>		<u></u>	<del>∤.ı.ı</del>	┠┹┹┹		$\left  \right $		fra.	
														1		1	L				ليبا
					Π			П		Τ	Π										
				<mark>┩╶┶╶╃┈╇╶╇╶┿╶╄╶╄╶┩╶┩┈┩╴</mark>	Н			++	+ +		Η			1-1-1-1-1-	┼╍┷			1-	┟╍┸╺┹╌┛╌┛╌┛╌	┨╍┹╍┹╍┹╍	
	منابع المحاصل			<mark>│↓↓↓↓</mark>	$\left  \cdot \right $			┨-┣	++			-4-4-		<u></u>	<u> </u>	┟┷┷┷	+	+-			
			. المراس الت											1		L	1				
					Π			П		Τ	Γ					1					
	- <del></del>		. A. A.	<mark>╡╶┛┈┺╶┦╶┺╌┨<mark>┈┺┈┧┈┺╶</mark>┺╌ ╎</mark>	H			╉╋	$\mathbf{H}$	+	H		-1-4-4-	<u>┥</u> ┺┺┺┺┻┻	$+ \cdot \cdot$	<del>┨╺┸╺┻╸┹</del>	+	+	<u></u>		<del>{╶┺╼┺╶</del> ┨
	-	L			Ц		- <b>-</b>	H	$\downarrow$	4	1-1			fine	fre	+	++++	$\downarrow$	[		
															1					<b></b>	
					Π			Π	Π	T	Π			1		1		Τ			
				<b>╶╴┦╶╴┦╶┑┦╌┑┨╶╸┫╶╶┨╶╶┩╶╶┩</b>	Н		-	┝┼	++		┨┥		┝╼┹╼┹╼	<del>╞╶╘╺╡┈╡╶╡</del>	┼╌┵	┨┛╼┹╼┹	┟╍┻╼┶╼	+-		$ \begin{bmatrix} \mathbf{A}_{\mathbf{A}} & \mathbf{A}_{\mathbf{A}} \end{bmatrix} $	┼┹┹┥
	<u> </u>		<b></b>	<mark>────────────────────────</mark>			<u> </u>		$\downarrow$							<u>L</u>	1	ļ			
							• •							1							
					H		-	t t	11	+-	Н		╎		+	+	+++++	┮			+
			┝╍╇╍╄╍	╌╽╌╽╌╽╌╽╶╽╶	$\left  \cdot \right $	┈╄╼┹╼╞	الا	++	┽┽		$\left  \right $			<del>↓↓↓↓</del> ↓	┟╍╍	<b>├</b>	┽┷┶	╀	┟╌┹┉┺╌┻╼┻╴		$  \dots  $
											$\square$			hum		Lui			Lui		
					Π	T		IT	$\prod$	T	Π										
	<del> </del>			<u>╶╶Ă⋰┡╴</u> ╇ <u>─</u> ╄ <u>─</u> ╄ <u></u> ─╄ <u>─</u> ╄ <u></u>	H			╞┼╴	╈	+	t-†			┟╌┟╌┟╌┥┈┥┈	╞╍┺╍	<del>┨╴┖╺┻╺┺</del> ╍	+-+-+-		<u>╞</u> ┯┻ <u>┈</u> ╄┈┹ <u></u> ┺ <u></u> ┺	╏╌┖╌┵╺┶╺┶	
					$\square$			H	+	+	$\downarrow$				┟┹┹╴	<u>L</u>	+	$\downarrow$			hard
														1							

INS = INSTALLATION FA = FUNCTIONAL AREA I = DATA TYPE FIL = DHTA FILE 03S = DBSERVER

~

.

TL = TAXON LEVEL AG = AGE CODE EC = ECTOPARASITE TX = TAXON NR = NUMBER

. . . . . . . . . . . .

C = CONDITION P I = PLANI TYPE PH = PHEMOLOOY S S = SAMPLE SUBPROGRAM

REVISED 1-78

.

CDIR Form 13-3.6, 1 Sep 78

. . . . . . . . .

#### SAMPLING AND ANALYSIS ECOLOGICAL SURVEY - MONITORING PROGRAM

#### Variable

- 1.-4. Identification (Col. 1-7)
- Sample Data 5. (Col. 8-12)
- Observer (OBS) 6. (Col. 13-15)

7. Site Type (Col. 16-19)

	Description	Possible Entries
n ł	lant/File	BASAEMP
	i digit Julian date sample s taken.	79274 thru 79365 80001 thru 80090
i	letter initials of ndividual responsible for sampling.	AAA-222
4	characters:	
1	General Area - 1 letter used to indicate the stratum from which data was collected.	A-Z NOTE: Enter X if not applicable
. <b>B</b>	Habitat - 2 or 3 letter code describing the dominant habitation characteristic	Field Areas BF (bare field) CF (corn field) SF (sorghum field) WF (wheat field) OF (other field crop) CR (commercial/residents area) IA (industrial area) PL (planted lawn) Prairie Vegetation Areas BG (blue gramma) CW (crested wheat)

- CW (crested wheat)
- NT (needle-&-thread)
- RT (red threeawn)
- (sand dropseed) SD WT
- (weedy type) (western wheat) WW

#### Wet Areas

- сc (creek or canal)
- LK (lake) MT
- (marshy type) PD (pond)

#### Woodland Vegetation Area

- CD (coniferous - deciduous woodland)
- CN (coniferous woodland)
- DW (deciduous woodland)
- LT (locust thicket)

#### Combination Areas (XX Selected from Above List)

- BXX (shrubs w/xx) CXX (coniferous woodland surrounded by XX)
- DXX (deciduous woodland surrounded by XX) EXX (conferous-deciduous woodland
- surrounded by XX) LXX (locust thicket surrounded by
- XX)
- Nxx (3 or less coniferous trees w/xx)
- Pxx (prairie dog town w/xx) Rxx (rabbitbrush w/xx)

- Sxx (sagebrush w/xx) Txx (3 or less deciduous trees W/xx)
- Yxx (yucca w/xx)

### SAMPLING AND ANALYSIS ECOLOGICAL SURVEY - MONITORING PROGRAM (Continued)

	Variable	Description	Possible Entries
8.	Sampling Point	Biology	50001 thru 50999
9.	Taxon (TX) (Col. 30)	l letter designation for Taxon that contains the observed organism (animals only)	<pre>A (amphibian) B (bird) F (fish) I (invertebrate) M (mammal) R (reptile) P (plant)</pre>
10.	Genus (Col. 31-33)	3 letters denoting the genus. Refer.to species note below.	See Appendix A Temporary species code used until proper identification.
11.	Species (Col. 34-36)	3 letters denoting the species. NOTE: If a Genus and/or species is not identified at the time of sampling, then enter a 3 digit random number for each entry that is unknown. These 3 digit numbers will be used to find a specific unknown entry should the Genus and/or Species become known at a later date.	See Appendix A
12.	Taxon Level (TL) (Col. 37)	l letter abbreviation indi- cating the taxon level to which a 3 letter entry in the species column refers. When the genus and species is indicated in the Species column. Taxon column will be blank.	F (family) O (order) C (class) BLANK
13.	Age (AG) (Col. 38)	l letter abbreviation indicating the relative age of the animal specimen.	J (juvenile) A (adult) BLANK (if plant)
14.	ECTO (EC) (Col. 39)	<pre>l letter abbreviation de- noting the relative number of ectoparasites obtained from a bird or mammal specimen (animal only).</pre>	N (none) F (few) M (many) BLANK (if plant)
15.	Condition (C) (Col. 40)	l digit number denoting the condition of the plant or animal specimen.	<pre>1 (normal) 2 (stunted) 3 (wilted [plants only]) 4 (robust (plants only]) 5 (sick [animals only]) 6 (dead) 7 (unknown)</pre>
16.	Plant Type (PT) (Col. 41)	l digit number denoting the type of plant the specimen is (plants only).	<pre>1 (annual) 2 (biannual) 3 (perennial) 4 (aquatic) 5 (mix of annual and perennial) HLANK (for animals)</pre>

BLANK (for animals)

-

## SAMPLING AND ANALYSIS ECOLOGICAL SURVEY - MONITORING PROGRAM (Continued)

Variable

i

•

### Description

### Possible Entries

-

17.	Phenology (PH) (Col. 42)	2 digit number denoting the phenology of the plant spe- cimen (plants only).	<pre>1 (first visible growth) 2 (first leaves fully expanded) 3 (floral buds developing) 4 (mature floral buds or open     flowers) 5 (green or ripe fruit) 6 (dispensing seeds) 7 (beginning dormancy) 8 (fall growth [winter annuals]) 9 (winter dormancy) 0 (standing dead) BLANK</pre>
18.	Color (Col. 43-45)	3 digits indicating the color of a plant specimen (plants only).	See appendix for codes BLANK (for animals) See Appendix C
19.	Depth (Col. 46-49)	4 numeric or alpha-numeric characters denoting the depth of the sample. The 4 digits will indicate the average depth, in centi- meters, at which the sample was obtained. In the case of root samples, alphabetic X (in position 49) will denote the roots emerged from the soil plug at the depth, in centimeters, indi- cated by the first 3 numeric digits.	0001 thru 9999 001X thru 000X BLANK
20.	Area/Volume (Col. 50-55)	6 digits indicating the volume in cubic centimeters or 5 digits followed by alphabetic A indicating the area in square centimeters of the space sampled.	00001A thru 00000A 000001 thru 999999
21.	NR Spec (Col. 56-58)	3 digit number indicating the number of specimens making up the sample.	001 thru 999
22.	Weight (Col. 59-62)	4 digit number indicating the weight (in grams) of the sample preparation.	0001 thru 9999
23.	Tisșue (Col. 63-65)	3 character field used to denote the type of plant or animal tissue the sample contains.	<pre>BEA (beak) BEF (beak and feet [including legs]) BLO (blood) BOF (body fat) BRA (brain) FAT (visceral and body fat) FEA (feathers) FEE (feet) FIL (filet) FLO (flowers) FRU (fruit) HAU (femurs and humeri) HAI (heir) HEA (heart) HXA (hexane-acetone rinse [50%]) INT (internal organs [heart, liver, lungs, spleen and kidneys]) KID (kidney) LEA (leaves) LEG (legs)</pre>

## TABLE H-1

## SUMMARY OF VEGETATION SAMPLING

Sampling Area(a)	Corresponding IR Site No.	IR Citation	
1	None	None	Treatment outfall ditch
2	1,2	Stressed	Settling ponds/treatment outfall ditch
3	None	None	Rocket ditch
4	3,4,5,6	Stressed	Settling ponds/rocket ditch
5	12.1	Stressed	Rocket ditch
6	9.2	Healthy	No probable stress-BKG
7	14	None	Burning ground
8	14.1	Healthy	NE of brng. grdBKG
9	13.4	Healthy	BKG near center of site
10	24.1	Stress from uprooting	Made land-uprooting on levee
11	None	None	Higher ground near center of site-BKG
12	26.1	Stressed	Nitro pond
13	27C.2	Stressed	Deterrent burning pit
14	27C.4	Stress from wind	Wind stress
15	27D.1	Stressed	Old landfill
16	21.4	Drought stress	Drought stress
17	21.1	Healthy	BKG
18	29.5	Stressed	Downgrade from oleum plant
19	None	None	Oleum plant pad runoff
20	None	None	Downgrade from acid pond
21	20.2	Stress from air pollution or exposure	
22	29	Healthy	No probable stress
23	19	Moisture stress-drowned trees	Moisure stress
	<b>`</b>		

NOTES: (a) For sampling areas refer to Figure 3-6.

1

## ANALYTICAL DATA SUMMARIZED BY SITE TYPE

TTE TYPE: WELLS

` **v** 

.

- N

•

i.

	· WELLS											
	SITE IDENTIF) ATION	SAMPLE NUMBER	SAMFLE DEFTH	SAMPLING DATE	ANALYSIS DATE	PARAMETER TEST NAME		MNTSA	EXF			
	. memoran i tanar	2.2.2.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	<b>22 21</b> 1. L. L.	********	*******	********	22127	zzereze	v 2005			*****
	<b>C11</b> 00	A4-04-1	1370	80051	80084	AL		2.500	+03	UGL		
	S1102	A0001		80051	80056	20%	LT	2.500	-01	MGL		
	S1102	60001	13"0		80038	N02 N03	<b>C</b> 1	1.600	+01	MGL	-10	2
	S1102	ACC 01	1370	80051					+00			8
	S110-	40001	1320	80051	80084	F'B		9.600		UGL	-0.4	0
	\$1107	400.0 <b>1</b>	1370	80051	80084	SN	LT	1.800	+01	UGL		
	\$1107	A0001	1320	80051	80059	S04		1.420	+02	MGL	42	2
	51107	1090 B.C	1674	30183	80225	AG	LT	3.000	+00	UGL		
	\$110.2	ACCOS	1574	80183	80197	ALDEN	i, T	3.300	-02	UGL		
	51102	60006	1674	80183	80225	AS	LT	5.000	+00	UGL		
	51102	AP066 .	1674	80183	80197	FCE016	LĪ	1.100	+00	UGL		
				20107	004.33	668001	. •	7 000				
	S110.	63004	1674	80183	80197	FCB221	LT	3.000	+00	UGL		
	\$1102	FUDGE	1574	80183	80197	PCE232	LT	2.400		UGL		
	S1101	50466	1674	80193	80197	FCB242	£Τ	1.306	+00	UGL		
	31102	A-004 e	1674	80183	80197	FC8248	LT	7.000	-01	UGL		
	S1162	AU065	1674	80183	80197	FCB254	LT	2.400	+00	UGL		
	S1102	60056	1674	80183	80197	FCB260	LT	2.300	+00	UGL		
	51102	60000	1674	80183	80225	BE	LT	4.700	+01	UGL		
	S1102 S110?	60946	1674	80183	80197	ABHC	Ē.T	1.700	-01	UGL		
	51102	A Sec	1674	80183	80197	BEHC	LI	3.500	-02	UGL		
	51101	H 2000 20100	16 4	80183	20197	DBHC	E I	2.600	-02	UGL		
	51101	2011 ISBN 0	10 4	60165	20177	LENC		2.000	J 4-	0.00		
	\$1192	6-035	1674	80133	80197	CCL4	LI	3.000	+ 01	UGL		
	51102	10:055	1574	80183	80225	CD	Lī	1.000	+00	UGL		
	S1102	AGUSA	1674	80183	80197	CHCL3	LT	2,300	+00	UGL		
	51102	60.06.6	15/4	80183	80197	CLEAN	L1	1.100	-01	UGL		
	S1101	50-565	1674	80183	60225	UR.	LT	4.000	+00	UGL		
·	<b>D</b> • 1 • 5 •			00100	80225	солот		3.400	791	UGL		
	S110.2	Acres	16.14	80193						UGL		
	S1194.		1374	80183	00177	DUDEN	LT	1.600	-01			
	51102	A	154	80183	30197	ENDRI	LT.	3.000	-12	UGL		
	\$11C.2	AC 266	1674	30183	80197	AENSLE	LI	2.500	02	UGL		
	51100	10065	1674	80183	00197	BENSLE	LÏ	5.400	-95	UGL		
	S110	11.000	1574	80193	80200	HGIDT	LT	5.000	-01	UGL		
	S1102	ACCAL	1.224	80183	80197	HFCL	L1	1.200	-01	UGL		
	51102	4.166	16 4	80183	80197	1.10		0.700	2	UGL		
	5110	6.000.4	10/4	20183	80225	(4 I		1.300	+ - 1	061		
	S110.	20. C 2. S	1e - 0	80183	80192	40.2	£ )		- )1	MGL		
										_	_	
	S1102	ALC: NO	1674	80183	80192	NUS		8.160	40	MGL	-5.2	29
	S110.	$\mathcal{N}_{\mathcal{A}}^{(1)} \cap \mathcal{A}_{\mathcal{A}}^{(2)}$	16-14	86193	80332	FE	ι:	1.700	+90	UGL.		
	511	ist through	1 (1 (1))	80193	80197	E F D D D	11	6.300	· • · 2	UGL		
	5110	1 · · · · ·	1 . 1	20183	30197	11110E	L I	1.100	>1	UGL		
	51102	An shut	16.15	0018 <i>1</i>	80197	PEDDI	L!	9.200	-02	UGL		
	STR.	i. And	10.0	20103	862.5	. F	; •	5.00 -	4.99	UGL		
	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1997 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	an teach	16.14	80183	80225	- {	:1	2.000	400	UGL		
						TL I	ιī	3.000	+00	06L		
	5110.	Constanting Constanting	16.11	80183	80225	I GHEN	1 I I	8.900	+00	UGE		
	31100		16.1	80183	S0197		<b>k</b> 1	8.900	+01			
	9110.	É G	1 6 7 - 1	80183	80225	2 C 1		0.000	+91	UGL		

PAGE: 1

.

•

STIE TYP : WELLS

.

ŧ

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER	<b>T</b> :001			ULTS	ACCV	FREC
IDENTIF: PATION	NUMPER	BCPTH	DATE	DATE	TEST NAME		MNTSA				
	*****										
51102	A0055	1674	80183	80197	240NT	LT	1.300	01	UGL		
51103	A0047	3586	80182	80192	N02	ĒŤ	2.500	- 01	MGL		
01103	A0057	3586	80182	80192	NU3		3.320	+00	MGL	-2.1	36
\$1103	A0067	3586	80182	80197	24DNT	LT	1.300	-01	UGL		
S1100 S1104	A0002	2283	80051	80084	AL		4.000	+02	UGL		
01104	10.00		00001								
51104	A66.22	2283	80051	80056	N02	LT	2,500	- 01	MGL		
51104	AC002	2283	80051	80056	N03		3.400	+00	MGL	-2.2	40
S1104	A0002	2283	80051	80084	FB	LT	1.700	+00	UGL		
51104	ACULE	2283	80051	60084	SN	ĒŤ	1.800	+01	UGL		
51104	A0002	2283	80051	80059	504	-	9.200	+01	MGL	27	3
51134	HUUUU	22.00	0.0001	0000	201		,				-
51104	60060	2543	80183	80225	AG	LT	3.000	+00	UGL		
S1104	8500A	2543	80183	80197	ALDEN	LT	3.300	-02	UGL		
S1104	A0068	2543	80183	80225	AS ·	LT	6.000	+00	UGL		
51104	A00.63	2543	80183	80197	FCB016	LT.	1.100	+00	UGL		
\$1104	A0058	2543	80183	80197	FCB221	LT	3.000	+00	UGL		
S1104	A0038	2543	80183	80197	FCB232	LT	2.400	+00	UGL		
S1104	A0048	2543	80183	80197	FCE242	LT	1.300	100	UGL		
S1104	A01-28	2543	80183	80197	PCB248	L.T	7.000	-01	UGL		
\$1104	60058	2543	80183	80197	PCBC54	LT	2.400	$\{\cdot, \cdot\}$	UGL		
51304	60088	2543	80183	30197	PCB250	LT	2.300	4 Cag	UGL		
51104	A0038	2543	80133	80225	I:E	LT	4.700	±01	UGL		
S1104	A0058	2543	80183	80197	AEHC	LT	1.700	- 01	UGL		
S1104	A0058	2543	80183	80197	BEHC	LT	3.500	-02	UGL		
S1104	80068	2543	80183	80197	DEHC		6.900	-02	UGL		
S1104	A0068	2543	80183	80177	CCL4	LT	3.000	-01	UGL		
			00407	00005	05		1 000	+00	UGL		
91104	ROORH	2543	80183	80225	CD CUCL 7	£ T	1.000				
\$1104	ACT 68	2543	80183	30197	CHCL3	LT	2.300	+00	UGL		
\$1104	A00< 8	2543	80183	80197	CLIAN	LT	1.100	- 01	UGL		
51104	A≏058	2543	80183	80225	CR	L.T	4.000	100	UGL		
S1104	80068	2542	80183	80225	ситат		1.000	894 1	UGL		
\$1104	60048	2543	80183	80197	DL DKN	Ę۳	1.600	-ÚÍ	UGL		
51104		2543	80183	80197	ENDRN	L.T.	3.000	-01 	UGL		
	A5688		-				2.500				•
51104	Acous	2543	80183	80197	AENSLE	LT			UGL		-
S1104	A 2004 G	2543	80133	80197	LENSLE	E1	5.400		UGL		
61104	60040	2543	80183	80200	HGTOT	LĪ	5.000	-01	UĞL		
51104	AC 201	2543	30183	30197	HECL	Lì	1.200		UGL		
51104	Afgerer 12	2543	80183	80197	LIN	L.1	0.800		UGL		
51104	н. А. 1958	2543	80133	80225	ti I	LT	8.000	1.0	UGL		
51104	HE TO	2543	80183	80197 80197	2650DD	L I L I	6.300		UGL		
		provide Privati K	80183 80183	01141	THE DE	L.1 L.1	1.100	1	UGL		
4			80183	5 M M	- 0.0E	21	1+100	1	096		
5,104	A. Sec	254.2	80187	80191	F F UEFT	LT	9.200	1.1	(the L		
51104	Acres G	2943	801	80225	1	Ĺ l	6.000	41.00	1951		
51104	A 9 - 8	254.4	80187	80225	14	ŧΤ	2.000	+00	UGL		
51104	A	2543	80183	80225	1.	11	3.000	ريونه ا	UGL		
81104	A	2544	80193	80197	TYPHEN	L T	8.900	+ 36	UGL		
27 a. n. 57 M	<b>H</b> 111 14 14	•. 7 <b>•</b> >	0.000	GAV 1.7.7	1.0001		0.700		000		

PAGE: 2

.

LITE TIPE: WELLS

.

1

SITE	SAPELE	SAMFLE	SAMPLING	ANALYSIS	PARAMETER			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	TEST NAME	ROOL	MNTSA	EXF	UNIT	ACRY	PREC
12012520000002	******		********	========	#321U2525	*****	322 <b>2</b> 233	****	======		= = = <del>=</del> = =
\$1104	82.20A	2543	80183	80225	ZN		7.800	+01	UGL		
S1104	A0058	2543	60183	80197	24BNT	ĻΤ	1.300	-01	UGL		
S1105	A0022	3265	80184	80192	NOZ	LT	2.500	-91	MGL		
S1105	A6662	3255	80184	80192	NO3		2.480	+00	MGL	-1.6	48
S1105	A0062	3265	20184	80197	24DNT	LT	1.300	-01	UGL		
01100		02.05				-					
51104	AC069	4052	80133	80192	N02	LT	2.500	-01	MGL		
\$1105	A0069	4052	80183	80192	N03		1.970	100	MGL	-1.3	60
\$1107	AC003	1453	80056	30086	AL	LT	3.000	+02	UGL		
S1107	A0003	1453	90056	80060	NO2	LT	2.500	-01	MGL		
	A0003	1453	80056	80080	NO3		6.000	-01	MGL	38	20
S1107	Hecho	1405	00000	00000	RUS		0.000	.01	HOL		20
S1107	A0003	1453	80056	80088	FB		7.700	+00	UGL	-0.3	10
	A0003	1453	80056	30085	SN	LĨ	1.500	+01	UGL	0.0	
51107						ц. I		+01	MGL		16
S1107	AUCU3	1453	80056	80059	504		1.600			5.0	10
S1107	60063	1936	80184	80225	AG .	LT	3.000	+00	UGL		
S110?	A0043	1936	80184	80197	ALDEN	LT	3.300		UGL		
\$1107	A0063	1936	80184	80225	AS	LT	6.000	+00	UGL		
S1107	A0083	1936	80184	80197	FCB016	LT	1.100	+00	UGL		
S1107	A0063	1936	80184	80197	PCB221	LT	3.000	+90	UGL		
S1107	A0053	1936	80184	80197	FCB232	LT	2.400	+00	ՍՅԼ		
S <b>11</b> 07	A0043	1936	80184	89197	FCB242	LT	1,300	+00	UGL		
S1107	A00-2	1936	80184	80197	F'CB248	LT	7.000	-01	UGL		
S1107	A0043	1936	80184	80197	FCB254	LT	2.400	+00	UGL		
\$1107	A9-2-6-3	1936	80184	80197	FCB260	LT	2.300	+00	UGL		
\$1107	A0063	1936	80184	80225	PE	ŁŤ	4.700	+01	UGL		
S1107	AU1763	1936	20184	80197	ABHC	LT.	1.700	-01	UGL		
		1,20				-					
\$1107	AUGUS	1936	80194	80197	BBHC	LT	3.500	-02	UGL		
\$1107	A0063	1936	50184	80197	LIBHC	LT	2.600	02	UGL		
					CCL4	L.T.	3.000	-v1	UGL		
S1107	A0063	1930	80184	80197							
\$1107	A0083	1936	80184	80225	CD CUICL 7	LT	1.000	100	UGL		
\$1107	A0065	1935	80184	80197	CHCL3	L.T	2.300	+90	UGL		
					C / L A \						
\$1107	ACCA3	1936	80184	80197	CLUAN	LT	1.100	-61	UGL		
S1107	AUCH3	1936	80184	£0325	CR	LT	4.000	+00	96L		•
S110.1	$f_{MM} = f_{MM} = f_{MM}$	1936	80184	80225	CUTOT		1.000	+91	UGE		
\$110	Almen 3	1936	80184	80190	DEDRN	L.T	1.600	61	UGL		
\$1107	A-2063	1936	S0184	80197	ENDRN	LT	3.000	- 02	UGL		
											•
S110 <sup>11</sup>	ACO13	1936	S0184	00197	AENSLE	LI	2,500	- 5 <b>2</b>	UGL		
\$1107	ALC: N	19.55	80184	80197	BERGLE	εT	A.400	02	UGL		
5 (3 0 <sup>11</sup>	AC 122 7	1976	80184	80200	HGIOT	Lì	5.000	+ 04	UGL		
\$1107	er	1935	80134	\$0197	HPTL	LI	1.200	- 01	UGL		
S1107	ne 53	1	30184	80197	LIN	LT	2.500		UGL		
		-			• • •	-					
511e. <sup>2</sup>	A	1938	80184	\$0225	NI	Lſ	8.000	+00	1/6L		
51107	A 3	1936	80184	80192	NU2	LT	2.500	- 01	MGL		
£1107	Activity	1930	80184	80172	N03	- ·	4.300	-01	MGL	-2.8	55
	Attend				NU 5 11[]	11	1.700	100	UGL	- <b>∠</b> +©	<b>9</b> 0
51107		1936	80184	80225		ι, Γ	6.300		UGL		
51107	Filtran 3	1936	80184	80197	FFDAD	L, I	0.300	1.	UUL		



.

•

SITE TYPE: WELLS

•

.

.

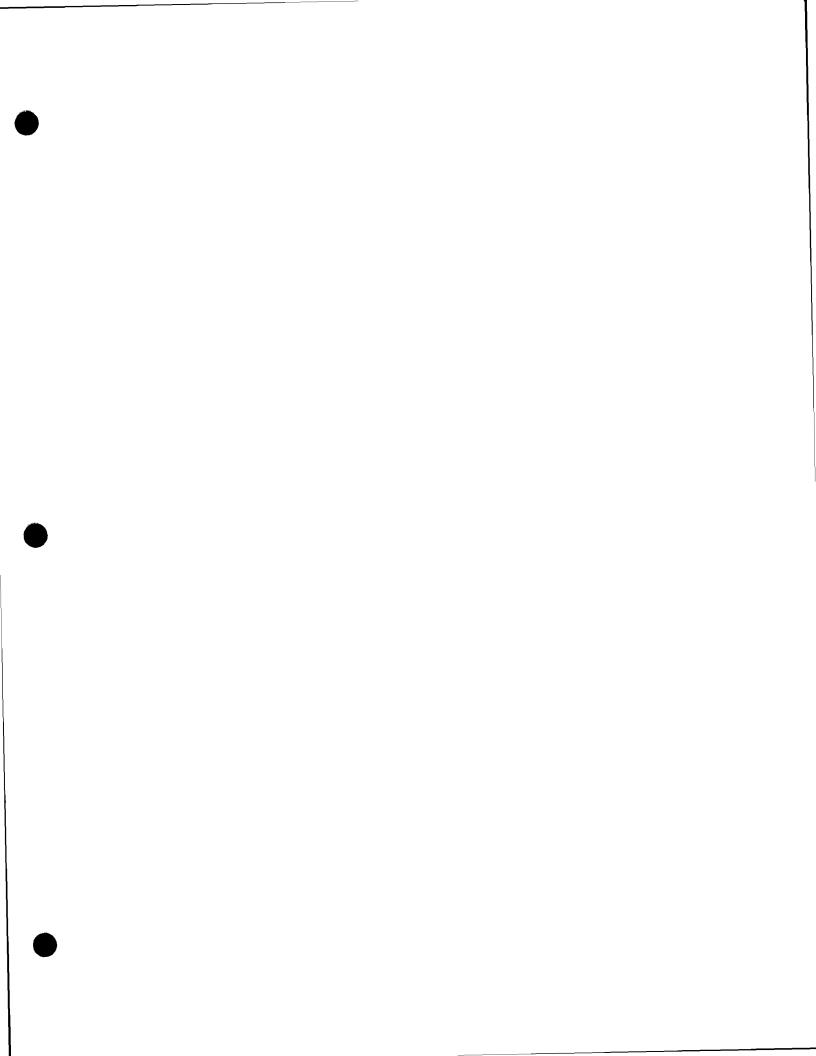
SITE	SAMELE NUMPLE	SAMFLE DEFTH	SAMPLING DATE	ANALYSIS DATE	PARAMETER TEST NAME	BOOL	MNTSA	E			PREC
SWADDODZZZZZCH		SALULL			terourgen						
31107	A0023	1936	80184	80197	FFDDE	LT	1.100	-01	UGL		
S1107	A0053	1936	80134	80197	PPDDT	LT	9.200	-02	UGL		
51107	A00.53	1930	60184	80225	SE	LT	0.000	+00	UGL		
S1107	A0003	1936	80184	80225	SE	LT	2.000	+00	UGL		
\$1107	A0063	1936	80184	80225	TL	LT	3.000	4 Qili	UGL		
\$1107	A00.3	1936	80184	80197	TREHEN	LT	8.900	+ 56	UGL		
S1107	ACOAS	1936	80184	80225	ZN		3.300	+91	UGL		
\$1107	A0063	1936	80184	80197	24DNT	LT	1.300	1	UGL		
S1108	A0004	575	80056	80084	AL.	LŤ	3.000	+92	UGL		
S1108	AQ004	525	80023	80070	ND2	LT	2,500	-01	MGL		
51108	A0004	575	80056	00003	NO3	LT	3.000	-01	mGL		
\$1108	A0004	575	80056	80083	F F	LT.	1.700	100	UÜL		
S1108	A0004	575	80056	80084	5N	٤T	1.300	<b>⊤</b> ⊡1	UGL		_
S1103	ACOCA	575	80056	80059	S04	·	1,530	+91,	MGL	46	2
S1108	AQ064	886	80184	80225	AG	LT	3.000	+20	UGL		
31108	A0044	806	80184	60225	AS	LT	6,000	+ 50	UGL		
S1108	A00:4	886	80184	80225	BE	LT	4.700	+01	UGL		
£1108	A00:4	886	80184	80197	CCL4	LŤ	3.000	1	UGL		
S1108	A007.4	839	80164	80225	CI	LT	1.000	+ 56	UGL		
\$1108	A0564	88*	80184	80197	CHULS	LT	2.300	• • • · ;;	UGL		
S1100	A0054	886	80184	80225	CR	LT	4.000	490	UGL		
S1103	A0074	884	80184	80225	CUTOT	-	7.000	+ 90	UGL		
S1103	A00.54	686	80184	80225	HGTOT	LT	5.000	-01	UGL		
51108	A0064	386	80184	80225	NI	LT	8.000	+05	UGL		
S1108	A00-4	886	80184	80192	N02		3.000	- 01	MGL	-0.2	34
\$1108	60044	325	80184	80192	N03		4.000	1	мGL	-2.6	С3
\$1108	ñ00c4	386	80184	80225	F E	LT	1.700	- i s Č	UGL		
S1108	A0064	806	80184	80225	SE	LT	6,000	$\hat{\mathbf{T}} = \{\mathbf{U}_i\}$	UGL		
\$1108	A0024	583	80184	80225	SE	LT	2.000	+0.0	UGL		
S1109	A0084	585	80184	80225	1L	LT	3.000	4.96	UGL		
\$1108	A0064	586	80184	80225	ZN		6.700	+01	UGL		
51108	AQ: 14	386	30134	80197	24 PNT	LT	1.300	-01	UGL		•
51101	ACOPT	2650	80057	80084	AL	LT	3.000	+02	UGL		
51104	AGENT	2650	80057	80060	N02	LT	2.500	- 1	MGL		
S1107	<b>60</b> 000	2650	80057	80060	N03		6.000	<b>+</b> •)0	MÓL	-4	C2
\$1107	A000 h	2650	80057	80084	F'F	ιī	1.700	<b>4</b> 30	UGL		
51107	ACC -	rated	80057	80084	1. pr	11	1.890	41.1	UGL		
51109	Access	. 65-	3005 1	80057	S04		2.800	÷.)*	MGL	8	9
S110°	Area in a	2941	80185	80177	CC1 4	£.1	3.009	- 6 j	UGL		
511.)9	<b>A</b> (), (17)	. 7-1	39185	80197	CHCL 3	LI	2,300	1.0	UGL		
S1109	AOCTO	287	80185	80197	241001	LT	1.300	- 1	UGL		
51111	40.000	2411	30028	80034	άL.	LI	3.000	+12	UGL		
S1111	A0(002	2411	80058	80040	P02	LT	2.500	-91	MGL		
S1111	<b>F</b> GROUP (* 1	2411	80058	80060	NUC	LT	2.500		MGL		
S1111	A9 13	2411	30028	80090	MÚ 3		2.000	-91	NGL	50	16

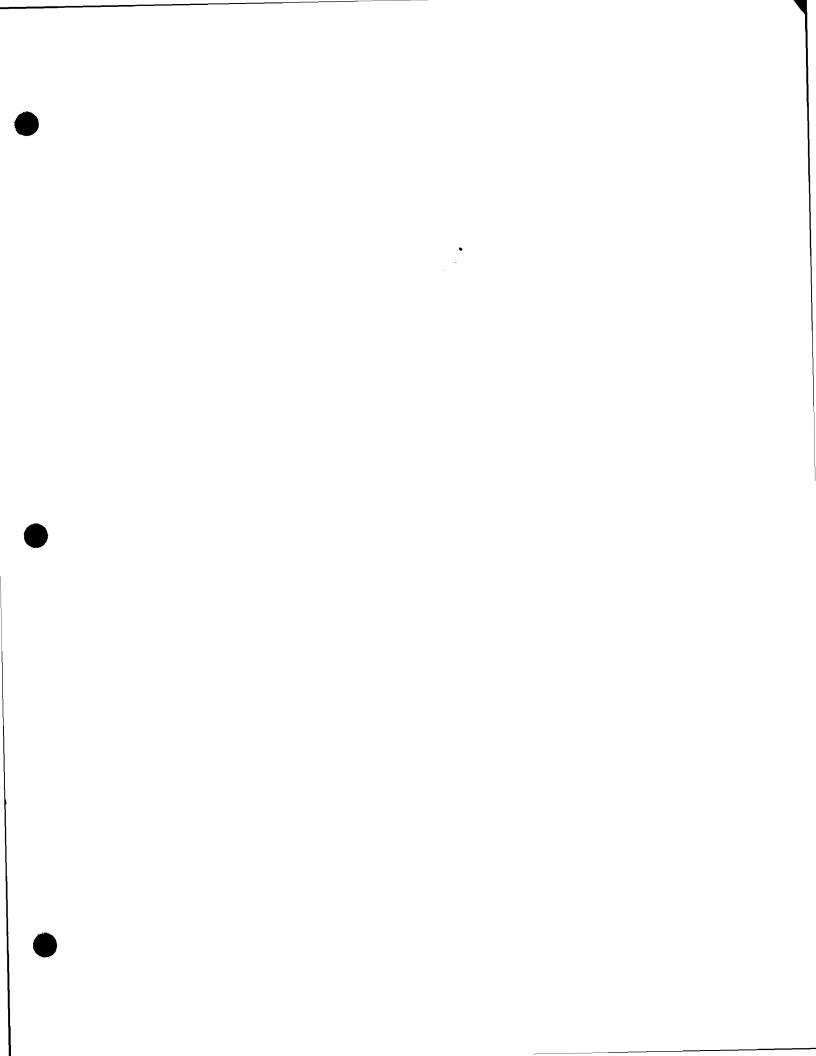
.

PAGE: 4

. . . .

.





,

CITE TIPE: WELLS

٠

.

ι

÷

2175 NOTTE E ATTOR	SAMPLE NUMPER	SAMPLE DEP14	SAMFLING DATE	ANALYSIS DATE	PARAMETER TEST NAME	BOOL	MNTSA	2 # F*		ACRY	-
***************	FLARFE	******	******		xa-azezzz	21.510	*******				*****
F 1 1 1 1	A0008	2411	80058	30060	N03		7.000	-01	MGL	50	16
51111			80058	80084	PB	LT	1.700	+00	UGL	130	
S1111	A0008	2411		80084	SN	LT	1.800	+ Ú1	UGL		
S1111	A0008	2411	80053			<b>C</b> 1	1,700	+61	NGL	+5	14
S111;	A00.08	2411	80058	80073	S04					TJ	14
S1111	A0065	2709	80184	80197	240NT	LT	1.300	-01	UGL		
91110	A0006	1981	80057	80084	AL	٤T	3.000	+02	UGL		
S1112	A0008	1981	80057	80060	N02	Lī	2.500	-01	MGL		
51112	A00.06	1981	80057	80060	NO3		1.000	+00	MGL	-0.7	12
S1112	A0006	1981	80057	80038	PB	LT	1.700	+00	UGL		
5111.	A0008	1931	80057	80086	<u>EN</u>	Ē.T	1.800	191	UGL		
\$1112	<b>A</b> 60056	1981	80057	80059	S04		3.300	+01	nGL.	10	7
				80192	504 NO2	LT	2.500	-01	MGL		<i>,</i>
S1113	AC055	1706	80189			Li			_		. 7
51113	A0-55	1708	80139	80192	N03		1.920	+ 90	MGL	-1.2	62
51113	A0055	1708	80189	80197	240NT	LT	1.300	-01	UGL		
31115	A0007	2747	80057	80084	AL	LT	3.000	+02	UGL		
81115	A0007	2747	80057	80050	N02	LT	2.500	01	MGL		
S1115	A0007	2747	80057	80060	NŬ3		1.900	+00	MGL	-1.2	60
\$111%	AC00"	2747	80057	80038	F B	LT	1.700	+90	UGL		
91115	A0002	2747	80057	80084	SN	LT	1.800	+01	UGL		
S111%	40007	274	80057	80059	\$04	_	1.800	+ 1	MGL	5	13
S1115	A0007	2747	30057	80057	S04		1.800	+91	MGL	5	13
51117	A0009	2799	80058	80084	AL	LT	3.000	+92	UGL		
S1117	60009	2799	80058	80050	N02	LT	2.500	-01	MGL		
51117	A0009	2709	80058	80030	N03		3.000	+00	MGL	-2	C4
S1117	AU-09	2799	80058	80084	F B		7.700	+00	UGL	-0.3	10
0111 <i>1</i>	60009	2749	80058	80084	SN	LT	1.800	+01	UGL		
\$1117	A0.09	2799	80058	80078	504		4.030	+91	MGL	+12	6
01117	A9050	33.11	80193	80197	CCL4		1.200	+01	UGL		Ū
			80193	80197	CHCL3		6.600	+91	UGL		
5111	AUCO	33.1						+92	MGL		
5:11 <sup>9</sup> -WDNR	A0050	3321	80193	80198	ALK		3.390	102	not		
S111 - WANK	A0050	33.21	80193	80192	COD		5.000	+90	MGL		
51112-WD000	AGC 50	3321	80193	80197	COND		5.500	+92	UnHC		•
51117-WDDP	AGUSO	3301	80193	80197	L.E		9.600	0 <b>1</b>	MGL		
21117-WE #C	A0050	3301	80193	80197	HCRE		4.350	+02	MGE		
S1117 UB98	A0050	3321	80173	80199	N03		2,180	÷00	MGL	-1.4	55
~1312-@1046	Ave. 50	3321	80193	80190	N25JEL	LT	1.000	100	MGL		
\$111 COMP		3321	80173	80193	FH	<b>-</b> ·	7.100	100			
e 11 Lugar	N99549	35.1	801 - 1	80224	SULFID	1.7	1.000	+00	MGL		
01010 W1000	6	3128	80053	80084	AL	. ,	5.000	102	UGL		
		31.0	80000 80005	80000	NO.	51	2,500	-01	MGL		
· ] · i	F1 11218	.7.4.	000000	0000	14.4	. '	21.270	- <b>-</b> - 4	1106		
51115	Ac. 10	31. 1	8000~	80040	N' (		1.500	+90	MUL	-0.9	80
S1110	61.10	27 <b>t</b>	80028	00004	F.F.		2.900	オワル	UGL	-0.1	27
S1112	A 10	31.1	80058	89084	50	E T	1.800	• • 1	UGL		
51119	ñ + ±0	51	80058	89670	5.04		3.900	+01	MüL	+12	6
11111	a a	12.00	80058	96024	éd.	LĪ	3.000	+0.1	UDL		
							·				

PAGE: 5

•

1

SITE TIPE: WELLS

•

•

.

ELLS		•							PA	GE: 6	
SITS IDEATHFICATION	SANPLE Junder	SAMPLE DEPTH	SAMPLING PATE	ANALYSIS DATE	PARAMETER TEST NAME		MNTSA	C Y F	_		PREC
				*******	********	*****	******		======	*****	****
\$1121	A0014	1205	80058	80050	N02	LT	2.500	-01	MGL		
S1121	A6013	1200	80058	80060	N03		2.700	-01	MGL	17	44
31121	A0114	1206	80058	30034	FB		3.800	+00	UGL	-0.2	20
S110J	a. 14	1205	80058	80084	SN	LT	1.800	+ 1	UGL		
\$1121	A0014	1206	80058	80078	504		2.000	+ 1	MGL	+6	12
	60156	1500	80189	80225	AG	LT	3.000	+00	UGL		
51121 51121	A0056	1500 1500	80189	80225	45		5.000	+ 0	UGL		
				80225		1 L.T	4.700	+01	UGL		
51121	A0056	1500	80139		BE .			-01			
31121	A0056 -	1500	80187	80197	CCL4	LT	3.000	-	UGL		
51101	A0052	1500	80189	80225	0.10	LT	1,000	+00	UGL		
51121	A0056	1500	80189	80197	CHCL3	LT	2.300	.+00	UGL		
61101	ADOSA.	1500	80189	80225	CR		5.000	+ 50	UGL		
51101	A0006	1500	30189	80225	ситот	L T	5.000	+00	UGL		
S11.01	60.56	1500	80139	80200	HSTOT .	L]	5.000	-01	UGL		
S112t	A0056	1500	80189	80225	115	LT	8.000	+00	UGL		
51121	A0055	1500	80189	80225	FB		5.800	+-20	UGL	-0.2	14
S1121	A00055	1500	80189	80225	SB	LT	6.000	+00	UGL	v	4.4
5.121	A00556	1500	80187	80225	SE	LT	2.000	+00	UGL		
						L 1	3.000		UGL		
51111	Ale Constants	1500	30189	80225	11	L.1		+ 90	UGL		
57 <b>1</b> 21	Acres A	1500	80139	80225	ZN	L. 1	1.500	• 1	0.95		
51121	60055	1500	80189	80197	240NT	LT	1.300	~61	UGL		
SJ121-WINR	A-055	1500	80189	80195	ALK		2,200	+02	MGL		
S1121-650R	A0055	1500	80189	80197	COD		4.700	+01	MGL		
51121-WD4R	A0056	1500	80189	80197	COND		3.380	+02	UNHC		
\$1121 VDVR	A0056	1500	80189	80197	FE		4.800	- V1	MGL		
\$11.1 \$PAR	AU056	15002	80180	80197	HARD		2.570	+02	MGL		
1111) WINE	H0000	1500	80189	80172	103		3.300	01	MGL	-2.1	72
S1101 CONR	A 55	1500	90189	80195	N2KJEL	LT	1.000	+00	MGL	2	12
						<b>L</b> _ 1			HOL		
S13 11 W200	A. 055	1500	80189	80193	PH CHURTE	. •	7+200	+			
G11 TO WINH	A11 54	1541	80182	80192	SULFID	LT	17000	+ ()()	MŰL		
41122	46011	3914	80050	80081	AL.	LT	3.000	+62	UGL		
S11	AG011	3914	80052	80086	NG	LT	1.100	+91	UGL		•
511.00	AP2 3 1	3914	80057	69069	K05	L.I.	2.500	1	MÜL		
1112	11	39:4	80001	30066	#03		2.500	1	ngl.	10	ί5
8112	60 QT 1	391)	30052	80088	ΗB		2,900	1 ( <b>V</b>	UGL	-0.1	27
514.1		141.4	8001.0	80084	1.14	LT	1.800	+ - 1	UGL		
1112		(**) A	20052	00059	004	<b>.</b>	4.000	<b></b>	mbl	12	0
11 21	an shall An shall	4		8017	24UNT	LT			UGL	1.2	0
		ан, 1 6	80180				1.36 .	1			
	60 (n. 5		800°.1	\$0004 2000-1	AL.	11	3.000	• 12 *	UGL		
543.23			846.1.1	80000	002	LT	2,500	- 12 L	MGL		
1112 v	A	1.1	<b>90</b> 057	89969	1153		7.000	190	MGL	-5	62
11	7 13		8005 -	30088	E E	L I	1.700	1.11	UGL		
5 H 1 21	$\lambda^{*} = 1.3$	1 A A	80053	89004	1274	LT	1.20	• 5 1	UGL		
11.	1.6 1.1 6	26142	00053	2005	-00 <b>4</b>		2.895	+ -, 1	MGL	່ຮ	<b>9</b> ·
	. · · · ·		80196	00.2.1	HD	• · ·	3.0.2	1-20	Ubi		

.

,

•

PAGE: 7

.

SITE TYPE: WELLS

.

.

.

.

۰.

.

0110	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER			÷F S	ULTS		
SITE					TEST NAME	ROOL	MNTSA			ACEY	FREC
IDENTJELCA (100	NUNHER	DEFILH	DATE	DATE	TEST RAAL						
	======	======			TASTETES	JE 11 - 1					
04407	A9052	3782	80190	80197	ALDEN	LT	3.300	-02	UGL		
S1123		3782	80190	80225	AS	LI	6.000	+00	UGL		
\$1123 811 <b>23</b>	A6652							100			
\$1123	A0052	3780	80190	80197	PCE016	LT	1.100		UGL		
\$1123	A0052	3782	80190	90197	PCB221	LT	3.000	+00	UGL		
91123	60052	3792	80190	80197	PCB232	LT	2.400	+00	UGL		
		7700	00100	00107	000040	. +	1.300	+00	UGL		
S1123	A0052	3782	80190	80197	FCB242	LT					
\$1123	A0652	3752	80190	80197	PC6248	LT	7.000	- )1	UGL		
\$1123	A0052	3782	80190	80197	FCB254	LT	2.400	÷ΰð	UGL		
\$1103	ADOSC	3782	80190	80197	FCB260	LT	2,300	+00	UGL		
\$1123	A0052	3782	80190	80225	BE	LT	4.700	101	UGL		
51123	A0052	3732	E0190	E0197	APHC	LT	1.700	-01	UGL		
\$1123	A0052	378.3	80190	80197	REHC	LT	3,500	)2	UGL		
S1123	A0052	3782	80190	80197	DEHC	LT	2.600	-02	UGL		
S1123	A0052	3782	80190	80197	CCL4	LT	3.000	-01	UGL		
S1123	60052	3782	80190	80225	CD	LT	1.000	+00	UGL		
\$1123	A00/32	3782	80190	80197	CHCL3	LT	2.300	+00	UGL		
\$1123	A0052	3732	80190	80197	CLUAN	LT	1.100	-91	UGL		
S1123	A0052	3782	80190	80225	CR		1.100	+01	UGL		
\$1127	40052	3782	80190	80225	CUTOT		1.000	+01	UGL		
111 3	A-052	3782	80190	80197	DE DRM	LI	1.000	- 61	UGL		
· · · · ·	•• • ••••	07.00	ere a se								
S1123	A0052	3782	80190	80197	ENDRN	LT	3.000	-02	UGL		
51123	A0052	3782	80190	80197	AENSLE	LT	2.500	- 02	UGL		
S1123	A0052	3782	80190	80197	BENSLF	LT	6.400	-02	UGL		
\$1123	A0002	3782	80190	80200	HGTOT	LT	5.000	- 01	UGL		
\$1123	A0052	3782	80170	80197	HFCL	LT.	1.200	-01	UGL		
		0, 01									
\$1123	A0052	3782	80190	80197	LIN	LT	2.800	· 02	UGL		
S1123	A0052	378.1	80190	80225	NI	LI	8.000	i 00	UGL		
511.3	A0052	3 292	80190	80225	F'B		1.400	1.11	UGL	-1	5
\$1103	A0052	378.	80190	80197	FEDDD	LŤ	6.300	- 1/2	UGL	-	-
S1123	A0002	3782	80190	80197	FFDDE	LT	1,100		UGL		
	H1002	2/04	00170	001//	TT DDC	<b>L</b> /		~.	000		
\$1122	A00/32	3782	80190	80197	FFDDT	LT	9.200	-02	UGL		
\$1123	A 2052	3782	80190	80225	SB	LT	6.000	+00	UGL		
\$11.3	61 1 1 1 L	3781	80190	80025	SE	LT	2.000	+ 9.5	UGL		
£112×	AUCAL	3782	80190	80225	л. Т.	LT	3.000	100	UGL		
91123	69052	3780	80170	80197	TXPHEN	LT.	8.700	FOU	UGL		
21 X K C	<b>B</b> 2 1 1 2	5701	0.71.77	001/	i si nen	<b>.</b>	01/00		000		
\$1123	AU012	3782	80190	80225	ZN		6.900	121	UGL		
S11.3	406.52	3782	80190	80197	2 ALMUT	LT	1.300		UGL		
51125 4108	611 · · ·	37:1	30190	30196	ALN	• •	2.320	+02	MGL		
STILE WITH	ADU: D	3702	80190	80190	669	LT	5.000	+00	mGL		
TALL ALON	A State	378.	80170 80110	80197	000		3.47	+.2	UNHC		
the second state of the	e		C 7 C	W V 1 /	5 5 F			• • •	Q. 11 IC		
41117 w1798	6965	3.7 -	80179	80157	۴ι		1.540	1.29	MGL		
ですべき ふくわたい	6	379.1	80196	10197	HARD		3.410	+	1051		
51177 W198	Sec. 2	37	00170	0(172	NO.3		3.910	4-00	MGL	-2.5	61
11.3 ul de		31	80190	80195	NUNJEL	LĪ	1.000	100	MGL		
011110 withe		3.75	30170	80176	FRE DEL	2.	7.000	+ 90			
- <b>1</b> (1)	FI '•	.* .	001/0	(77) 76	1.4		•	• • •			

	Variable	Description	Possible Entries
23.	Cont'd		<pre>LIV (liver) LUN (lung) MUS (muscle) OTH (other) ROO (roots) SEE (seeds) SFR (skin and fur) SFT (skin and feathers) SKI (skin) SOI (indicates a soil sample associated with the organism in the SPECIES column SPL (spleen) STE (stems) TEE (teeth) VIF (visceral fat) FIX (viscera [total]) VIX (viscera, except internal organs) WAA (whole body, except skin, fur, feathers and viscera) WAT (indicates a rinse-water sample associated with the organism in the SPECIES column) WAX (whole body, except skin, fur, feathers, viscera and brain) SCC (stomach and crop contents) SIC (stomach and intestines with contents) SKE (skeletal) STO (stomach) WBB (whole body, except skin, feathers, legs, feet, beak, viscera and brain) WHB (whole body, except viscera) WHO (whole body, except viscera) WHO (whole body, except stomach, intestines, femuts, humeri, kidneys and skin) WSF (whole body, except shell) WXK (whole body except skin, stomach, kidneys and feet)</pre>
24.	Sample Subprogram (Col. 66)	l character denoting the type of data for which the sample was collected.	<pre>S (special study) M (sample taken in the ecological monitoring program) C (sample taken in the compre- hensive survey) G (general observation) P (preliminary survey)</pre>
25.	Sample Number (Col. 67-72)	Terrestrial Biology Aquatic Biology	B0001 thru B0199 B0200 thru B9999
26.	Composite Sample NR (Col. 73-77)	5 alphanumeric field denoting one sample made up of aliquots of two or more individual samples.	EC001 thru EC999
27.	Stat Code (Col. 78-80)	3 digit code used in providing additional information per- taining to the organism	See λppendix B

### SAMPLING AND ANALYSIS ECOLOGICAL SURVEY - MONITORING PROGRAM (Continued)

## APPENDIX E

### INSTALLATION RESTORATION SAMPLING AND ANALYSIS GEOTECHNICAL-FIELD DRILLING

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS - GEOTECHNICAL-FIELD DRILLIND

GAND PUNCH

1	5	7
ING TA	T	FIL
8072	n	FD
	$\Sigma$	ĽIJ

. . .... .

1	8	12	22	29	34	39 4	<u>-</u>	44	50	55	60	62	58	71	77 80
	SITE	SITE IDENTIFICATION	ELEVATION	DATE	BORE HCLE •	ORO	INSP .	DEPTH - TOP OF INTERVAL	INTERVAL	ACTION/ HEA	итн	VALUE	DRI		SOH
	<u></u>	I ICCALL INTION		<u>+</u>	nere •	┼╌┥			THICKALU						
			<u><u></u><u></u></u>	┥╌┸╌┸╌┺	╺┝╼┥╌╹╌╹╌╹	┾╍╴┦	<u></u>	┟╺┶╌┵╌┻╼				<mark>╞╺┹╶┹╶┹╼┺╼┺</mark>		<b>↓</b>	┝┥
		<u> </u>		1	+	┟╍┨							ļu	<u></u>	┶┺┤
				Luur									Lu		し日
	1											-	1		1, 11
				┥╌┵╺┷╌┵╺┹╌									1		一日
		<mark>┦╴╴╴┧╶┥╴</mark> ┦┈┨╼┨ <mark>╸┫</mark> ┈┨╌ ╽	<u></u> ┥╴┸╌╹ <u>╴</u> ┸╶┸╺┹┈┶╌	<u> </u>	┨╌┷╌┛╌┹╼	┼┵┦		╎ ╵	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	┝╌┄┠╌╴┠╶╍╀╾╸┺╌	+	╞╍┹╌╃╶╃╌╃╌┽	╺╂╼┺╼┷╸	<del>╞╶╞╶╞╶╞╶</del> ┻╼┻╼	<u>┼┷╂</u> ╡
	<u> </u>	<u> </u>	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>		+	┼┵┤		<u>}_</u> +_+_t_+_			┥╍	<u></u>	+++	┟╺╌╺╴╸╸╸	
				<u> </u>	<u></u>	44	<u> </u>						$\frac{1}{1}$	<u> </u>	┟╻╡┦
													1		山日
							. 1						1	1	1.日1
	·	┫ <del>╶┺╶┹╼┹</del> ╌┸╼╉ <u>╴</u> ╂╌╉ <sub>╼</sub> ╂┈╁┈		┨┙┛┛┙		┨╌┨	- de altre altre a	<mark>┼┈┸╴┹┈</mark> ┖╶┛╼┹┈ ╎			╏┛				T EI
	·····		<mark>╆╌┶╌┶╌┷╌┷</mark>	<del>∱╺┹╺┻╺┺</del> ╼┺	╉╼╧╼	┼╍┦		<mark>}</mark> ╶┹╍┸╌┖┯┖╼┺╌	<mark>╡╺┷╶┶╼┺╺┷</mark> ╍	╶┹╶┸╌┺╌┺╴	++-		╉┹┷	<del>╡╺╹┍╹╹╹╹</del>	┼┷╁┨┥
	<u></u>		· · · · · · · · · · · · · · · · · · ·	+	+++++++++++++++++++++++++++++++++++++++	┝╍┥	<u> </u>				+-+-		4.1.1.	<u></u>	┼┵┠┤
				<u> </u>		┟╍┥							4		上目
												]			LE
											1				
			<u>                                     </u>		╅╼┺╼┺╼┻╼┻	+		╏		┟╌┺╌┖╌╃╼┺╺	╉┻		╶┽╌┸╌┸┄		
		<u>╶╶╃┈┥╶┥╶┥╶┥</u> ╶┥	}	┨┷┸┻		┝┷┤		<u>}</u>			╉╌	<mark>}_+_+_</mark>	╉╼┻╼┸╌		╋┷┠┛┥
			<u> </u>	<mark>┽╺╌╴╸</mark>	┥╍╺	┼┷┨	- <b>I</b> -F-	┟╼┷╼┺╼┻╼┻╼	$\frac{1}{1}$		╉╺	┟┶┶┶┷	╶╁╼┶╼	<del>]</del>	┼┵╂┥
			<u> </u>	fin	1	$\downarrow$									나타니
															一日
		<mark>┟╌┚╴┟╼╛╾┵┈┘╴┫╸┙╴╽╷╽</mark> ╶ ╽	<u> </u>		+	┼╌┤	-4-4-	┠┈┛╌┩┉┖╶┩╌╽╴		<b>────</b> ────────────────────────────────	+	┠ <del>┉┖┈┖┈┺╸┖</del>	┥┶┷	$\frac{1}{1}$	┼┷╁┨┥
				1	1	1.1.1		1 1 1 1 1 1		1.1.1.1.1	$\mathbf{t}$			LILL	

INS = INSTALLATION FA = FUNCTIONAL AREA T = DATA TYPE FIL = DATA FILE OFD = OROANIZATION INSP. = INSPECTOR Mir = METHOD SOM = STATUS OF HOLE CN = CARD NUMBER CRI = DRILLING MEA = MERSUREMENT

REVISED 12-77 CDIR Form 13-4.1, 1 Sep 78

•

### SAMPLING AND ANALYSIS - GEOTECHNICAL - FIELD DRILLING FILE

		4	
·	Variable	Description	Possible Entries
14	. Identification (Col. 1-7)	Plant/file	BASAGFD
5.	Site Type (Col 8-11)	4 letter abbreviation of type of landmark, feature, or con- struction being identified. This description/identification will have grid coordinates associable with it; however, grid coordinates will be entered in map file.	BASN (basin) BLDG (building) BORE (bore hole) CREK (creek) DTCH (ditch, drainage) LAKE PIT (pit/tree spade) PLUG (shovel sample) POND PPLT (pilot plant) RVER (river) SILO SPRG (spring) STRM (stream) STWA (standing water) SURF (surface-general) TWER (tower) WELL
6.	Sample Point (Col. 12-16)	Hydrogeology	S1000 thru S1999
7.	Elevation (Col. 22-28)	7 number recording of elevation of ground surface above mean sea level - in centimeters.	0000000 thru 9999999
8.	Date (Col. 29-33)	5 numb <b>er</b> Julian date that boring was started	79302 thru 79365 80001 thru 80090
9.	Bore Hole Number (Col. 34-38)	5 character identifier	H0001 thru H0999
10.	Organization (ORG) (Col. 39-40)	2 character abbreviation of organization doing boring	WZ AC
11.	Inspector (INSP) (Col. 41-43)	3 letter initials of the indivi- dual responsible for boring data	AAA thru 222
12.	Sample Depth - Top of Interval (Col. 44-45)	6 numbers - right justify to designate depth from topographic surface to top of sample inter- val - in centimeters (Record Depth to Bedrock under VALUE)	000000 thru 999999
13.	Thickness of Interval (Col. 50-54)	5 number thickness of interval for which this measurement or action was taken in centimeters	00000 thru 999999
14.	Action/Measurement (MEA) (Col. 55-59)	5 letter name of action or measurement taken on this interval	
		Meaning	Entry-Abbrev.
		<ul> <li>Advance auger down hole</li> <li>Color</li> <li>Compaction of strata during sampling (only when sample and sample interval are measured)</li> </ul>	ADVAU Color Compt
		d. Consistency e. Depih to Bedrock	CONSS DBRK
		f. Length of sampler pushed into the substratum	DRIVE
		9. Black fill of hole h. Ground water @ time of drilling	FILL GRDWT

	Variable	Description	Possible Entries
		Meaning	ntry-Abbrv.
14.	Cont'd	<pre>i. Ground water level (stabilized)</pre>	GRDWS
		j. Interval filled with neat cement	GROUT
		k. Hammer blower per foot of drive	HABLO
		1. Hydraulic pressure in psig	HYPRS
		m. Lithology n. Modification	LITHL MODIF
		<ul> <li>o. Interval retained for test and analysis</li> </ul>	SAMPL
		p. Length of screen or well point (top of screen and length of screen shown in variables 11 & 12)	SCREN
		g. Length of sand filter	SFILT
		r. Silt trap (below screen)	SITRP
		s. Length of PVC riser	STKUP
		t. Surface	SURF
		u. Time of drive, sec. v. Topographic setting	TIME Topo
		w. Unified soil class	USCS
15.	Method (MTH) (Col. 60-61)	2 character designation of method employed to establish value or	
16		entry.	
10.	Value (Col. 62-67)	6 number (5 digits plus decimal) value of hammer blows, hydraulic pressure, or other measurement to be determined i.e., Depth to Bedrock, reference from above: (h), (i), (e).	000.00 thru 999.99
17.	Drilling Units of Measurements (DRI UNITS) (Col. 68-70)	3 letter abbreviation of units of measure for the value.	PSI (pound pe <b>r square inch)</b> BL (blows) L (liter)
			CM (centimeters) LPM (liters-minutes)
			Consistency CONSS (d)
18.	Entry	Up to a 6 letter abbreviation	VSO (very soft)
	(Col. 71-76)	of consistency, color, unified soil class, topographic setting,	M (medium) ST (stiff)
		modifications, lithology or	VST (very stiff)
		surface	H (hard)
			VL (very loose)
			L (1005e)
			MD (medium dense)
		·	D (dense) VD (very den <b>se</b> )
			<u>Color</u> COLOR (b)
			Munsel Colors examples:
			5 YR 4/5 7.5 YR 4/5
			(decime) and slashes are
			implied)

## SAMPLING AND ANALYSIS - GEOTECHNICAL - FIELD DRILLING FILE (Continued)

.

ł

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - FIELD DRILLING FILE (Continued)

#### Variable

#### Description

#### Possible Entries

18. Cont'd

#### Unified Soil Class USCS (w)

- CH (fat clay, inorganic clay of high plasticity)
- CL (lean clay, sandy clay, silty clay, of low to medium plasticity)
- GC (clayey gravel, gravel-sand-clay mxitures) GM (silty gravel, gravel-sand-silt mixtures)
- GP (gravel, poorly graded, gravel-sand mixtures, little or no fines)
- GW (well graded gravel-sand mixture, little or no fines)
  ML (silt & very fine sand, silty or clayey fine sand or clayey
- silt with slight plasticity) MH (silt, fine sandy or silty
- soil with high plasticity) OH (organic clays of medium to
- high plasticity, organic silts)
- OL (organic silts and organic silty clays of low plasticity) PT (peat or another highly organic
- soil)
- SC (clayey sand, sand-clay mixtures)
- SI (shells) SM (silty-sand, sand-silt mixtures)
- SP (sand, poorly-graded, gravelly sands)
- SW (sand, well-graded, gravelly sands)
- WD (wood)

#### Topographic Setting TOPO (v)

	(local depression)
DUNE	(dunes
FLAT	(flat surface)
HLTP	(hilltop)
WTLD	(lake, swamp, or marsh)
PDMT	(pediment)
DTCH	(drainage ditch)
HLSD	(hillside [slope])
TER	(alluvial or marine terrace)
UNDL	(undulating)
VALY	(valley flat - valleys of all
	sizes)
DRAW	(upland draw)
	Modifications MODIF (n)

-	
в	(boulders)
cc	(concretions)
CS	(clay strata or lenses)
FILL	(disturbed soil)
IRNST	(ironstained)
LIG	(lignite fragments)
0	(organic matter)
ODOR	(odiferous)
OX	(oxidized)
PCDM	(poorly cemented)
ROUND	(rounded)
RT	(rootlets)
SDL	(sandstone lenses)
SDS	(sandstone fragments)
SH	(shale fragments)

SIS (silt strata or lenses)

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - FIELD DRILLING FILE (Continued)

#### Possible Entries Description Variable Modifications MODIF (n) (slickensides) SL SLF (shell fragments) SS . (sand strata of lenses) WD (wood) с (coarse) F (fine) FC (fine to coarse) FM (fine to medium) G (gravelly) LG (large) (medium) М ML (silty) s (sandy) SM (small) FECC (iron concretions) MNCC (manganese concretions) мот (mottled) MANMD (manmade or man-altered material) TR (trace) (trace of clay) (trace of gravel) (trace of sand) (trace of silt) TRCL TRG TRS TRML WCL (with clay) WML (with silt) WS (with sand) WG (with gravel) (dry) DRY LM (little moisture) MM (medium moisture) м (moist) VM. (very moist) WET (wet) Lithology Abbrev. Rock Term ALVM (alluvium) ANDR (anhydrite) ARKS (arkose) BSLT (basalt) BNTN (bentonite) BRCC (breccia CLCT (calcite) CHLK (chalk) CLAY (clay) CLSN (claystone) COAL (coal) CGLM (conglomerate) CQUN (coquina) DORT (diorite) DLMT (dolomite) DRFT (drift) EVPR (evaporite) GBBR (gabbro) GLCL (clacial - undifferentiated) GNSS (gneiss) **GRNT** (granite) GRVL (gravel) GRCK (graywacke) GPSM (gypsum) ASH (ash) DRLMSN (drushed limestone) RUBBLE (rubble or demolition fill) RESID (residium)

18. Cont'd

# SAMPLING AND ANALYSIS - GEOTECHNICAL - FIELD DRILLING FILE (Continued)

۰.

	Variable	Description	Possible Entries
18.	Cont'd		Lithology Abbrev. Rock Term IGNS (igneous - undifferentiated) LGNT (lignite) LMSN (limestone) LOSS (loess) MRBL (marble) MARL (marl) MRLS (marlstone) MMPC (metamorphis - undifferen- tiated) SHLE (shale) SILT (silt) SLSN (siltstone) SLTE (slate) SLTE (slate) STMT (syenite) TILL (till) TRVR (travertine) TUFF (tuff) VLCC (volcanic - undifferentiated) <u>Surface</u> WOODED (wooded) GRASS (grass)
19.	Status of Hole (SOH) (Col. 77-78)	2 letter abbreviation for status of hole.	BARE (bare) OL (open lysimeter installed) O (open) FC (filled concrete) FS (filled soil) OP (open piezometer) FD (filled bentonite)
20.	Comments (Col. 79)	l character left over (spare)	
21.	Card Number (CN) (Col. 80)	Blank in cc means parent card. A "1" means to look for trail- ing card(s). All cards be- longing to parent card have been found when another blank or 1 is encountered. Cards to be numbered in sequence 1, 2, 3	l thru 9

٠

## APPENDIX F

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS GEOTECHNICAL-PHYSICAL ANALYSIS

## INSTALLATION RESTORATION SAMPLING AND ANALYSIS - DEDTECHNICAL-PHYSICAL ANALYSIS

-----

. . . . . . .

-----



18	<u>}</u>	12	22	28	34 :	39	44	49	51	58 5	58	64	67	71	77	80
	BITE TYPE	BITE IDENTIFICATION	SANPLE NUMBER	DEPTH - TOP OF INTERVAL	INTERVAL THICKNEBS	BANPLE DATE	ANALY818 DATE	LAB	PHY8 TE8T NAME	нтн	PHYS MER	NEA EXPON	PHY8 UNIT8	VALUE	RNAL- TLYSI	
							4-1-1-2-3-0					$\frac{1}{1}$		ha	<b></b>	Ц
		· · · · · · · · · · · · · · · · · · ·	<u> </u>								- <b>h</b> _ <b>k</b>		┟╍┶┷	<u></u>	╁╍┷┙	Н
												┟╍╍			┽╍╍┥	Н
	<b></b>	· · · · · · · · · · · · · · · · · · ·			-4-1-4-4-				<u>} • • • • • •</u>	┞╺╶┨		┟┷┷		<u></u>	╉╍╍┙	Η
			<u>}</u>			-*-*-*-	┨┛┹┺┺┺		╏╴┹╌┺╌┺╼┹╌			┼┸╼┸╌	┨╌┸╌┹╌┹	<u>}_</u>	┿╍╍┙	Η
				<u></u>		<u></u>									╉╼┹╼┥	Н
							<u>}</u>	<u>}-</u> ▲			······································					П
			<u></u>													Π
															Lu	$\Box$
	<u> </u>							L				Lu		<u> </u>		Ц
	-		L					4				$  \dots$			$\downarrow$	Ц
								4				+			┽┷┷	μ
								┟╺╴	┟╼╺╺╺	┝╍┥		┟╍╍		<del> </del>	┽╍╍	Н
												┥╍╍			╉┺┷	Н
	للمسلح							┟╍	<u></u>				<u> </u>		┼┷┷	Η
	╼┺╼┻╼┺	<u> </u>	<b></b>		1.1.1.1			┟╼╼	<mark><mark>╞╶╃╶╃╶╄╼╄╼</mark></mark>			+ • •	┟┵┷╼		┽╍┵	Η
		<u></u>	<u></u>		_1_1_		<u></u>			┝┺┨		┟╌┺┈┺				Ħ
		········														П

INS = IRSTALLATION FA = FUNCTIONAL AREA T = DATA IYPE FIL = DATA FILE nTH = METHODCN = CARD NUMBEREXPON = EXPONENTPHYS = PHYSICALMEA = MEASUREMENT

**REVISED 12-77** CDIR Form 13-4.2, 1 Sep 78

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - PHYSICAL ANALYSIS FILE

•

	Variable	Description	Possible Entries				
1	<ol> <li>Identification (Col. 1-7)</li> </ol>	Plant/File	BASAGPA				
5.	Site Type (Col. 8-11)	4 letter abbreviation of type of landmark, feature, or con- struction being identified. This description/identificatio will have grid coordinates associable with it; however, grid coordinates will be entered in map file.	BASN (basin) BLDG (building) BORE (bore hole) n CREK (creek) DTCH (ditch, drainage) LAKE (lake) PIT (pit/tree spade) PLUG (shovel sample) POND (pond) RVER (river) SPRG (spring) STRM (stream) STWA (standing water) SURF (surface-general) TWER (tower) WELL (well)				
6.	Sample Point (Col. 12-16)	Hydrogeology	S1000 thru S1999				
7.	Sample Number (Col. 22-66)	Soils or Parent Material Sediment	D0001 thru D9999 M0001 thru M9999				
8.	Sample Depth - top o interval (Col. 28-33)	f 6 numbers - right justify to designate depth from topo- graphic surface to top of sample interval.	000000 thru9999999				
9.	Sample Interval - Thickness (Col. 34-38)	5 numbers - right justify to designate the thickness of interval for which this measurement was taken.	00000 thru 99999				
10.	Sampling Date (Col. 39-43)	5 number Julian date when sample was taken.	79300 thru 79365 80001 thru 80120				
11.	Analysis Date (Col. 44-48)	5 number Julian date when this measurement of the sample was taken.	79300 thru 79365 80001 thru 80120				
12.	Laboratory (LAB) (Col. 49-50)	2 letter abbreviation of organization doing analysis.	WZ (Warzyn) EE (EEI)				
13.	Physical Test Name (Col. 51-55)	Up to 5 character abbrevia- tion (numbers or letters) to identify the parameter being measured:					
		Parameter	Abbrev.				
Atte Atte		Atterberg Liquid Limit Atterberg Plastic Limit	ATTLL ATTPL				
		Colors	COLOR				
		Density, dry	DENSD				
		Density, wet	DENSW				
		*Grain sizes - see listing 0 end - Water content	MOISC				
		Permeability Specific, gravity	PERM SPCGR				

•

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - PHYSICAL ANALYSIS FILE (Continued)

Description Possible Entries Variable Parameter United Soil Classification System USCS 13. Cont'd. Porosity POROS Void Ratio VOIDR \* (Grain size, hydrometer, percent finer G050 than 0.05 mm) G010 (Grain size, hydrometer, percent finer than 0.01 mm) G0075 (Grain size, hydrometer, percent than 0.0075 mm) (Grain size, hydrometer, percent finer G005 than 0.005 mm) (Grain size, hydrometer, percent finer G002 than 0.002 mm) (Grain size, 3/8" sieve, percent finer) GS.37 (Grain size, 3/2" sieve, percent finer) (Grain size, 3/4" sieve, percent finer) (Grain size, 1-1/2" sieve, percent finer) GS.50 GS.75 GS1.5 (Grain size, No. 3 sieve, percent finer) GS003 (Grain size, No. 4 sieve, percent finer) GS004 (Grain size, No. 6 sieve, percent finer) GS006 (Grain size, No. 8 sieve, perdent finer) GS008 (Grain size, No. 10 sieve, percent finer) GS010 GS016 (Grain size, No. 16 sieve, percent finer) (Grain size, No. 18 sieve, percent finer) GS018 (Grain size, No. 30 sieve, percent finer) (Grain size, No. 35 sieve, percent finer) GS030 GS035 (Grain size, No. 40 sieve, percent finer) GS040 (Grain size, No. 50 sieve, percent finer) GS050 (Grain size, No. 60 sieve, percent finer) (Grain size, No. 80 sieve, percent finer) GS060 GS080 GS100 (Grain size, No. 100 sieve, percent finer) (Grain size, No. 140 sieve, percent finer) GS140 (Grain size, No. 200 sieve, percent finer) (Grain size, No. 325 sieve, percent finer) GS200 GS325 14. Method (MTH) 2 number designation of the method 01 thru 99 (Col. 56-57) used to generate this datum and is described in the methods file. 6 number (5 digit plus decimal) for normal scientific notation. 15. Physical Measurement 0.0001 thru 9.9999 (MEA) Mantissa (Col. 58-63) 3 number (+ or - sign plus -99 to +99 16. Measurement Exponent (MEA EXPON) 2 digits) exponent to base 10. Physical Units of 4 letter abbreviation of physical 17. CMSC (cm/sec) GMCC (grams/cc) units of measure. Measurement (Col. 67-70) PC (percent)

18. Value (Col. 71-76) 6 letter abbreviation of standard classification including:

Unified soils classes as shown

- CH (fat clay, inorganic clay of high plasticity) CL (lean clay, sandy clay,
- CL (lean clay, sandy clay, silty slay, of low to medium plasticity) GC (clay gravel, gravel,
- GC (clay gravel, gravel-scal sand-clay mixtures) GM (silty gravel, gravel-
- sand-silt mixtures)
  GP (gravel, poorly graded,
  gravel-sand mixtures,
  little or no fines)

#### SAMPLING AND ANALYSIS - GEOTECHNICAL - PHYSICAL ANALYSIS FILE (Continued)

### Variable

#### Description

Possible Entries

GW (well graded gravel-18. Cont'd. sand mixture, little or no fines) ML (silt and very fine sand, silty or clayey fine sand or clayey silt with slight plasticity) MH (silt, fine sandy or silty soil with high plasticity) OH (organic clays of medium to high plasticity, organic silts) OL (organic silts and organic silty clays of low plasticity) PT (peat or other highly organic soil) SC (clayey sand, sand-silt mixtures) SI (shells) SM (silty-sand, sand-silt mixtures) SP (sand, poorly-graded, gravelly sands) SW (sand, well-graded, gravelly sands) WD (wood) Hues that have values that are not Color integers will be truncated to an Munsel Colors integer... e.g.,  $\frac{\text{HUE}}{5\text{R}}$   $\frac{\text{VALUE}}{2.5}$   $\frac{\text{COLOR}}{6}$  = >5R26 NOTE: Only HUES 5R, 7.5R, 10R, 2.5R, 2,5YR, 5 YR, and 5Y will be affected. 19. Analyst 3 letter initials of individual re-AAA thru 222 as defined sponsible for measurement. One (1) number used to indicate 1 thru 9

(Col. 77-79)

20. Card Number

additional cards containing associated information and/or descriptions. Cards should be numbered serially since data will be connected in sequence.

## APPENDIX H TERRESTRIAL VEGETATION SAMPLING

#### INTRODUCTION

Badger Army Ammunition Plant was selected as a test site for determining the extent to which interpretation of infrared aerial photography of vegetation is a useful tool for tracking underground contamination. An aerial color IR report prepared for BAAP(1) identified areas of "stressed" vegetation and indicated suspected causes of stress, including moisture, wind, and suspected groundwater contamination. The approach taken in the "follow-up" program (the subject of this appendix) was direct sampling of vegetation for chemical analysis to determine the correlations, if any, between actual and suspected vegetation contamination as indicated by the IR report.

#### SAMPLING APPROACH

In order to provide a pool of specimens which could be analyzed to produce comparative chemical data, sampling was planned for the following types of areas:

- Areas of vegetation stress identified in the infrared (IR) report where the suspected cause was groundwater contamination.
- 2) Areas cited in the IR report as showing vegetation stress attributable to causes other than groundwater contamination (i.e., cited in the report as "moisture stress", "wind stress", etc.)
- 3) Areas cited in the IR report as supporting "healthy" vegetation or "no stress"
- 4) Areas where groundwater contamination was suspected but which were not cited as "stressed" in the IR report

Vegetation types prepared for sampling in these areas were as follows:

 Species or types specifically cited in the IR report (chiefly tress; trees were often "flagged" during the IR field check, making it possible to sample many of the individual plants cited as "stressed")

(1) Rome Research Corporation. Aerial Color Infrared Photography Interpretation, BAAP, Contract No. DAAK11-78-C-0137, Data Items A004 and A005.

- 2) Types with shallower root systems in same areas (thus providing for data on the vertical extent of any contamination)
- 3) The predominant vegetation in areas where no specific types were cited as "stressed" or "healthy", or where no IR citation exists

#### SAMPLING SITES

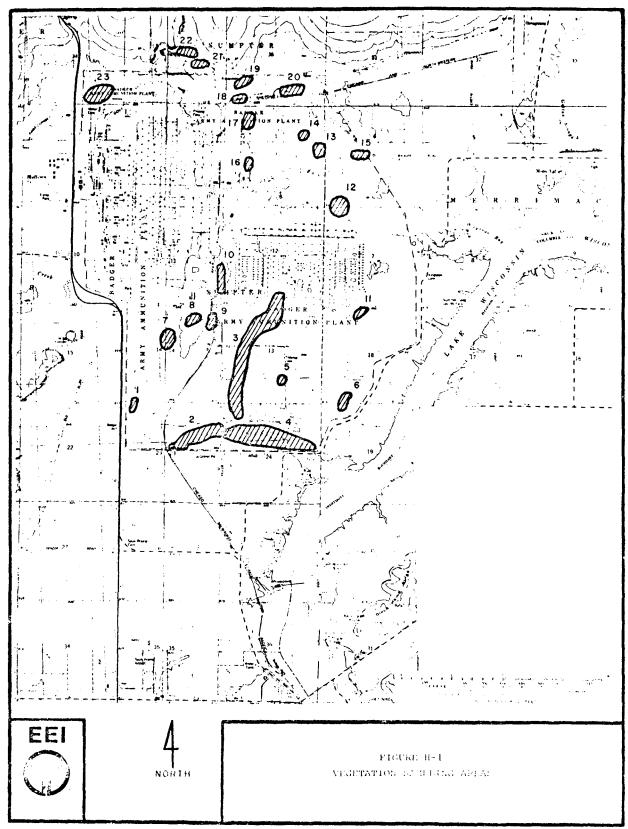
Based on an examination of the IR report, a preliminary site reconnaissance, and discussions with Army and Olin personnel, approximately 23 sampling areas were selected to represent the four site categories listed above. These areas are indicated on Figure H-1. Specific sampling sites within these areas, selected on the basis of vegetation distribution, are shown on Figure H-2. Table H-1 summarizes the overall sampling plan and indicates the relationship of the plan to citations in the IR report.

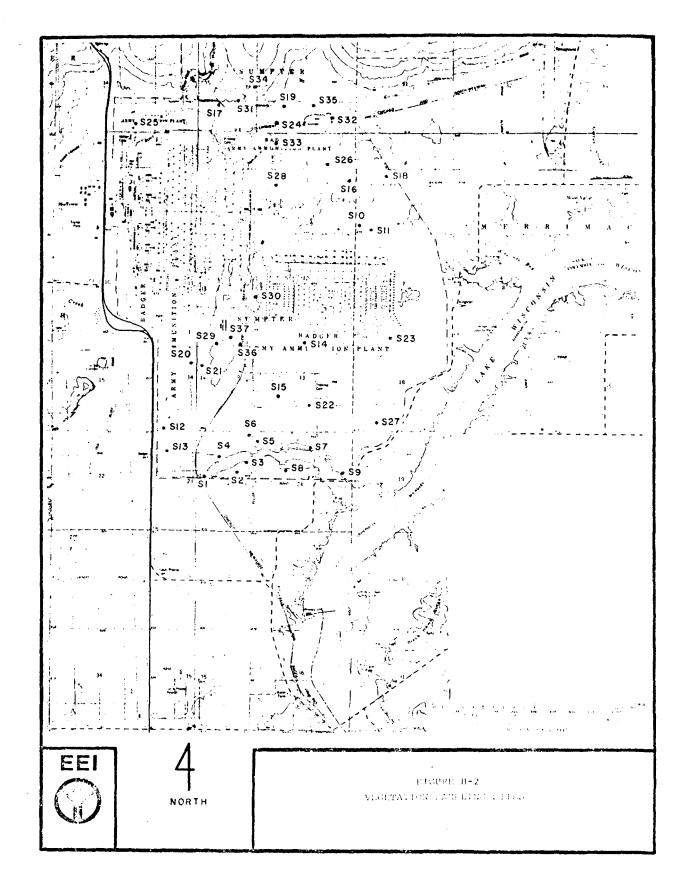
#### SAMPLES TAKEN

Approximately 100 specimens were required to produce an adequate sampling "pool" from these areas. The predominant tree species sampled were <u>Acer negundo</u>, <u>Populus deltoides</u>, <u>Quercus</u> <u>macrocarpo</u>, <u>Juniperus virginiana</u>, <u>Ulmus americana</u>, and <u>Prunis virginiana</u>. The predominant shallow-rooted species sampled were <u>Solidago canadensis</u>, <u>Erigeron annuus</u>, and grasses (chiefly <u>Muhlenbergia sp. and Poa sp</u>. Tissue types sampled included tree leaves and whole herbaceous plants except for roots. For each sample, a sufficient amount of tissue was collected to allow for any subsequent analyses. Specimens were placed in wide-mouthed amber glass bottles with Teflon cap liners, refrigerated immediately, and sent back to EEI's St. Louis laboratory.

#### STUDY CONCLUSION

The results of the screening analyses of groundwater samples indicated that little, if any, contamination of groundwater was present at BAAP. Therefore, no correlation could be drawn between groundwater contamination and contaminant levels in the vegetation samples, and vegetation analyses were deleted from the analytical program.





EITE TYPE, UELLS.

١

.

SITS	SAMILE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER				ULTS		
IDENTIFICATION	101MDER 2812288	DEPTH	DATE	DATE	TEST NAME		MNTSA				PREC
S1135-WENR	AUCC1	4633	80174	80197	000		6.000	+00	MGL		
SI135 WLAR	A0071	4633	80194	80177	COND		6.300	+02	UMHC		
£1135-Ub46	AUUU1	4633	80194	80197	F E		5.710	+ 00	nGL		
81175- JEDR	A0071	4633	80194	80197	HARD		6.980	+02	MGL		
S1135-LDMP	A0071	4633	80194	30199	803		8.900	-01	MGL	-5.7	C1
81135-WINR	A0071	4633	80194	80196	N2KJEL	LT	1.000	+00	MGL		
S1135- JDAR	A00''1	4633	80194	80198	FH		6.700	+ .40			
S1135-W1//R	A06-21	4633	80194	80224	SULFID	LT	1.000	+00	MGL		
S1136 WDRR	A0072	4572	80194	80198	ALK		3.360	+02	MGL		
S1136 WINR	A9072	4572	80194	80197	COD		۰،000	+00	MGL		
S1133 WEAR	60072	4572	80194	80197	COND		4.800	+02	UMHC		
51135+w.NP	A9072	4572	80194	80197	FE		2.350	+00	MGL		
S1136-WINR	A0072	4572	80194	80197	HARD		3.390	+02	MGL.		
51136+W100R	A9072	4572	80194	80199	50H		5,250	4 . <b></b>	ngr	-3.4	22
S1156 WERR	A0072	4572	80194	80196	NCKJEL		1.100	4 <b>0 0</b>	MGL		
S1130-WDMR	AU072	4572	80194	80198	FH		7.200	+ůů			
\$1138 WHAR	A0072	4572	80194	80224	SULFID	LT	1.000	+00	MGL		
51137	A0073	5456	80190	80197	ALDEN	Lī	3.300	-92	UGL		
51122	A6073	\$456	80170	80197	FLB016	L I	1.100	700	UGL		
01177	40173	5450	80190	息0197	FU 8221	LT	3.000	400	UUL		
S1137	A0673	5456	80190	80197	PCB232	LT	2.400	+00	UGL		
S1137	A0073	5455	80190	80197	PC2242	LT	1.300	+90	UGL		
S1137	AU-73	5456	80190	80197	FCB248	LT	7.000	-01	UGL		
S1137	A6023	5456	80199	S0197	FCB254	LT	2.400	+-)0	UGL		
S1137	A0023	5456	80190	80197	FCE260	LT	2.300	+00	UGL		
S1130	n0: 3	5450	80190	20197	ABHC	LĬ	1.700	- 01	UGL		
51132	ANU 13	5400	80190	80197	<b>BEHC</b>	LT	3.500	~ 02	U6L		
S11	ыр. 73	5454	20190	80197	DEHC	17	2.600	- 92	UGL		
当11号之	AL-073	5450	30190	8019	CLDAN	LT	1.100	· ••••••1	UGL		
81137	60023	5455	80190	80177	ENDEN	ι, T	3.000	-02	IJĠĿ		
61130	A90.3	54100	80190	80197	AENSLE	LF	2,500	-02	UGL		
51177	A-04173	5454	80190	80197	BENSLE	L.T	6.400	-02	UGL		
121137	ACTIN	54%	80190	80197	HE C.L.	L.T	1.200	- 01	UGL		•
S11 T	Filler S	5.4	80190	80197	L I ti	t. 1	2.800	~92	UGL		
\$1132	A0073	5456	80190	8016.	F'F'0'0'0	LT	6.300	~02	UGL		
511.11	40073	54	80190	30197	PPDDE	L.T	1.100	~01	UGL		
513	6.1573	545	80101	89197	ESDD I	÷ .	9.200	-92	UISE		
51137	60013	5 d 1	80190	30197	TXEHEN	LT	5.90		UGL		

.

PAGE: 10

. . .

ı

.

PAGE: 1

#### SITE TYPE: SETTLING PUMDS

-

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER			FES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	TEST NAME	BOOL	MNTSA	EYF	UNIT	ACRY	PREC
	10000000 1111111111	******	22232222		********						
S1201	D2018	0	80046	50084	NC		6.000	+04	UGG		
S1201	DS018	0	80046	80081	N02	LT	6.300	-01	UGG		
S1201	<b>D</b> 5018	Ŭ.	80046	80081	N03	LT	8.400	- 01	UGG		
51201	05018	0	80046	80092	S04		1.300	+93	UGG	+18	1
\$1201	D5017L	457	30046	80222	I/BF	LT	3.000	400	UGG		
\$1201	D5019L	457	80046	80222	DEP	LT	4.000	<b>+</b> 60	UGG		
\$1201	DS019L	457	80046	80218	24 PNT		1.090	+02	NGG	+.46	4
S1201	D5019U	452	80046	80222	DEF	LT	3,000	+00	UGG		
51201	DS019U	457	80046	80222	DEP	LT	4.000	+00	UGG		
S1201	D5019U	452	80045	80218	24DNT		8.700	+91	NGG	+3.7	5
S1202	050205	91	90050	80263	DBP	LT	3.000	.+00	UGG		
\$1202	050205	91	80050	80263	DEF		1.340	+03	UGG		
\$1202	D50205	91	80050	80249	24DNT		6.810	+02	NGG	+2.9	К9
S1202	15020U	91	80050	80222	DEF .	LT	3.000	+ 20	UGG		
S1202 S1202	15020U	91 91	80050	80222	DEP .	LT	4.000	+00	000		
5129.	100200	91 <sub>.</sub>	80000	00222	I'C F	£ 1	4.000	1.20	000		
C1 00 0	<b>05020U</b>	91	80050	80218	24DNT	LT	9.000	+00	NGG		
S1202			80050	80222	DEP	LT	3.000	+00	UGG		
S1202	P5021	457		80222	DEF	L1	4.000	+00	000 UGG		
S1202	05621	457	80050		24D0T	ι. 1	9.000	400	NGG		
\$1202	15021	457	80050	80218		ι. Ι	9.750	403	UG6		
91292	m0001	0	80050	80038	ňL.		· · / DV	- 0.5	000		
S1202	M0001	0	86050	80033	F B		1.000	+02	UGG		
		-			SN		4.500	-01	000		
S1202	M0001	0	80050	80008			3.440	+02	UGG UGG	+4	.3
\$1202	h0001	Û	80050	80092	504					+4	• •
\$1203	D2022	91	80051	80222	DBF	LŤ	3.000	+00	UGG		
S1293	₽5022	91	80051	80222	DEP		1.060	+02	UGG		
0 4 C 3 T			0 ( A F 4	01010	DATUIT		1.710	+04	NGG	+.72	C2
\$1293	<b>BSC22</b>	<u>81</u>	80051	80218	24ENT DEF	LT	3.000	104	UGG	+./2	62
31203	05023	468	80051	80222		L. I					
S1203	05023	488	80051	80232	DEP DEP		1.100	+01	UGG		
\$1203	DS623	488	80051	80218	2410/T		2.700	+02	NGG	+1.1	31
51203	N0002	0	80051	80088	AL		1.030	1-2-1	066		
					*. *. * .	LТ	3.000	+00	UGG		
51203	mouor	0	80051	80222	DEF	<b>L</b> 1	4,600	+00	000		
\$1203	n0<92	Ú,	50H51	80222	DEF:						•
S <b>1</b> 205	m⊅00	e	80051	80088	L L.		4.500	+01	063		
S1203	Mereo⊉	0	80051	80008	SH		5.800	+>	UGG		
S126J	MON QUE		30051	80092	804		o.č10	+02	UGG	+8	• 1
	a		6 h h f f f		0.47.017		1.720	+05	NGG	+.73	2
S120 T	1002	0	80051	80013	24ENT		3.000			T./3	2
11004	1174 - 4C	1	80050	80222	D:1:F	ΙT		+ 00	000		
81204	R54.240	152	80050	80222	DEF		5.000	 	UGG		<b>F</b> ~
51204	<b>B</b> 50240	11/2	80050	80218	24DNT		2,190	+02	NGG	3.00	59
51204	<b>U</b> SO	19 MW	80000	80000	DBE	LĨ	3.00	190	UGG		
		s				1. 1	4.000	1000	1515		
04.20A	Phone in		80054 80054	10.22	h-CF DADAT	<b>i</b>	2.400		060 NGG	+1.0	C4
S1.01	15 20	2.74	800%0	80218	24DNT		1.450	+91 +94		4110	64
S1_304	M-HU3	<u>ل</u> ان	80050	SC088	AL.			+02	UGG		
\$1299	MU1003	0	80050	80084	F41]		3.360		U66 U66		
91264	NC (40-3	Ċ,	80050	00081	802	L.T	6.300	- <b>G</b> i	1166		

.

#### VITE TYPE: SETTLING PONDS

¢.

.

.

SITE	SAHPLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER				ULTS		e.e.=.=
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	TEST NAME		MNTSA			ACRY	PREC
	·····	******									
S1204	M0003	0	80050	80081	N03	LT	8.690	-01	UGG		
\$1204	M0003	õ	80050	80086	FB		1.800	+02	UGG		
51204	M0003	õ	80050	80085	SN		1.200	100	UGG		
51204	M0003	ō	80050	80092	S04		5.820	+01	UGG	+.7	2
\$1205	D5027	Ŭ	80050	80085	ÂL.		3.750	+03	UGG		
		-									
S1205	05027	0	80030	80222	DEP	LT	3.000	+00	UGG		
\$1205	15027	ō	80050	80222	DEP	LT.	4.000	+00	<b>UGG</b>		
S1205	D5027	ò	80050	80081	N02	LT	6.300	-01	UGG		
S1205	D5027	ŏ	80050	80031	EON	LT	8,400	-01	UGG		
S1205	D5027	ŏ	80050	80086	FB		3.000	+01	UGG		
01200	10000.0	v	00000	00000	• •		0.000				
S1205	D5027	0	80050	80085	SH		4.700	+00	UGG		
S1205	05027	ŏ	80050	80072	S04		2.020	+01	ÜGG	+.20	5
S1205	D5027	ŏ	80050	80219	210NT -		4.000	+01	NGG	+1.7	11
S1205	D5028	457	80050	80222	DEF	LT	3.000	+00	UGG	• = • •	
\$1205	D5028	457	80050	80222	DEP	LT	4.000	+00	UGG		
01200	10002.0	-27	00000	00226	1.61	<b>L</b> 1	41000		000		
G1205	D5028	457	80050	80218	24DNT	LT	9.000	+00	NGG		
S1205	n0018 n0050	18	80193	80222	DBP	LT	3.000	+00	UGG		
		18			DBF	LT	3.000	+00	UGG		
S1205	MOOSO		80193	80222	-	L 1		402	UGG		
81205	M0050	13	80193	80222	DEP		1.350				
S1205	ncoso	18	80193	80222	DC F		6.800	+01	UGG		
					- · · · · · -						<b>.</b> .,
\$1205	30050	18	80173	80218	24ENT		7.570	+03	NGG	3210	56
S1204	15029	0	80053	80086	AL.		1.750	+03	UGG		
\$1206	15029	Ċ.	80053	80222	DBP	ĻŤ	3.000	+00	UGG		
S1205	15029	0	80053	80222	DEP	LT	4.000	100	UGG		
81206	DS0.12	0	80053	80084	NC		1.700	-01	UGG		
S1206	1096-29	Ŷ	80053	80081	NŪ2	LT	6.300	01	UGG		
51206	D5039	0	80053	80081	50M	LT	8.400	- 91	UGG		
S1206	DS004	0	80053	80085	F'B		2.000	+01	UGG		
81266	DS029	0	80053	80086	SN		3.900	+00	UGG		_
51206	DS029	Çi	80053	80092	804		1.520	+01	000	+.20	7
											. –
S1205	D5020	0	80053	80218	24DNT		5.700	401	NGG	+2.4	07
S1206	<b>B</b> S030	457	80053	80222	DEF	LT	3.000	+9.0	UGG		•
91208	115630	450	80057	80222	DC F	LT	4.000	+06	066		•
S1296	D5030	457	30053	80218	24DNT	LT	9.000	+00	N66		
SJ 206	K0051	18	80193	80222	Į(EF)	١ľ	3.000	+00	U66		
											•
S1106	<b>m</b> 0051	18	60193	80202	DEP		4.400	+61	066		
11204 ·	<b>m</b> ieria.	18	50123	80218	240NT		2.610	103	NRG	1110	16
0 <b>11</b> 67	105011	6-1	80053	30222	D(3)	LT	3.000	100	069		
S1207	Different 1	2. i	80053	80222	DEF	LT	4.000	+1)17	UGG		
S120 1	$D^{*} \in [-\pi]$	2.3	8005	80218	2.4 FONT	Lſ	9.000	+0	NGG		
• 1	et est		80053	80222	DEF	L.T	3.000	<u>ú</u>	UGG		
1.00	$\Omega^{2} \subset \mathbb{R}^{2}$	4.5	80053	80222	UEE	LT	4.000	+ 90	404364		
G1267	pf 6.5.7	4	80053	80218	241001	LT	9.000	+00	NGL		
51201	6,000.01	· ,	80053	SOCHA	AL.		1,900	104	فادانا		
51202	M-1 1	( <b>•</b>	80053	50081	110		1.033	403	1/66		

#### PAGE: 2

#### SITE TYPE: SETTLING PONDS

.

1

1

#### PAGE: 3

SILE	SADFLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER			SES	ULTS		
IDENTIFICATION	NUMPER	DEPTH	DATE	DATE	TEST NAME	BOOL	ONTSA	₹ z1:	UNIT	ACRY	FREC
marmamero comma	<b>.</b>	****		*****	********	=====					****
										•	
\$1207	MOCCA	0	20053	80081	N02		3.405	+00	UGG	+3.1	K1
\$1207	M0004	0	80053	80081	80M	LT	8.890	-01	UGG		
S1207	M0004	o	80053	80036	F'E		1,650	+02	UG <b>G</b>		
S1207	M0-04	0	80053	80086	SN		1.100	+00	UGG		
\$1267	h0004	0	80053	80092	504		1.830	+02	UGG	+2.0	.5

.

#### SITE TYPE: LANE WISCONSIN-WATER

.

SITE	SAMFLE	SAMPLE	SAMPLING	ANALYSIS	PARAMETER				ULTS		
NOTTATIFICATION	NUMBER	DEPTH	DATE	DATE	TEST NAME	BOOL	MNTSA	EXP	UNIT	ACRY	PREC
<b>DERENAUNCER</b>	*****	======	*******	********		*====		<b>x</b> = ~ 2 = 2	*****		
S1301	W0016	60	80058	S0084	AL		3.000	+02	UGL		-
\$1301	W0016	50	80058	80091	NC		1.290	+01	MGL	+0	3
S1301	W0016	60	80058	80066	N02	LT	2.500	-01	MGL	27	21
S1301 .	W0016	60	80058	80066	N03	LT	3.600	-01	MGL		
S1301	W0015	60	80058	80084	FB		4.800	+00	UGL	-0.2	16
S1301	WOOle	60	80058	80084	SN	LT	1.800	+01	UGL		
S1307	W0017	60	80058	80084	AL	LT	3.000	+02	UGL		
S1307	W0017	50	80058	80091	NC	-	2.010	400	MGL	+.01	18
S1307	WOC: 7	50	80058	80065	NO2	LT	2.500	-01	MGL		
S1307	W00;7	50	80058	80056	N03	<b>.</b>	4.400	-01	MGL	28	27
51.507	W001	00	00030	00000	16.5.5			••	noe		•
S1307	₩0012	60	80058	80084	PB	LT	1.700	400	UGL		
S1307	W0017	60	80053	80084	SN	LT	1.800	401	UGL		
\$1307	W0017	60	30058	80078	S04		2.100	+01	MGL	+6	11
S1312	W0018	50	80058	80084	AL	. LT	3.000	+02	UGL		
\$1312	W0013	50	80058	80091	NC	-	2.260	+00	MGL	+.01	16
orer.		00	00000	00071			21200				
\$1312	W0018	60	80058	80066	204	LT	2.500	-01	MGL		
S1312	W0010	60	80058	80036	N03		4.400		MGL	28	27
\$1312	W0013	60	80058	80084	F'B	LT	1.700	+00	UGG		
51312	W001.1	69	80058	80084	SH	LT	1.800	+-91	UGL		
\$1712	W0018	60	80058	80092	504	•	2,300	+ 31	MGL	+7	10
		c.	0.7700		524 C 1		2.000			•	
S1314	W0019	60	79319	80091	NC		6.470	+90	MGL	+.03	6
51314	W0019	60	79319	80084	SN	LT	1.800	+01	UGL		
						-					

PAGE: 1

----

.

#### THE TYPE: LAKE WISCONDIN-SEDIMENT

.

.

FAGE	:	1
------	---	---

• •

Sito:         Diox         There         There         There         There         There           Sito:         Diox         Diox         Diox         Diox         Diox         Diox         Diox           Sito:         Diox         Diox         Diox         Diox         Diox         Diox         Diox           Sito:         Diox         Diox         Diox         Diox         Diox         Diox         Diox           Sito:         Diox         Diox         Diox         Diox         Diox         Diox         Diox         Diox           Sito:         Diox         Dio	STIE IDENTIFUCATION	SAMPLE NUMBER	SAMFLE DEPTH	SAMFLING DATE	ANALYSIS DATE	PARAMETER TEST NAME			E + P	ULTS UNIT		PREC
1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	BERSNER_ JELBAR	******	*****	£=====	nssescu	F=c=====	*****	******			322323	****
1       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122       122												
13331       10535       122       80049       80252       MM3A2       4.756       +02       U06         51301       10535       122       80049       80249       PH       7.200       +02       U06         51301       105362       0       80049       80049       80081       M02       LT       4.756       +02       U06         51301       105362       0       80049       80081       M02       LT       8.430       -01       U66         51301       105742       0       80049       80081       M03       LT       8.430       -01       U66         51301       105742       0       80047       80082       SN       1.500       +00       U66       1.400       +1       2         51301       105742       0       80047       80022       CD1       1.400       +5       U66       1.400       +5       U66       1.400       +5       U66       1.400       +4       1.50       +00       +6       1.420       +4       4.400       +6       1.400       +6       1.420       +4       4.400       +6       1.50       +6       1.50       +6       1.50       +6 <td></td>												
13331       D5035       122       B0049       B0049       B0046       PH       7.200       *00         51301       D5036       0       B0049       B0091       MC       1       3.800       +03       UGS         51301       D5036       0       B0049       B0091       MC       1       4.300       -01       UGS         51301       D5036       0       B0049       B0091       MO2       1       4.300       -01       UGS         51301       D5036       0       B0049       B0084       FB       9.500       +01       UGS         51301       D5036       0       B0049       B0082       FB       -500       +01       UGS       +1       2         51301       D5036       0       B0049       B0059       FM342       -500       +01       UGS       +1       2         51301       D5038       122       B0049       B0259       FM342       -4.00       +04       UGS       +1.420       +04       UGS       +1.420       +04       UGS       +1.420       +04       +05       +1.40       +1.40       +1.40       +1.40       +1.40       +1.40       +1.40 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>												
Si201         Diditic         Diditic         Diditic         Diditic         Picon										UGG		
1:01:1         1:00:10         0:00:00         1:00         1:00         1:00         1:00         1:00           51301         D0:36C         0         B0:049         B0:081         M02         LT         8:300         +03         M06           51301         D0:36C         0         B0:049         B0:081         M02         LT         8:400         -01         UG6           51301         D5:36C         0         B0:049         B0:084         FB         9:500         +01         UG6           51301         D5:36C         0         B0:049         80:082         C00         -1:040         +05         UG6           51301         M0:05C         0         B0:049         80:200         C00         -3:00         +1         UG6         +1         2           51301         M0:05C         0         B0:049         80:220         CEC         4:00         +01         UG6           51302         D5:38         122         B0:049         80:220         E1:13         -4:00         +01         UG6           51302         D5:38         122         B0:049         80:221         +1:13         +00         UG6         +1:0         K2 <td></td> <td>1/2035</td> <td></td>		1/2035										
5:301       0:0:4:C       0       80049       80091       MC       3.800       403       0.66         5:301       0:5:34C       0       80049       80081       M02       LT       8.400       -01       0.66         5:301       0:5:34C       0       80049       80086       FB       9.500       +01       0.66         5:301       0:5:34C       0       80049       80086       FB       9.500       +01       0.66         5:301       0:5:34C       0       80049       80082       504       -3.300       +01       0.66       1       2         5:301       0:7:7:5:0       0       80049       80220       CDD       -4.300       +00       0.06       1       2         5:301       0:7:7:7:5:0       0       80049       80220       CDD       -4.400       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +00       +1       +00 </td <td>S1301</td> <td>DS036<b>C</b></td> <td>0</td> <td></td> <td>80086</td> <td>AL</td> <td></td> <td>9,500</td> <td>+03</td> <td>UGG</td> <td></td> <td></td>	S1301	DS036 <b>C</b>	0		80086	AL		9,500	+03	UGG		
Si301         NO3 LC         0         E0049         B0081         NO2         LT         6.300         -31         UGG           Si301         NC03CC         0         B0049         B0081         NO3         LT         6.300         -31         UGG           Si301         NC03CC         0         B0049         B0086         FR         9.500         +01         UGG           Si301         NC03CC         0         B0049         B0020         S044         B0020         +00         UGG         +1         CO         UGG         +1         UGG         +1         CO         UGG         +1         CO         UGG         +1         UGG								7 000	107			
Si301         DC024C         0         B)049         B0081         MG3         LT         B,400         -01         UG6           Si301         DC036C         0         B0049         B0086         FR         9.500         +01         UG6           Si301         DC036C         0         B0049         B0086         FR         9.500         +00         US6           Si301         DC036C         0         B0049         B0086         SN         1.500         +00         US6           Si301         DC036C         0         B0049         B0029         FR         7.000         +00           Si301         DC038         122         B0049         B0220         CEC         4.900         +00         HEG6           Si302         D5038         122         B0049         B0221         HA32         6.400         +01         UG6           Si302         D5038         122         B0049         B0221         HA32         6.400         +01         UG6           Si302         D5038         122         B0049         B0081         M02         1.135         +00         UG6         1.005           Si302         D5039C <t< td=""><td></td><td>-</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		-	-									
Si301         D5032C         0         D5049         B0085         FB         9.500         401         UG6           Si301         D5036C         0         80049         80086         SN         1.500         401         UG6           Si301         D5036C         0         80049         80086         SN         1.500         401         UG6         1         2           Si301         D4090C         0         80049         80020         CDD         1.040         405         UG6         1         2           Si301         D4090C         0         80049         80220         CEC         4.000         400         UG6         1         2           Si302         D5038         122         80049         80220         CEC         4.000         401         UG6           Si302         D5038         122         80049         80254         HBM2         4.400         401         UG6         41.0         N2           Si302         D5036         0         8049         80254         FB         4.000         401         UG6         41.0         N2           Si302         D5036         0         8049         80081					- · ·							
Si301         PEORAC         0         SO049         SO084         SN         1.500         +00         UGG           Si301         DF03.0         0         S0049         S0082         SO0         +00         UGG         +1         2           Si301         DF03.0         0         S0049         S02.0         CDD         1.040         +05         UGG         +1         2           Si301         DF03.0         S0049         S02.9         CDD         1.040         +05         UGG         +1         2           Si301         UUR         D5032         122         S0049         S0220         CEC         4.00         +01         UGG           Si302         D5038         122         S0049         S0220         CEC         +30         UG6         +1.0         K2           Si302         D5038         122         S0049         S0249         FH         5.000         +00         UG6         +1.0         K2           Si302         D5038         122         S0049         S0081         M03         L1         8.400         -01         UG6         +1         1         K2           Si302         D5037C         0 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>LT</td> <td></td> <td></td> <td></td> <td></td> <td></td>							LT					
Siloi         Divide         O         Divide			-			• =						
Si301         Pho95C         0         S0549         S0240         CDD         1.042         H05         UGS           Si301         Ph095C         0         S0649         S0249         FH         7.000         H06           Si301         Ph085C         0         S0649         S0259         FH         7.000         H06           Si301         Ph085C         0         S0649         S0220         CEC         4.000         H0         UGS           Si302         Ph038         122         S0049         S0220         CEC         4.000         H0         UGS           Si302         Ph038         122         S0049         S0224         CDD         1.420         H04         UGS           Si302         Ph038         122         S0049         S0249         FH         4.000         H0         UGS           Si302         Ph0397         0         S0047         S0081         M02         1.135         H0         K2           Si302         Ph0397         0         S0049         S0081         M02         1.135         H0         K2           Si302         Ph0397         0         S0049         S0082         S04 <td>S1301</td> <td><b>D</b>5036C</td> <td>0</td> <td>80049</td> <td>60089</td> <td>SN</td> <td></td> <td>1.500</td> <td>+00</td> <td>U66</td> <td></td> <td></td>	S1301	<b>D</b> 5036C	0	80049	60089	SN		1.500	+00	U66		
Si301         Phon5C         0         Son42         Son22         CDD         1.040         Host         UGG           Si301         Phon5C         0         Son42         Son249         FH         7.000         Host         UGG           Si301         Phon5C         0         Son42         Son	C1701	55/7 0	•	000.40	00000	604		4 700		шс <b>с</b>	11	2
Si301         NO30C         0         S0497         S0297         FH         7.000         +.00           Si301         UDRR         D5038C         0         S0049         S0059         CEC         4.000         +.00           Si301         UDRR         D5038         122         S0049         S0259         CEC         4.000         +00         NERG           Si302         D5038         122         S0049         S0252         HN3N2         6.400         +01         UG6           Si302         D5038         122         S0049         S0252         HN3N2         6.400         +01         UG6           Si302         D5038         122         S0049         S0247         FH         6.700         400           Si302         D50380         0         S0049         S0081         N03         LT         8.400         -01         UG6           Si302         D5039C         0         S0049         S0086         FB         9.000         +01         UG6           Si302         D5039C         0         S0049         S0020         CFC         2.509         +01         U66           Si302         D5039C         S0049			-								14	4
SI301         UDNR         D5038C         J         S0049         S0059         HN3N2         4.000         +00         HEGG           SI302         D5038         122         S0049         S0250         CEC         4.000         +00         HEGG           SI302         D5038         122         S0049         S0252         HN3N2         6.400         +01         UGG           SI302         D5038         122         S0049         S0249         PH         6.700         +00           SI302         D5038         122         S0049         S0249         PH         6.700         +00           SI302         D5038         122         S0049         S0249         PH         6.700         +00           SI302         D5039C         0         S0049         S0081         M03         LT         8.400         -01         UGG           SI302         D5039C         0         S0049         S0084         NN         4.000         -01         UGG           SI302         D5039C         0         S0049         S0020         CEC         2.500         +01         HEG           SI302         D5039C         0         S0049										000		
Si302         ICO38         I22         BO049         B0220         CEC         4.000         +00         nE0G           SI302         ICO38         I22         BO049         B0254         CDD         1.420         +04         UGG           SI302         ICO38         I22         BO049         B0252         HINN2         4.400         +00         UGG           SI302         ICO38         I22         BO049         B0249         FH         4.000         +00         UGG           SI302         ICO38         I22         BO049         B0249         FH         4.000         +00         UGG           SI302         ICO39C         0         BO049         B0081         NO3         LT         8.400         -01         UGG           SI302         ICO39C         0         B0049         B0086         SN         4.000         -01         UGG           SI302         ICO39C         0         B0049         B0082         SDA         1.010         +02         UGG         1         1           SI302         ICO39C         0         B0049         B0220         CEC         2.500         +01         IEG6         +1         1 <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			-									
S1302       D5038       122       80049       80254       CDD       1.420       404       UGG         S1302       D5038       122       80049       80245       PH       5.700       100         S1302       D5038       122       80049       80247       PH       5.700       100         S1302       D5039C       0       80047       80081       N02       1.135       190       UGG         S1302       D5039C       0       80047       80081       N02       1.135       190       UGG       1.0       K2         S1302       D5039C       0       80047       80081       N03       LT       8.400       -01       UGG         S1302       D5039C       0       80049       80086       SN       4.000       -01       UGG         S1302       D5039C       0       80049       80092       SO4       1.010       +22       UG6       +1       1         S1302       M6046       0       80049       80252       HTM2       4.000       -01       UG6         S1302       M6046       0       80050       80252       HTM2       1.000       +22       UG6												
Si202         DC038         122         S0049         S0052         HH3N2         4.400         +01         UGG           Si202         D5038         122         S0049         S0245         PH         6.700         +00           Si202         D50381         122         S0049         S0246         FH         6.700         +00           Si302         D5039C         0         S0049         S0086         FH         6.700         +01         UGG           Si302         D5039C         0         S0049         S0086         FE         9.000         +01         UGG           Si302         D5039C         0         S0049         S0086         FE         9.000         +01         UGG           Si302         D5039C         0         S0049         S0086         SN         4.000         +01         UGG           Si302         D5039C         0         S0049         S0220         CFC         2.500         +05         UGG           Si302         M6006         S0047         S0260         CDD         2.650         +05         UGG           Si303         D5047         S0260         CDD         2.650         +05 <t< td=""><td>S1302</td><td>1)5038</td><td>122</td><td>80049</td><td>80220</td><td>CEC</td><td></td><td>4.000</td><td>+00</td><td>MERG</td><td></td><td></td></t<>	S1302	1)5038	122	80049	80220	CEC		4.000	+00	MERG		
Si202         DC038         122         S0049         S0052         HH3N2         4.400         +01         UGG           Si202         D5038         122         S0049         S0245         PH         6.700         +00           Si202         D50381         122         S0049         S0246         FH         6.700         +00           Si302         D5039C         0         S0049         S0086         FH         6.700         +01         UGG           Si302         D5039C         0         S0049         S0086         FE         9.000         +01         UGG           Si302         D5039C         0         S0049         S0086         FE         9.000         +01         UGG           Si302         D5039C         0         S0049         S0086         SN         4.000         +01         UGG           Si302         D5039C         0         S0049         S0220         CFC         2.500         +05         UGG           Si302         M6006         S0047         S0260         CDD         2.650         +05         UGG           Si303         D5047         S0260         CDD         2.650         +05 <t< td=""><td>S1300</td><td>65073</td><td>177</td><td>20045</td><td>8075A</td><td>COD</td><td></td><td>1.420</td><td>+04</td><td>1166</td><td></td><td></td></t<>	S1300	65073	177	20045	8075A	COD		1.420	+04	1166		
S1362         D5038         122         S0049         B0249         FH         5.700         +00           S1362         D5038         0         B0049         E0036         AL         9.750         +03         UG6           S1362         D5039C         0         B0049         B0081         M02         1.135         +00         UG6         \$1.0         K2           S1362         D5039C         0         B0049         B0081         M03         LT         E.400         -01         UG6           S1362         D5039C         0         B0049         B0086         FE         9.000         +01         UG6           S1362         D5039C         0         B0049         B0086         SN         4.000         -01         UG6           S1362         D5039C         0         B0049         B0022         S04         1.010         +02         UG6         +1         1           S1362         M0066         0         B0049         B0250         CEC         2.500         +01         ME56           S1363         D5041         305         B0050         B0252         HN3N2         1.260         +00         S1303         D50420 </td <td></td>												
51360       160391       0       80049       60049       80081       M02       1.135       400       61       K2         51300       150390       0       80049       80081       M02       1.135       400       61       K2         51300       150390       0       80049       80081       M02       1.135       400       61       K2         51300       150390       0       80049       80086       FB       9.000       401       U66         51302       150390       0       80049       80086       SN       4.000       -01       U66         51302       150390       0       80049       80086       SN       4.000       -01       U66         51302       150390       0       80049       80220       CFC       2.500       +05       U66         51302       M0006       0       80050       80252       H13N2       1.200       +02       U66         51303       15041       305       80050       80253       C0D       7.250       +04       U66         51303       150420       0       80050       80249       FH       7.660       400										000		
S130-         D5039C         0         S0047         S0081         NO2         1.135         +00         066         +1.0         X2           S130-         D5039C         0         S0047         S0081         NO3         LT         S.400         -01         UG6         +1.0         X2           S1302         D5039C         0         S0047         S0084         FB         9.000         101         UG6         +1.1         105           S1302         D5039C         0         S0047         S0084         FB         9.000         101         UG6         +1.1         1           S1302         D5039C         0         S0047         S0260         CDD         2.659         +C5         UG6         +1.1         1           S1302         M0006         0         S0047         S0260         CDD         2.659         +C5         UG6         +1.1         1           S1302         M0006         0         S0050         S0252         HH3N2         1.200         +C2         UG6         +1.1         1           S1303         D5041         305         S0050         S0252         HN3N2         3.480         +2         UG6			-							006		
S1302       P5939C       0       80049       80081       NO3       LT       8.400       -01       UG6         S1302       P5939C       0       80049       80086       FB       9.000       101       UG6         S1302       P5939C       0       80049       80086       FB       9.000       101       UG6         S1302       P5939C       0       80049       80086       SN       4.000       -01       UG6         S1302       P5939C       0       80049       80082       SG4       1.010       +02       UG6         S1302       P5940       0       80049       80220       CFC       2.659       +05       UG6         S1302       P6906       0       80049       80252       HH3N2       1.206       +02       UG6         S1303       P5941       305       80050       80252       HN3N2       3.480       +02       UG6         S1303       P5941       305       80050       80252       HN3N2       3.480       +02       UG6         S1303       P5947C       0       80050       80284       AL       1.750       464       UG6         S1304											41 0	* 2
\$1302         150397         0         80049         80086         FB         9.000         401         UG6           \$1302         150397         0         80049         80086         SN         4.000         -01         UG6           \$1302         150397         0         80049         80086         SN         4.000         -01         UG6           \$1302         H9006         0         80049         80220         CEC         2.500         401         HE96         1           \$1302         H9006         0         80049         80220         CEC         2.500         401         HE96         1           \$1303         H5041         305         80050         80252         HR3N2         1.200         102         UG6           \$1303         15941         305         80050         80252         HR3N2         3.480         422         UG6           \$1303         15941         305         80050         80282         HR3N2         3.480         422         UG6           \$1303         15941         305         80050         80284         FH         7.666         400           \$1303         15941         3	51307	DC0 2A0	0	80047	80081	204		11100	1.00	000	*1•0	N.2
\$1302         15039C         0         80049         80086         SN         4.000         -01         UGG           \$1302         15039C         0         80049         80092         S04         1.010         +02         UGG         +1         1           \$1302         H0006         0         80049         80220         CFC         2.500         +01         ME06         +1         1           \$1302         H0006         0         80049         80250         CFC         2.500         +05         UGG         +1         1           \$1302         H0006         0         80049         80252         HR3N2         1.206         +02         UGG           \$1303         H5041         305         80050         80253         CDD         7.290         +04         UGG           \$1303         H5041         305         80050         80249         FH         7.666         +00           \$1303         H50420         0         80050         80249         FH         7.666         +00           \$1303         H50420         0         80050         80086         AL         1.703         +06         UGG           <	S1302	DS039C	.)	80049	80081	NO3	Lï	8.400	01	UGG		
\$1302       150390       0       80049       80086       SN       4.000       -01       UGG         \$1302       150390       0       80049       80092       S04       1.010       +02       UGG       +1       1         \$1302       10006       0       80049       80292       S04       1.010       +02       UGG       +1       1         \$1302       10006       0       80049       80252       HR3N2       1.206       +05       UGG         \$1303       10046       0       80050       80252       HR3N2       1.206       +0       UGG         \$1303       15041       305       80050       80253       CDD       7.290       -64       UGG         \$1303       15041       305       80050       80252       HN3N2       3.486       +1.55       K1         \$1303       15041       305       80050       80249       FH       7.666       +00       +1.55       K1         \$1303       150420       0       80050       80249       FH       7.666       +00       +1.55       K1         \$1303       150420       0       80050       80264       AL								9.000	+01	UGG		
\$1302       153392       0       80049       80092       S04       1.010       +02       UG6       +1       1         \$1302       M0006       0       80049       80220       CFC       2.500       401       ME26       1         \$1302       M0006       0       80049       80220       CFC       2.500       401       ME26       1         \$1302       M0006       0       80050       80252       HI3N2       1.206       H02       UG6       1         \$1303       M0006       0       80050       80253       C0D       7.290       -64       UG6         \$1303       D5041       305       80050       80252       HN3N2       3.486       472       U66         \$1303       D5041       305       80050       80252       HN3N2       3.486       472       U66         \$1303       D5041       305       80050       80249       PH       7.660       700       7.290       64       U66       411.5       K1         \$1303       D50420       0       80050       80084       AL       1.750       164       U66       411.5       K1         \$1303			-									
S1302         H0006         0         S0049         B0220         CEC         2.500         401         HE06           S1302         H0006         0         S0049         B0220         CEC         2.500         401         HE06           S1302         H0006         0         S0049         B0252         HH3N2         1.200         402         UG6           S1303         H0006         0         B0050         S0252         HH3N2         1.200         402         UG6           S1303         H541         305         B0050         B0253         C0D         7.270         4.64         UG6           S1303         D5041         305         B0050         B0252         HN3N2         3.480         4.92         UG6           S1303         D50420         0         B0050         B0249         FH         7.600         403         L1         8.400         4.01         UG6         41.55         K1           S1303         D50420         0         B0050         B0084         AL         1.7703         400         UG6         41.55         K1           S1303         D50420         0         B0050         B0084         SN <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>+02</td><td></td><td>+1</td><td>1</td></t<>									+02		+1	1
S1301       M6006       0       S0007       S0200       CDD       2.650       HC       M60         S1301       M6006       0       S0047       80260       CDD       2.650       HC       UGG         S1302       M6006       0       S0049       80252       HH3N2       1.200       HO       UGG         S1303       L5541       305       80050       S0253       CDD       7.290       -64       UGG         S1303       D5041       305       80050       80252       HN3N2       3.480       402       UGG         S1303       D5041       305       80050       80252       HN3N2       3.480       402       UGG         S1303       D5041       305       80050       80249       FH       7.66       #00         S1303       D50420       0       80050       80249       FH       7.750       404       UGG         S1303       D50420       0       80050       80284       AL       1.757       404       UGG         S1303       D50420       0       80050       80084       SN       6.000       -01       966         S1303       D50420       0<			-									-
\$1302       m6008       0       80049       80252       HH3N2       1.200       402       UGG         \$1302       M0006       0       80050       80252       HH3N2       1.200       402       UGG         \$1303       H5041       305       80050       80252       HH3N2       3.480       400         \$1303       H5041       305       80050       80252       HH3N2       1.703       404         \$1303       H50410       0       80050       80086       AL       1.750       404       UGG         \$1303       H50420       0       80050       80086       FB       1.703       406       405         \$1303       H50420       0       80050       80086       FB       1.706       402       UGG         \$1303       H50420       0       80050       800820       612	21201	10000	~	00047	00020	01.0		2.000		11200		
\$1302       H0008       0       80050       80249       PH       6.800       400         \$1303       1'5541       305       80050       80253       CDD       7.270       -04       U66         \$1303       1'5541       305       80050       80252       HN3N2       3.480       402       U66         \$1303       1'5041       305       80050       80252       HN3N2       3.480       402       U66         \$1303       1'50420       0       80050       80249       PH       7.660       404       U66         \$1303       1'50420       0       80050       80249       PH       7.660       404       U66         \$1303       1'50420       0       80050       80084       AL       1.750       404       U66         \$1303       1'50420       0       80050       80084       PB       1.700       402       U66         \$1303       1'50420       0       80050       80086       \$N      000       -01       U66         \$1303       1'50420       0       80050       800820       EC       1.700       402       U66         \$1303       1'50420	S1300	<b>N</b> 0006	0	80947	80260	COD		2.650	+05	066		
\$1303       1'5941       305       80050       80253       C0D       7.290       -04       UGG         \$1303       15041       305       80050       80252       HN3N2       3.480       402       UGG         \$1303       15041       305       80050       80252       HN3N2       3.480       402       UGG         \$1303       150420       0       80050       80249       FH       7.666       409         \$1303       150420       0       80050       80086       AL       1.750       464       UGG         \$1303       150420       0       80050       80086       AL       1.703       406       UGG         \$1303       150420       0       80050       80081       403       LT       8.400       411       5       61         \$1303       150420       0       80050       80086       \$N       6.000       41       96       61       51       66       61       60       61       66       61       61       61       61       61       61       61       61       61       61       61       61       61       61       61       61       61	51302	M0006	0	80049	80252	HN3N2		1.200	+02	UGG		
\$1303       15041       305       80050       80253       C0D       7.290       -04       UGG         \$1303       15041       305       80050       80252       HN3N2       3.480       402       UGG         \$1303       15041       305       80050       80252       HN3N2       3.480       402       UGG         \$1303       15041       305       80050       80249       FH       7.600       409         \$1303       150420       0       80050       80086       AL       1.750       404       UGG         \$1303       150420       0       80050       80081       403       L5       8.400       401       966         \$1303       150420       0       80050       80081       403       L5       8.400       401       966         \$1303       160420       0       80050       80086       SN       6.000       401       966         \$1303       160420       0       80050       80082       504       1.700       402       966         \$1303       160420       0       80050       80082       504       1.130       402       1.606       41       7<	\$1302	M0006	0	80050	80249	FH		6.800	+00			
S1303       D5041       305       80050       80252       HN3N2       3.480       402       400         S1303       D5041       305       80050       80249       PH       7.660       700         S1303       D50420       0       80050       80249       PH       7.660       700         S1303       D50420       0       80050       80086       AL       1.750       404       U66         S1303       D50420       0       80050       80081       903       LT       8.400       -01       966         S1303       D50420       0       80050       80084       FB       1.703       402       U66         S1303       D50420       0       80050       80084       SN       6.000       -01       966         S1303       D50420       0       80050       80084       SN       6.000       -01       966         S1303       D50420       0       80050       800820       FB       1.700       402       U66         S1303       D50420       0       80050       80220       FEC       1.600       +1       -9         S1303       D50101       2744 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>7.290</td> <td>+ 0 A</td> <td>UGG</td> <td></td> <td></td>								7.290	+ 0 A	UGG		
\$1303       D5042C       0       80050       80086       AL       1.750       404       UG6         \$1303       D5042C       0       80050       80081       903       LT       8.400       -01       966         \$1303       D5042C       0       80050       80081       903       LT       8.400       -01       966         \$1303       D5042C       0       80050       80086       FB       1.700       402       966         \$1303       D5042C       0       80050       80086       SN       6.4000       -01       966         \$1303       D5042C       0       80050       80086       SN       6.4000       -01       966         \$1303       D5042C       0       80050       80086       SN       6.4000       -01       966         \$1303       D5042C       0       80050       80082       SN       6.4000       -01       966         \$1303       D5042C       0       80050       80082       SN       6.4000       -01       966         \$1303       D5042C       0       80050       80220       EC       1.6002       +1       +9       5166												
\$1303       150420       0       80050       80086       AL       1.750       404       UG6         \$1303       150420       0       80050       80081       903       1.703       404       UG6         \$1303       150420       0       80050       80081       903       LT       8.400       -91       906         \$1303       150420       0       80050       80081       903       LT       8.400       -91       906         \$1303       150420       0       80050       80086       FB       1.709       402       906         \$1303       150420       0       80050       80086       SN       6.000       91       906         \$1303       150420       0       80050       80086       SN       6.000       91       906         \$1303       150420       0       80050       800820       504       1.130       492       906         \$1303       150420       0       80050       80220       4EC       1.6006       414       .9         \$1303       100420       0       80050       80220       4EC       1.6006       404       406       406												
\$1303       D504/C       0       80050       80051       N02       1.703       106       115       K1         \$1303       D504/C       0       80050       80081       903       LT       8.400       -01       966       1.703       966       1.703       966       1.703       966       1.703       1.703       966       1.703       966       1.703       966       1.703       1.703       966       1.703       966       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.703       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713       1.713 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>												
S1303       D50422       0       B0050       B0081       403       LT       8.400       01       056         S1303       D5042C       0       B0050       B0086       PB       1.700       402       UG6         S1303       D5042C       0       B0050       B0086       PB       1.700       402       UG6         S1303       D5042C       0       B0050       B0086       SN       6.6000       01       UG6         S1303       D5042C       0       B0050       B0092       S04       1.130       402       UG6         S1303       D5042C       0       B0050       B0092       S04       1.130       402       UG6         S1303       D5042C       0       B0050       B0220       EC       1.000       405       1.97         S1303       M04070       0       B0050       B0282       0007       2.586       405       UG6         S1303       M0407C       0       B0050       B0282       HM3N2       1.930       4.6       UG6         S1304       M0407C       0       B0050       B0249       F0       2.300       4.6       UG6         S1304 <td>S1303</td> <td>16042C</td> <td>0</td> <td>80050</td> <td>6003</td> <td>AL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	S1303	16042C	0	80050	6003	AL						
\$1303         100420         0         80050         80086         PB         1.700         102         UGG           \$1303         100420         0         80050         80086         SN         \$.000         01         066           \$1303         1050420         0         80050         80086         SN         \$.000         01         066           \$1303         1050420         0         80050         80082         \$.04         \$.130         \$.02         \$.130         \$.060         \$.01         0.60         \$.130         \$.000         \$.130         \$.000         \$.01         \$.060         \$.01         \$.060         \$.01         \$.060         \$.01         \$.060         \$.01         \$.060         \$.01         \$.060         \$.01         \$.060         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.01         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000         \$.000	\$1303	DS04./C	0	800%)	80091	NO2			196		+115	K1
\$1303       D5042C       0       80050       80086       \$N       \$0.000       01       066         51503       D5042C       0       80050       80092       \$04       1.130       \$02       066       \$1       .7         \$12.7       D5131       274       20049       80220       \$EC       1.000       \$016C       \$1       .7         \$12.7       D5131       274       20049       80220       \$EC       1.000       \$016C       \$1       .7         \$12.7       D5131       274       20049       80220       \$EC       1.000       \$016C       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1       \$1	S1303	B56420	Ú	80050	80081	N03	LT	8,400	<ul> <li>1</li> </ul>	966		
51303       100420       0       80050       80092       504       1.130       F02       UGC       +1       .9         51303       100131       274       80049       80220       EC       1.000       F01       1606         51303       100020       8       80050       80262       C0D       2.560       F05       UGC         51303       100020       9       80050       80262       C0D       2.560       F05       UGC         51303       100020       9       80050       80252       HM3N2       1.930       F05       UGC         51303       100020       9       80050       80252       HM3N2       1.930       F05       UGC         51304       100020       9       80050       80270       CFC       2.300       F0       1600         51304       100444       105       80050       80270       CFC       1.200       F0       FEGG         51304       100444       105       80050       80253       000       2.700       94       UGG	S1303	1950 <b>420</b>	0	80050	80086	F'B		1.700	405	UGG		
51303       100420       0       80050       80092       504       1.130       F02       UGC       +1       .9         51303       100131       274       80049       80220       EC       1.000       F01       1606         51303       100020       8       80050       80262       C0D       2.560       F05       UGC         51303       100020       9       80050       80262       C0D       2.560       F05       UGC         51303       100020       9       80050       80252       HM3N2       1.930       F05       UGC         51303       100020       9       80050       80252       HM3N2       1.930       F05       UGC         51304       100020       9       80050       80270       CFC       2.300       F0       1600         51304       100444       105       80050       80270       CFC       1.200       F0       FEGG         51304       100444       105       80050       80253       000       2.700       94       UGG	04747				•							•
>12.1       05131       274       20049       80220       FEC       1.000       FE06         \$1303       M0.070       0       80050       80262       000       2.560       F05       UGG         \$1303       M0.070       0       80050       80262       000       2.560       F05       UGG         \$1303       M0.070       0       80050       80252       HM3M2       1.930       F05       UGG         \$1304       M0.800       0       80050       80270       CFC       2.300       F0       F00         \$1304       M0.800       0       80050       80270       CFC       1.200       F0         \$1304       M0.844       103       80050       80270       CFC       1.200       F0       F06         \$1304       M0.444       103       80050       80270       CFC       1.200       F01       F06												•
\$13-3         MC-070         B         \$6050         \$0262         COD         2.580         +05         UGG           \$1303         NOUNTC         9         \$0050         \$0252         NA3N2         1.930         +05         UGG           \$1304         MC-070         0         \$0050         \$0249         FD         2.560         +05         UGG           \$1304         MC-070         0         \$0049         \$0270         CFC         2.300         +01         ME00           \$1304         MC-044         105         \$0050         \$0253         0.00         2.700         94         UGG											+1	• 9
\$1303         nome()         0         00050         00252         00382         00382         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930         0.930 <th0.9< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th0.9<>												
S1000         MODPL         O         S0050         80249         FN         7.500         FOD           S1300         MODPL         O         S0050         80220         CFC         2.300         FD         MED0           S1300         MODPL         O         S0049         80220         CFC         2.300         FD         MED0           S1304         MODPL         80050         80220         CFC         1.200         FD         MED0           S1304         MODPL         80050         80253         COU         2.700         V4         UGG												
5130- MC 850 0 80049 80200 CFC 2.300 FC ME00 01504 US-44 105 80050 80200 CFC 1.200 FC ME06 51304 US-44 153 80050 80253 COD 2.700 04 UG6	51303	n6++++10		80050	30252	110-3142		1.930	+s. €	066		
5130- MC 850 0 80049 80200 CFC 2.300 FC1 MEDO 01504 US-44 105 80050 80200 CFC 1.200 F01 MEDO 51304 IN-44 IN-5 80050 80253 CON 2.700 94 UG6	× 1	Mar. 19		60057	007 <b>4</b> 9	£11		2.560	+(0)			
01304 (05-44 103 80050 80220 EFC 1,200 00 MEGG 01304 (05-44 103 80050 80223 000 2,700 04 UGG										MEDIC		
S1304 (M-44 HEC 80050 20253 COB 2.700 94 UGG												
21 A4 - 12 12 103 BOODA 80120 HURNS - 2+240 +A2 000												
	51 194 1	1. 14	4403	80050	80212	HD (N2		2+240	* '2 L	000		

.

#### SITE TYPE: LAKE WISCONSIN-SEDIMENT

,

.

.

÷.

F	·A(	÷F	:	2

SITE IDENTIFICATION	SAMPLE NUMBER	SAMPLE DEPTH	SAMFLING DATE	ANALYSIS DATE	PARAMETER TEST NAME		MNTSA	EXP			
두려 한 후 것 및 것 및 것 및 것 및 것 을 수	====		*******	******	20.2222244	27222					
S1304	05044	183	80050	80249	£'Н		7.200	+00		-	
S1304 S1304	050450	16.5	80050	80086	AL		2.300	+04	UGG		
S1304	DS0450	ŏ	80050	80.081	NU2		1.362	100	UGG	+1.2	κ2
S1304	15045C	0	80050	80081	N03	LT	8.400	-01	UGG		
51304	DSC45C	ő	80050	80084	F B	<b>L</b> :	2.450	+02	UGG		
51304	00(400	v	80000	60000			L • 7 .3 V	102	000		
S1304	D5045C	0	80050	80086	SN		1.000	+00	UGG		•
S1304	D5045C	ō	80050	80092	S04		3.800	+02	មថថ	+5	.3
S1304	M0010	0	80050	80220	CEC		2.800	+01	MERC		
S1304	M0010C'	Ō	30050	80260	COD		4.830	+ 35	UGG		
S1304	M0010C	õ	80050	80252	HN3N2		5.150	+02	UGG		
		_				٠					
S1304	M0010C	0	80050	80249	PH		6.900				
S1305	05047	122	80050	80220	CEC		6.000	+00	MEQG		
\$1305	DS-)47	122	80050	80260	030		6.900		UCC		
S1305	05047	122	80050	80252	HN3N2		1.020	+92	006		
\$1305	D5047	122.	80020	80249	FH		6.000	100			
\$1305	B50480	0	\$0050	80086	AL		1.000	194	UG <b>G</b>		
51305	D50480	õ	80050	80262	COD		1.250	+05	UGG		
91305	050480	ő	80050	80081	N02	L1	5,300	-01	UGG		
\$1305	150480	ů.	80050	80081	NH13	11	8.400	-01	666 666		
S1305	150450	ŏ	80050	80085	PB	• •	1,500	+62	000		
27 E Q 27 1	10.5 % 10	V	20031	00000	r tr		1.1		00.17		
S1305	D5048C	o	80050	80086	SN		7.000	-01	មចច		
\$1305	D5048E	0	80050	80092	S04		1.460	+⊴2	UGG	÷2	.7
S1305	M0012	0	80050	80220	CEC		2,990	+01	MERG		
\$1305	M0012	0	80050	60260	C 0 D		5.110	+05	000		
\$1305	h0012	0	3050	80252	1073 NH		2.860	403	066		
64 <b>7</b> 56											
S1305	MOOIE	0	80050	80249	ĽН.		5.500	+00			
S130a	P5050	183	80050	80220	UEC		1.500	+01	MEQG		
S1308	16050	183	S0050	80254	COD		5.260	+64	066 066		
S1305	B5050	183	80050	80252	HU3N2		6.080		UGG		
S1306	D5K5-0	163	80050	80249	F'H		7.300	+10			
S1300	150510	0	80050	80085	AL		2.550	+04	066		
S1305	BS-051C	ő	80050	80081	002	1.1	6.300	01	IJĞĞ		. •
\$1304	150510	ő	80050	30081	1103	2.1	8.4.0	61	UGG		
51305	15 510	U U	80050	80086	5P		2.200	102	000		
51304	16.0510	ě	30050	80086	30		400	: 37	000		
01306	D200040	0	80000	89072	~ U-1		1.490	-	UGC	+2	.7
S1365	<b>M</b> (44-10)*	<u>0</u>	22000 <sup>45</sup>	80260	1.00			÷9*•	066		
51306	MC+++30	Ú.	80050	30252	HUGN2		3 - 224	172	066		
51308	n. 190		80650	ି <b>0</b> 24 ∕	· +1		$\phi_{1}$ and $\phi_{2}$	+99			
S1307	m10(13	ò	8097) Q	80220	_F1		1.090	+01	MENG		
S1302	105053	195	00050	80,220	1.5		n.000	6. <u>1</u>	mEQG		
51307 51307	1050053 105053	183	8005	80262	1.00		4.950		000		
S1307	10000 [15053	183	80050	80252	HNENT		1.020		066 066		
51307	1000 IS 1054 93	185	80000		EH.		", soc	40.0	000		
				80249 00004	61 61			102	966		
D1302	050°40	42 - C	80050	80086	ei.		5,380	10.	100		

•

#### SITE TYPE: LAKE WISCONSIN-SEDIMENT

f

.

٠

SITE IDENTIF: CATION	SAMPLE NUMBER	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS Date	PARAMETER Yest NAME	BOOL	HNTSA	E XF			
	2532 <b>5</b> 3	***125	*******	********		<b>H</b> 2222					
51307	D5054C	0	80050	80091	NC		1.700	+05	UGG		
S1307	050540	ŏ	80050	80035	10		9.000	+01	UGG		
S1307	D5054C	ŏ	80050	80033	SN		4.000	+00	500		
51307	05054C	õ	80050	80092	504		2.280	+02	UGG	+3	. 4
\$1307	M0015	ŏ	80050	80254	cos		5.940	+05	UGG		
S1307	M0015	0	80050	80249	ГH		7.000	+00			
S1307-WDNR	DS054C	ŏ	80050	30059	HN3N2		1,450	+03	UGG		
91308 91308	05055	õ	30050	80220	CEC		9.000	+00	MEQG		
S1308	D5055	ŏ	80051	30260	COD		2.090	+04	UGG		
\$1308	D5055	ŏ	80051	80252	HN3N2		8.400	+01	UGG		
04760	5.5 ACE	<u>^</u>	00051	00010	FH		6.300	÷00			
S1308	05055	0	80051	80249	COD		1.240	+03	U66		
S1308	05056	122	80051	80242		LT	1.300	+01	UGG		
S1308	15056	122	80051	80252	HN3N2	<b>L</b> I	6.200	+01 +00	000		
S1308	D5056	122	80051	80249	₽H.		4.250	+00	066		
S1308	D5057C	0	80051	80086	AL		4+200	در ۲	006		
S1308	050570	0	80051	80081	NOC		1.710	+00	UGG	+1.5	К1
\$1308	050570	ŏ	80051	80091	103	LT	8.400	-01	UGÇ		
51308	150570	č	80051	80086	F15		1.500	401	UGG		
\$1308	050570	ō	30051	80086	SN		1.300	+ 20	បចច		
\$1308	D0000/C	Q	20051	80072	\$64		4.55%	20 <b>1</b>	1166	+.5	2
S1308	D5156	61	80051	80220	CEC		1.500	101	MEQG		
S1309	05058	0	30051	80220	ÊÊÛ		2.900	+01	MEQG		
51307	05058	õ	80051	80252	HN3N2		3.180	+32	UGG		
51309	05058	ŏ	80051	80249	FH		6.900	+ 20			
31309	05059	51	80051	80220	CEC		1.900	+01	MEGG		
91309	D5059	61	80051	80253	COD		5.41)	+04	UGG		
\$1309	D5059	51	80051	80252	HR3N2		2.730	192	UGG		
51309	1:5059	61	80051	80249	F'H		7.000	+00			
51309	D2080	0	80051	80035	ΑL.		1.400	+04	UGG		
51309	050500	0	80051	80081	NÚ2		1.362	+00	UGG	+1+2	K2
31309	D0000C	o	80051	80081	(40.3	LT	8.400	-01	UGC		
S1309	100000C	0	80051	80080	<b>B</b>		8.500	F01	UGG		
81309	D5660C	0	30051	80086	5 M		2.000	- 91	000		•
S1309	05640C	0	80051	80092	504		1.930	402	ปษัต	+2	.5
51310	D0981	Ú	80051	80220	CEC		3.00-	+91	HEQG		
81310	D5061	ú	80051	80254	· 00		8.3.0	+04	UGG		•
* 1 <b>3 1</b> 1	D.S.O. J	ι, i	80651	80252	60.502		1.020	+03	066		
31310	05051	0	80051	80240	÷ +1		2.000	4.0.2			
01310	15062	51	8005:	80220	CF o		2.700	101	MENG		
S1310	B56.62	÷1	80051	80254	លម្		6.4.0	- 04	050		
81310	05062	61	80051	80252	HREND		5.850	192	U06		
\$1310 \$1310	10.0001	61 61	80051	00249	E H		5.800	+: 6			
\$1310	15062		80051	80085	AL		1.550	104	066		
\$1310	05083C	ې ن	89051	80081	802		1.135	900	UGG	+1.0	1.2
S131	150630	, i i i i i i i i i i i i i i i i i i i	80051	30081	NG3	1.1	8.400	-01	UGG		–
STOL .	1000000	~		Que en que			-				

PAGE: 3

#### SITE TYPE: LAKE WISCONSIN-SEDIMENT

1

.

.

.

SILE IDENTIFICATION	SAMPLE NUMBER	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS DA FE	PARAMETER TEST NAME	BOOL	MNTSA		ULTS	ACRY	PFEC
EBETERSTATES				*=====		======			ac×322		*****
<b>A</b> · <b>A</b> · <b>A</b>				~~~~						•.	
S1310	D5063C	0	80051	80085	FB		4.500	+01	UGG		
51310	L2033C	0	80051	80086	SN		1.000	+00	UGG		
\$1310	DS063C	0	80051	80092	504		7.30	+01	UGG	+1	1
S1311	10064	0	30051	80220	080		1.600	- 31	MERG		
S1311	105064	0	80051	80254	COD		6.350	+04	UGG		
S1311	05064	0	80051	80252	HN3N2		1.900	+02	UGG		
S1311	05064	ŏ	80051	80249	FH		6.900	100	000		
51311	D5045	51	80051	80220	CEC		1,100	+01	MEQG		
				80220	COD		1.190	+04	UGG		
S1311	D5065	61	80051					+02	UGG UGG		
\$1311	D5065	61	80051	80252	HN3N2		1.720	+02	000		
51311	BS065	61	80051	80249	F'H		6.000	+00			
S1311	D2066C	0	80051	80086	AL		1.000	+04	UGG		
S1311	D3066C	0	80051	80081	N02	LT	6.300	- 01	UGG		
S1311	050660	ō	80051	80081	NO3	LT	8.400	+ 91	UGG		
S1311	050666	ō	80051	80086	F'B	• •	2.500	+01	UGG		
51511	100000	v	00001	00000			2.00.7				
S1311	D5066C	0	80051	80086	SN		7.000	- 01	UGG		
S1311	050660	0	80051	80092	504	LT	1.000	+01	UCG		
S131.2	05067	0	30051	80220	CEC		1.500	+01	MERIG		
S1312	15067	ŏ	80051	80254	COD		5.950	+04	066		
51312	05067	ŏ	80051	80249	FIL		6.500	+ 20			
- A 2 A -	00461	v	6.00.01	0024							
S1312	PS068	61	80051	80220	CEC		1.400	+01	MEOG		
<b>S1312</b>	05068	61	80051	80254	COD		2,590	+04	UGG	•	•
S1312	D5038	61	80051	80252	HN3N2		8.800	+01	UGG		
\$1312	05068	61	80051	80247	FH		6.300	+00			
S1312	DS069C	ō	80051	20036	AL.		1.0	+04	UGG		
S1317	150690	0	80051	80091	NC		6.000	-02	<b>UG</b> 6		
S13)2	NS069C	0	80051	80081	N02		1.13%	400	UGG	+1.0	K 2
S1310	US069C	0	80051	80081	ND.3	- L.T	8.400	~01	UGG		
S1310	D5069C	0	80051	80085	- E		2.500	+01	UGG		
S1312	100590	0	80051	80036	SH		1.100	+ 20	066		
04745	P.P. A. C. Mark		634F4	60000							
81310	D2069C	0	80051	80092	S04		6.700	+01	066	+1	1
S131. WDNR	D2028C	0	80051	80057	HM3N2		2.97.4	F02	UGG		
S1313	m0018	0	29317	80260	COD		2.040	105	066		•
\$1313	n6018	0	79319	80252	H#302		3.100	+02	UGG		
S1313	n0018	Ŷ	79319	80249	£Н		6.40	4 OC			
S1314	60017	0	79319	80086	AL		2.129	. 93	UGE		•
51314	80017	ŏ	79319	80260	(1)[1		1.1	1.74	000		
S1314	M-017	o o	79310	80091	11		1.30	1	006		
51314	MGG17	0	79319 79319	80091	N02	Lĩ	6.300		1/66		
81314	m0017	Ŭ.	79314	80081	d1)3	L. 7	8.39	61	UGC		
51317	n0017	v	7931 -	30086	F.B.		3.000	+ 11	906		
11314	me01 *	-O	79319	80249	£Н		6.4 20	190			
51314	n0017	0	7931-	80085	54		7.000	-01	066		
S1314	N:017	ō	79319	80092	504		5.32%	+01	نزال	+.75	2
5 1 1 1 1 1		v									-

#### FAGE: 4

.

#### SITE TYPE: SURFACE SOILS

.

4

SITE IDENTIFICATION	SAMPLE NUNZER	SAMPLE DEPTH	SAMFLING DATE	ANALYSIS EATE	PAPAMETER TEST NAME	BOOL	MNISA	ExF	ULTS UNIT		PREC	
S1402	05002	0	79324	80086	AL		9.000	+03	UGG			
\$1402	05002	ŏ	79324	80081	NO2		9.420	400	UGG	+8.6	C2	
31402	<b>B2002</b>	0	79324	80081	N03	LT	6.400	- 01	UGG			
S1402	05002	0	77324	80088	E'B		5.800	: +2	UGG			
\$1402	£5662	0	79324	80086	58		8.500	+00	UGG			
S1402	D5002	Ŭ	79324	80092	564		2.530	+ 21	UGG	+.3	4	
S1404	DS033	0	80042	80036	AL.		6.750	+ 13	UG6			
51404	05033	0	80042	S0086	ŃG		4.460	4.00	000			
S1404	D5033	0	80042	80086	SN		2,950	+-90	UGG			
51404	M0054	10	80192	80200	NG	LT	1.300	-01	UGG			
S1404	<b>W</b> 0020	45	80042	80084	AL.		1.500	+03	UGL			
51404	<b>W</b> 0020	45	80042	80085	NG -	LT	1.100	+ J l	បចច			
S1404	<b>₩</b> 0620	45	80042	80066	N0.2	LT	2.500	-51	MGL			
S1404	<b>W</b> 0020	45	80042	30055	N02	L î	2.500	• • •	nGL			
S1404	W0020	45	80042	80066	N02	LT	2.500	-01	MGL			
S1404	<b>W9</b> 0.0	45	80042	30056	NOC	LT	2.500	-01	MGL			
51404	M0-20	45	80042	80056	NOS	LI	3.600	- 17	MGL			
S1404	W0079	45	80042	80053	MD 3	Li	3.000	· 21	MGL			
S1404	<b>W</b> 00.00	45	80042	80050	NG3		4.400	- 01	MGL.	29		
S1404	₩0620	40	©⊕0 <b>42</b>	50065	NO3		4.400	$\sim 1$	MGL	29	27	
S1404	W0070	45	80042	80084	F18		2.100	+62	UGL	- 7	.4	
S1404	W0020	45	8004.2	30084	SN	LT	1.800	+ 31	UGL			
S1404	<b>W</b> 0020	45	80042	30058	304		1.800	+ )1	MGL	5	13	
51404	WOOSO	76	80192	80200	NĜ	LT	1.100	+01	UGL			
S14C8	D2008	v	79324	80085	AL		3,500	. 23	UGG			
51408	BEOOS	0	79324	80081	1002	LI	6.30Ú		UGG			
51498	16008	0	79324	80081	ND3		2.500	100	06G	+.42	14	
S1408	P5008	0	79324	80088	F B		1.220	1.1	UGG			
51408	05008	0	79324	80086	SN		6.650		UGG			
S1408	<b>1</b> 6998	Ú.	79324	80092	504		3.140	+91	066	1.4	3	
51407	115009	0	79325	80086	nL.		5.500	193	UGG			
814-09	<b>D</b> 2009	0	79325	80081	14:42	1 T	6.300	01	UGG			
51402	12.000	Ó	79328	20081	N03	Ll	8.400	- 1	UGG		. •	
51405	25002	- U	193.25	80038	61 <b>E</b> )		9.200	+ ( )	1166			
51409	$\mathbf{D}_{1}^{1}(\mathbf{r})(\mathbf{r})$	0	79028	5008a	Сu		2.500	+ PO	ប្រចប			
S1409	D2009	U.	79325	80090	531		2.530	• :	060	+.3	4	
51310	DS First		793.15	30085	ы.		1.000	2.54	UGU			
51410	11 C 12		79315	30091	U(0)		4.300	1 1	UGIS			
5141.	10522.2		79324	30088	6 B		1.259	•· _	066			
53416	$D^* \otimes U_{\mathcal{F}}$	1)	79.725	30688	.1 <sup>1</sup>		·0.800	+ <u>-</u> -	060			
101 3111	ph. 10	ţ.:	29325	00012	5.00		5.360	: . :	واران.	+.c	2	
1-11	Disco de la		22.25	Barrison	ăt.		2.000	140.0	066			
51411	12.0011	0	29325	SUCC1	102		1.510	+ + E	066	114	62	
21411	1 1	• •	79325	80081	NULS		1.420	, soj	UGC	+.09	22	
51411		•5	79325	30080	¥.f.		1.585	6.24	Սնե			
										•		

PAGE: 1

PAGE: 2

#### SITE TYPE: SURFACE SOILS

٠

C

1

1

.

	SITE IVENTIFICATION	SAMPLE	SAMPLE DEPTH	SAMFLING DATE	ANALYSIS DATE	PARAMETER TEST NAME	BOOL	NNTSA	F CP		ACRY	
									_			
	S1411	P5011	ę .	79325	60086	SN		1.210	+03	UGG		
	S1411	D5011	Ú,	79325	80092	S04		2.530	+01	UGG	+.3	4
	S1413	10013	0	79330	80085	AL.		8.875	193 20 <b>4</b>	UGG UGG		
	S1413 S1413	D5013 D5013	C O	79330 79330	00091 80088	NC FB		3.400 3.550	+92	UGG UGG		
	51413	10013	0	77330	60000	ΓĿ		3.330	1.7	000		
	S1413	P5013	0	79330	80086	ΘN.		2.400	+00	UGG		
	31413	09013	Ö	79330	80092	\$04		4.680	+02	UGG	+5.5	• 2
	S1413	W0051	10	80185	80197	ALDRN	LT	3.300	- 02	UGL		
	51413	W0051	10	80185	80197	FCB016	LT	1.100	1.00	UGL		
	S1413	W0051	10	80185	80197	FCB221	LT	3.000	÷÷O	UGL		
	S1413	W0051	10	80185	80197	PCE232	LT	2.400	+00	UGL		
in the	S1413 S1413	WOU51 10で51	10	30185	80197	PCE232	L.1	1.300	100	UGL		
hale from	51413 S1413	W0051	10	80185	80197	FCE248		7.000	- 01	UGL		
JUM COM		W0051	10		80197	PCB254	LT	2.400	+.00	UGL		
1 1 1 1 2 1 1 1 1	S1413 S1417	W0051 W0051	10	80185 80185	80197	PCB260	LT	2.300	+-212	UGL		
Densie unter Versteinst (2001 (2001) (2001)	S1413	W0001	10	00130	8017	1 L D 2 O V	<b>L</b> 1	1.000	15.7	UCL		
12 million	S1413	W0051	10	80185	80197	ABHC	LT	1.700		UGL.		
1.15)	S1413	W0051	10	80185	80197	BEHC	LT	3.500	- 22	UGL		
and for the second	S1413	W0051	10	80185	80197	DEHC		1.400	<b>1</b>	UGL		
	31413	W0051	10	80185	80197	CLDAN	LĨ	1.100	- 01	UGL		
	S1413	WO051	10	80185	80197	DL DERI	iΤ	1.600	-01	UGL		
	S1413	W0051	10	80185	80197	ENDRN		6.500	-02	UGL		
	\$1413	W0051	10	80185	80197	AENSLE	LT	2.500	- 62	UGL		
	S1413	W0051	10	80185	80197	BENSLF	LT	6.400	-2.2	UGL		
	S1413	W0051	10	80135	80197	HFCL	LT	1.200	- 01	UGL		
	S1413	W0051	10	80185	80197	LIN	LT	2.800	02	UGL		
	S1413	W0051	10	80185	80197	FFPDD	LT	6.300	)2	UGL		
	51413	WG051	10	80185	80197	FFDDE	L T	1,100	-01	UGL		
	S1413	W0001 W0001	10	80185	80177	PPDDT	LT	7,200	-02	UGL		
	S1413	W0051	10	80185	80197	TXPHEN	L.T	8.900		UGL		
	51414	DS014	0	79330	80086	AL.	<b>L</b> '	6.750	100	UGG		
	51414	05014	o	79330	80081	NO2		2.610	+00	UGG	+2.4	C8
	S1414 S1414	DOV14 D5014	0	79330	80081	NU. NO3	LT	8.400	-01	UGG	74.9	60
	51414	105014 105014	- 0 0		80038	NO3 FP	L. I	8.400	+01	000 000		•
				79330								
	51414	15014 15014	0 0	79330	80088 80092	SN 504		6.000 2.990	-01 +0.1	UGG UGG	+4	.3
	51414	00014	)	79330	- B00A5	504		2.970	+0.1	066	<del>14</del>	. 3
	81415	14-01-5	ė.	79330	80036	Au.		5.325	+03	<b>UG</b> 6		
	5141	$\Gamma^{*}(e) \Gamma^{*}(e)$	a .	79330	80691	840°		1.100	21	UGG		
	1111	147.00 L * 6	4)e	79336	20601	NUL		1.360	+ 2Q	1166	+1+2	К2
	S1415	14.15	2	79330	80081	103		9.630	- 01	UGG	+.06	33
	01419	$\mathbf{P}_{\mathbf{r}} \in \mathbb{N}_{\mathbb{N}}$	· ·	<b>793</b> 30	80088	0.F.		4.500	+'. 1	tiGG		
	51415	frt einen	. (	2 <b>9</b> 3/10	50085	.11		9.000	;	055		
	51415	EC 1	.)	793.44	80092	14		1.520	++++	96 <b>6</b>	+	7
						• • •					•	

.

# ANALYTICAL DATA SUMMARIZED BY TEST NAME

· • .

PARAMELER: ABHC

.

ŧ

•

SITE	SAMPLE	SAMPLE	SAMPLING	ANALISIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	BATE	ROOL	MNTSA	EXF	TINU	ACRY	PREC
*************	*****	*****				*******	<b>3</b> 2228		*****	*****
\$1102	A0056	1674	80183	30197	LT	1.700	-01	UGL		
S1104	A0068	2543	80183	80197	LT	1.700	-01	UGL		
S1107	A0053	1936	30184	80197	LT	1.700	-01	UGL		
S1123	A0052	3782	80190	80197	LT	1.700	-01	UGL		
S1137	A0073	5456	80190	\$0197	LT	1.700	-ú1	UGL		
51413	W0051	10	80185	80197	LT	1.700	-01	UGL		

•



PARAMETER: AENSLF

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			<b>FES</b>	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	EXF	UNIT	ACRY	PREC
	*****			*******	525 <b>5</b> 2	* ******	*==**	=====		******
S1102	A0066	1674	80183	80177	LT	2.500	-02	UGL		
51104	A0063	2543	80183	80197	LT	2.500	-02	UGL		
S1107	A0063	1936	80184	80197	LT	2.500	-02	UGL		
S1123	A0052	3782	80190	80197	LT	2.500	-02	UGL		
S1137	A0073	5456	80190	80197	LT	2,500	-02	UGL		
S1413	W0051	10	80185	80197	LT	2.500	-02	UGL		

•

PARAMETER: AG

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			FES	ULTS		
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	BOOL	MNTSA	EXF	UNIT	ACRY	FREC
	216355		*******		=====		<b>z</b> z-=z		******	
\$1102	A0066	1674	80183	80225	LT	3.000	+00	UGL		
S1104	A0068	2543	80183	80225	LT	3.000	+00	UGL		
S1107	A0063	1936	80124	80225	LT	3.000	+00	UGL		
S1108 -	A0064	886	80184	80225	LT	3.000	+00	UGL		
S1121	A0056	1500	80189	80225	LT	3.000	<b>+</b> 00	UGL		
\$1123	A0052	3782	80190	80225	LT	3.000	+00	UGL		
S1128	A0057	1958	80189	80225	LT	3.000	+00	UGL		
\$1133	A0061	2878	80185	80225	LT	3.000	+00	UGL		
				-						

PARAMETER: AL

.

4

SITE IDENTIFICATION	SAMPLE NUMBER	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS D'ATE	FOOL	MNTSA	EKE	ULTS UNIT	ACRY	
\$1102	A0001	1370	80051	80084		2.500	+93	UGL		
S1104	A0002	2283	80051	60064		4.000	+02	UGL		
51107	A0003	1453	80056	80086	LT	3.000	+02	UGL		
\$1108	A0004	575	80056	80084	LT	3.000	+02	UGL		
51109	A0005	2650	80057	80084	LT	3,000	+02	UGL		
31107	HOUUD	2000	00037	00004	<b>L</b> 1	31000	102	002		
S1111	800CA	2411	30058	80084	LT	3.000	+02	UGL		
S1112	A0005	1981	30057	80034	LT	3.000	+02	UGL		
S1115	A0007	2747	80057	80084	LT	3.000	+02	UGL		•
S1117	A0009	2799	80058	20084	LT	3.000	+02	UGL		
S111 <sup>(4)</sup>	A0010	3128	80058	80084		5.000	+02	UGL		
			00000	00000		7 0.00		UGL		
S1121	A0014	1206	80058	80084	LT	3.000	+02			
S1122	A0011	3914	80052	60084	LT	3.000	+02	UGL.		
S1123	A0013	2652	80053	80084	LT	3.000	+02	UGL		
\$1125	A0015	3609	80058	80084		1.200	+03	UGL		
S1127	A0012	1989	80052	80084	LT	3.000	+02	UGL		
21170		<b>D A</b> <i>i i</i>	00050	00004		1 000	+03	UGL		
\$1130	A0020	2461	80058	80084		1.000				
S1133	A0021	1944	80028	80084		3.000	+03	UGL		
S1134	A0022	4343	80058	80064		6.000	+02	UGL		
\$1202	M0001	0	80050	80088		9,750	+03	UGG		
\$1293	m0002	ō	80051	80038		1.080	+ 24	UGG		
S1204	noces	Ö	89050	80096		1,450	104	UGG		
\$1205	DS027	U	80050	80086		3.750	+03	UGG		
S1206	15029	o	80053	80086		1.750	463	UGG		
51207	M0004	õ	80053	80086		1.900	+04	UGG		
S1301	15036C	ŏ	80047	80086		9.500	103	UGG		
51301	1.00380	0	80047	00000		1.300	100	000		
\$1301	₩0015	60	80058	80064		3.000	+02	UGL		
91302	0.0390	0	80649	80086		9.750	+03	966 G		
e1303	1950420	ò	80050	30086		1.750	+04	UGG		
51304	150450	ŏ	80050	80086		2.300	+04	066		
51305	050480	ŏ	80050	80036		1.000	+04	UGG		
01000	000400	Ū	00000	00000		11000		000		
51300	D5051C	0	80050	80086		2,550	104	UGG		-
\$1307	D5054C	Ö	80050	80086		6.380	+03	000		
51307	W0017	60	80058	80084	LT	3.000	+02	UGL		
51308	105057C	ů Č	80051	86086		4.250	+03	UGG		
						1.400	104	000		. '
51309	0690540	0	80051	80086		1+400	1.04	:000		
S1710	B5063C	0	80051	80084		1.550	+04	UGG		
S1311	150660	ů.	\$0051	80086		1.000	+ù4	UGG		
\$1312	156690	0	80051	60085		1.080	: 04	UGG		
S131.2	00018	60	80058	80084	LT	3.000	4.9	UGL		
51314	mu(12	0 0	79319	80086		2.120	1.93	000		
21314	0.2017	v	17317	00000		20120	4.92.	000		
S1402	1/50/2	0	77324	80003		9.000	()3	066		
\$1404	05633	•2	80042	30004		5,750	- 3	UGG		
\$1404	6-20	a:,	36942	80084		1.500	+ 3	UGL		
51468	15000	0	79324	80066		3.500	+-)3	UGG		
		õ				6.500	103	000		
S140%	10009	v	79325	80086		8+309	103	000		
\$1410	05010	0	79325	80086		1.000	+04	UGG		
61411	15011	ō	79325	30086		7.000	+03	UG <b>6</b>		
		-								

 Ibbei
 0
 73330
 0.0046

 10001
 0
 00086
 0.0036

 10001
 0
 00086
 0.0036

 10001
 0
 00086
 0.0036

 10001
 0
 0.0036
 0.0036

 10001
 0
 0.0046
 0.0046

 10001
 0
 0.0046
 0.0046

 10001
 0
 0.0046
 0.0046

 10001
 0
 0.0046
 0.0046

 10001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001
 0
 0.0046
 0.0046

 1001

•

....

-----

0000 414 444 444 444 444 444

PARAMETER: ALDRN

.

٢

.

SITF	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS			
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MNTSA	E A P	UNIT	ACRY	PREC	
************	2.4710212		********			*******	<b>=</b> ===================================			******	
31102	A0066	1674	90133	80197	LT	3.300	-02	UGL			
S1104	A0068	2543	80183	80197	LT	3.300	-01	UGL			
S1107	A0043	1936	80184	80197	LT	3,300	-02	UGL			
\$1123	A0052	3782	30190	80197	LT	3.300	-02	UGL			
S1137	A00.73	5455	80190	80197	LT	3.300	-02	UGL			
51413	W0051	10	80185	80197	LT	3.300	-02	UGL			

PARAMETER: ALK

.

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALISIS		FEE	ULTS		
IDENTIFICS ION	NUMBER	DEPTH	DATE	DATE	FOOL MNTSA	EXF	UNIT	ACRY	FREC
sartrer: aut	********	======		****		***		******	******
S1117-UD//R	A0050	3321	S0193	80198	2,390	<b>+</b> ••••	MGL		
S1121-WPAR	6000A	1500	80189	80196	2,200	+62	MGL		
S1123~WENE	A0052	3782	80170	80196	2.320	+0.	MGL	•	
51128-WL#×	A0057	1958	80189	80196	1.250	+02	MGL		
S1134-wUMR	A0070	4176	80194	80198	3,270	+02	MGL		
S1135-WINR	A0001	4633	80194	80198	4.450	+02	MGL		
S1136-WERR	A0072	4572	80194	80198	3,350	+ů_	MGL		

PARAME LER: AS

.

BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMFLE	SAMPLE	SAMFLING'	ANALYSIS			REE	ULTS			
IPENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROGL	MNISA	EXF	UNIT	ACRY	PREC	
	******	=====			×≃≃≡	******			*****	**=***	
\$1102	A0066	1674	80183	80225	Lī	6.000	+00	UGL			
S1104	40038	2543	80183	80225	LT	6.000	+00	UGL			
\$1107	A0063	1936	80184	80225	LT	6.000	+00	UGL			
\$1108	A0064	886	80184	80225	LT	0.000	+00	UGL			
\$1121	A0056	1500	80199	80225	LT	0.000	+00	UGL			
S1123	A0052	3782	80190	60225	LT	6.000	+00	UGL			
S1128	A0057	1958	80139	80225	LT	6.000	+00	UGL			
\$1133	A0061	2878	80185	80225	LT	6.000	+00	UGL			

PARAME 11 R ... BBHC

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			<b>RES</b>	OLTS		
IDEN:1FICATION	NUMEER	DEPTH	DATE	DATE	BUUL	MNISA	EXF	UNIT	ACRY	FREC
n on Theorem Land		*****		********	*****		****	*****		
01102	AUOSS	1674	80183	80197	LŤ	3.500	-02	UGL		
01104	80058	2543	50183	80197	LT	3.500	-02	UGL		
S110 <sup>°°</sup>	A0063	1936	80184	80197	LĨ	3.500	-0.:	UGL		
S1123	A0050 1	3782	80190	80197	LT	3.500	-02	UGL		
91137	A0073	5456	80190	80197	Lï	3.500	-ú2	UGL		
31413	W0051	10	80185	80197	LĨ	3.500	-02	96L		•

PARAMONER: BE

.

SITE	SAMPLE	SAMPLE	SAMFLING	ANALYSIS			RES	ULTS		
1DENTIFICATION	NUMBER	I E F T H	DATE	DATE	ROOL	MNTSA	ExF	UNIT	ACRY	FREC
************	<b>425</b> 081			********		*****	<b>B</b> 2 2 3 3		3222**	*****
S1102	A0066	1574	80183	80225	LT	4.700	+01	UGL		
S1104	A0068	2543	80183	80225	LT	4.700	+01	UGL		
S1197	A0063	1935	80184	80225	LT	4.700	+01	UGL		
S11/8	A0064	836	80184	80225	LT	4.700	+01	JGL		
S1121	A0055	1500	60189	86325	LÌ	4.700	+01	UGL		
S1123	A0052	3782	80190	80225	LT	4.700	+01	UGL		
\$1128	A0057	1958	80189	80225	LT	4.700	+01	UGL		
S1133	A0031	2878	80185	80225	LT	4.700	+01	UGL		

~



•

.

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

PARAMETER: BENSLE

,

4

.

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS			
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	E × F'	UNIT	ACRY	FREC	
	======	122422	=================	28220222			*****		*****		
\$1102	A0066	1674	80183	20197	LT	6.400	-02	UGL			
51104	8300A	2543	60133	80197	LT	6.400	-02	UGL			
51107	A0043	1936	80184	30197	LŤ	6.400	-02	UGL			
S1123	A0052	3782	S0190	80197	LT	6.400	-02	UGL			
81137	A0073	5456	80190	80197	LT	6.400	~02	UGL			
S1413	W0051	10	80185	80197	LT	6.400	-02	UGL			

•

-

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

PARAMETER: COL4

SITE	CAMPLE	SAMPLE	SAMFLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	EQUE	MUTSA	EXF	UNIT	ACRY	PREC
1.25\$ <b>255</b> 55225.2\$	*****	******	*******	======================================	<b>3</b> .523		****			*****
61102	A0066	1674	80183	80197	ωï	3.000	-01	UGL		
51104	S600A	2543	80183	80197	LT	3.000	-0e	7GL		
£1107	A0063	1936	80184	80197	LT	3.000	-01	UGL	•	
\$1108	A0044	886	80184	80197	LT	3.000	-01	UGL		
S1109	A0059	2961	80185	80197	LT	3.000	-01	UGL		
S1117	A0050	3321	80193	80197		1.200	+01	UGL		
51121	A0055	1500	80189	80197	LT	3.000	-01	UGL		
31123	A0052	3782	80190	80197	LF	3.000	-01	UGL		
S1130	A0053	3485	80190	80197	LT	3.000	-01	UGL		
S1133	A0051	2878	80185	80197		7.000	-01	UGL		

PARAMETER: CD

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MHISA	EXE	UNIT	ACRY	PREC		
		******			*****		****	1 = 2 <b>2 2 2</b>		*****		
31102	A0066	1674	80183	80225	LT	1.000	+00	UGL				
S1104	830CA	2543	80183	80225	LT	1.000	+00	UGL				
S1107	A0063	1935	80184	80225	LT	1.000	+00	UGL				
S1108	A0064	986	80184	80225	LT	1.000	+0C	JGL				
S1121	A0056	1500	80189	80225	LT	1.000	+00	ՆՇԵ				
S1123	A0052	3782	80190	80225	LT	1.000	+00	UGL				
S1128	A0057	1958	80189	80225	LT	1.000	+00	UGL				
S1133	A0061	2878	80185	80225	LT	1.000	+00	UGL				

. •

# BADGER AAF - CHEMICAL ANALYSIS RESULTS BY FEST NAME

PARAMETER: CEC

.

•

.

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	IS RESULTS				
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL MNTSA	ΕλΡ	UNIT	ACRY	FREC
xestabate:	******	**==**	=======	*=======	**********				******
S1301	PS035	122	80049	80220	1.300	+01	MEQG		
S1302	15038	122	80049	80220	4.000	+00	MEQG		
\$1302	M0006	0	80049	80220	2.500	+01	MEQG		
S1303	D5141	274	80049	80220	1.000	+01	MEQG		
\$1303	M0789C	0	80049	80220	2.300	+01	MEQG		
S1304	D5044	183	80050	80220	1.200	+01	MEQG		
-		183		80220	2.800	+01	MEQG		
51304	M0010	-	80050	• • • • • •			MERG		
\$1305	115047	122	80050	80220	6.000 2.990	+00 +01	MERG		
S1305	M0012	0	80050	80220					
S1306	D5050	183	80050	80220	1.600	+01	MEQG		
\$1306	m1013	0	80050	80220	1.500	+01	MEQG		
S1307	05053	183	80050	80220	2.000	+01	MEQG		
51308	D5055	0	30050	80220	9.000	+00	MEQG		
\$1309	<b>D</b> 515a	61	80051	80220	1.500	+01	MEQG		
\$1309	D5058	0	80051	80220	2.900	+ŭ1	MEQG		
S1309	105059	61	80051	80220	1.900	+01	MEUG		
S1310	D2061	0	80051	80220	3.000	+01	MEQG		
S1310	D5065	61	80051	80220	2,700	+01	MEQG		
£1311	D5064	0	80051	80220	1.600	+01	MEQG		
\$1311	D5035	61	80051	80220	1.100	+01	MEQG		
S1312	05027	0	80051	80220	1.500	+61	MEQG		
\$1312	D2008	61	80051	80220	1.400	+01	MEQG		

·



PARAMETER: CHCL3

.

.

.

•

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL	MNTSA	EXF	UNIT	ACRY	PREC
*=============		=====		E21852EE		*******		******		
S1102	A0066	1674	80183	80197	LT	2.300	+00	UGL		
S1104	A0068	2543	80183	80197	LT	2.300	+00	UGL		
S1107	A0063	1936	80184	80197	LT	2.300	+00	UGL		
S1103	A0064	886	80184	80197	LŤ	2.300	+00	UGL		
S1109	A0059	2961	80185	80197	LT	2.300	+00	UGL		
51117	A0050	3321	80193	80197		6.600	+01	UGL	•	
S1121	A0056	1500	80189	80197	LT	2.300	+00	UGL		
S1123	A0052	3782	80190	80197	LT	2.300	+00	UGL		
S1130	A0053	3485	80190	80197	LT	2.300	+00	UGL		
S1133	A0061	2878	80185	80197	LT	2.300	+00	UGL		

PARAMETER: CLDAN

1

.

.

i.

1

ſ

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BÜÜL	MNTSA	EXF	UNIT	ACRY	PREC		
*************				=======	======================================							
51102	A0066	1674	80183	80197	LT	1.100	-01	UGL				
S1104	8300A	2543	80183	80197	LT	1.100	-01	UGL				
S1107	A0063	1936	80184	80197	LT	1.100	-01	UGL				
\$1123	A0052	3782	80190	80197	LT	1.100	-01	UGL				
S1137	A0073	5456	80190	80197	LT	1.100	-ú1	UGL				
S1413	W0051	10	80185	80197	LT	1.100	-01	UGL				

•

#### PARAMETER: COD

.

;

SITE	SAMFLE	SAMPLE	SAMPLING	ANALYSIS				ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL		EXF	UNIT	ACRY	PREC
LESSREEL LUGSE			*******	*******			<b>R. .</b>	======	******	******
S1117-WINK	A0050	3321	80193	80197		5.000	+00	HGL		
S1121-WDNR	A0056	1500	80189	80197		4.700	+01	MGL	•	
S1123-WDNR	A0052	3782	80190	80197	LT	5.000	+00	MGL		
S1128-WUNR	A0057	1958	80189	80197	ĒŤ	5.000	+00	MGL		
S1134-WBRHF.	A0070	4176	80194	80197		1.200	+01	MGL		
S1135-WD#R	A0071	4633	80194	80197		6.000	+00	HGL		
S1136-WDWR	A0072	4572	80194	80197		9.000	+00	MGL		
S1361	05035	122	80049	80262		4.370	+64	UGG		
S1301	M0005C	0	80049	80260		1.040	+05	UGG		
S1302	D2038	122	80049	80254		1.420	+04	UGG		
\$1302	H0006	0	80049	80230		2.650	+05	UGG		
						7.290				
S1303	DS041	305	80050	80253		2.500	+04	UGG		
S1303	M00070	0	80050	80262			+05	UGG		
S1304	05044	183	80050	80253		2.700	+04	UGG		
S1304	M0010C	0	80050	80200		4.830	+05	UGG		
S1305	115047	122	80050	80260		6.900	+03	UGG		
S1305	050480	0	80050	80262		1.250	+05	UGG		
\$1305	M0012	0	80050	80260		5.110	+05	UGG		
S1306	D5050	183	80050	80254		5.260	+04	UGG		
51306	M0013C	o	80050	80260		6.350	+05	UGG		
51307	05003	183	80050	80262		4.950	+04	JGG		
\$1307	M0015	0	80050	80254		5.940	+05	UGG		
S1307	D5055	ŏ	80051	80260		2,070	+04	UGG		
S1308	D5056	122	80051	80262		1.240	+03	UGG		
51309	D5059	61	80051	80253		5.410	+04	UGG		
51507	13034	61	80031	80203		5.410	404	000		
\$1310	D5061	0	80051	80254		8.310	+04	UG6		
51310	<b>n5</b> 632	61	80051	180254		6.440	+1)4	UG <b>G</b>		
81311	<b>PS064</b>	0	80051	80254		6.350	+04	066		
\$1311	05085	61	80051	80254		1.190	+04	UGG		
S1312	DS067	0	80051	80254		5.950	+04	UGG		
61710	T.C		00051	0005.4						
S1312	105638	61	80051	80254		2.590	+04	UGG		
51313	m0018	0	79319	80260		2.040	+05	UGG		
\$1714	M0012	0	79319	80260		1.470	404	000		

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

4

,

4

.

.

•

ER i	COND	

SITE	SAMPLE	ANALYSIS	IS RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL M	INTSA	EXF	UNIT	ACRY	PREC
***********	*****	*****	*******	********	*******	*****	******			
S1117-WDNR	A0050	3321	80193	80197	5	.500	+02	UMHC		
S1121-WDNR	A0056	1500	80189	80197	3	.880	402	UMHC		
S1123-WUNR	A0052	3782	80190	80197	3	.470	+02	UMHC		
S1128-W1NR	A0057	1958	80189	80197	1	.770	+02	UMHC		
S1134-WDNR	A0070	4176	80194	80197	1	.190	+03	UMHC		
51135-WDNR	A0071	4633	80194	80197	6	.300	+02	UMHC		
S1136-WINR	A0072	4572	80194	80197	4	.800	+0_	UNHC		

,

# PARAMETER: CR

.

ά.

.

,

.

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMPLING	RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	E X F	UNIT	ACRY	PREC	
		******			***************************************						
S1102	A0066	1674	80183	80225	LT	4.000	+00	UGL			
51104	A0038	2543	80183	80225	LT	4.000	+00	UGL			
S1107	A0063 '	1936	80184	80225	LT	4.000	+00	UGL			
51108	A0064	886	80184	80225	LT	4.000	+00	UGL			
S1121	A0056	1500	80189	80225		5.000	+00	UGL			
S1123	A0052	3782	80190	80225		1.100	+01	UGL			
S1128	A0057	1958	80169	80225	LT	4.000	<b>+0</b> 0	UGL			
S1133	A0061	2878	80185	80225		7.000	+00	UGL			

•

PARAMETER: CUTOT

SITE	SAMPLE	PLE SAMPLE SAMPLING ANAL			YSIS RESULTS						
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	EXF	UNIT	ACRY	PREC	
*************		******	********	********	220022_225555222343_2255 <b>55555555555</b> 5555555555555555555555						
\$1102	A0056	1674	80183	80225		3.400	+01	UGL			
\$1104	8300A	2543	80163	80225		1.000	+01	UGL			
\$1107	A0063	1936	80184	80225		1.000	+01	UGL			
\$1108	A0064	886	80184	80225		7.000	+00	UGL			
\$1121	A0056	1500	80189	80225	LT	5.000	+00	UGL			
\$1123	AQ052	3782	80190	80225		1.000	+01	UGL			
S1128	A0057	1958	30189	80225	LT	5.000	+00	UGL			
S1133	A0061	2878	80185	80225		1.100	+01	UGL			



•

•

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

PARAMETER: DBHC

١

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	RESULTS						
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL	MNTSA	EXF	UNIT	ACRY	PREC	
***********	******				****	TZEEZUE	*****	=t== <b>=</b>			
S1102	A0055	1674	80183	80197	LT	2.600	-02	UGL			
S1104	A0058	2543	80183	80197		6.000	-02	UGL			
S1107	A0063	1936	80184	80197	LT	2.600	-02	UGL	:		
\$1123	A0052	3782	80190	80197	LT	2.600	-02	UGL			
S1137	A0073	5456	80190	80197	LT	2.600	-02	UGL			
S1413	W0051	10	80185	80197		1.400	-01	UGL			

.

PARAMETER: DBP

ί.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			FES	ULTS		
IDENTIFICATION	NUMPER	DEPTH	<b>I</b> ATE	DATE	FOOL	MNTSA	EXF	UNIT	ACRY	PREC
JEXJESCOPOX <b>CON</b>	******	<b>==</b> ===		*******	=====	******	*****	*****		323228
<b>0</b> 4 0 0 4										
S1201	D5019L	457	80046	80222	LT	3.000	+00	UGG		
S1201	D5019U	457	80046	80222	LT	3.000	+00	UGG		
S1202	D5020S	91	80050	802 <b>63</b>	LT	3.000	+00	UGG		
S1202	B5020U	91	80050	80222	LT	3.000	+00	UGG		
\$1202	05021	457	80050	80222	LT	3.000	+ú0	UGG		
S1203	P5022	91	80051	80222	LT	3.000	+00	UGG		
S1203	05023	488	80051	80222	ET.	3.000	+00	UGG		
51203	M0002	0	80051	80222	LT	3.000	+00	UGG		
51204	D5024C	152	80050	80222	LT	3.000	+00	UGG		
S1204 S1204	D5024	579	80050	80222	LT	3.000	+00	UGG		
51204	00026	3/7	80030	8V222	L 1	3.000	400	000		
\$1205	D5027	0	80050	80222	LT	3.000	+00	UGG		
S1205	D5028	457	80050	80222	LT	3.000	+00	UGG		
S1205	M0050	18	80193	80222	LT	3.000	+00	UGG		
S1205	M0050	18	80193	80222	LT	3.000	+00	UGG		
S1206	05029	ō	80053	80222	LT	3.000	+00	UGG		
01200	2.002.7	v	00000	00424		3.000		000		
S1206	DS030	457	80053	80222	LT	3.000	+00	UGG		
S1206	M0051	18	80193	80222	LT	3.000	+00	UGG		
S1207	05031	61	80053	80222	LT	3.000	+00	UGG		
51207	05032	457	80053	80222	LT	3.000	+00	UGG		

. . . .

PARAMETER: DEP

,

ŧ

.

.

IDENTIFICATION NUMBER DEPTH DATE DATE BOOL MNTSA EXP UNIT ACRY	PREC
ntereservers inclis perio series superior freedoresseries	******
S1201 D5017L 457 80046 30222 LT 4.000 +00 UGG	
S1201 D5019U 457 80046 80222 LT 4.000 +00 UGG	
S1202 D5020S 71 80050 80263 1.340 +03 UGG	
S1202 D5020U 91 80050 80222 LT 4.000 +00 UGG	
S1202 D5021 457 80050 80222 LT 4.000 +60 UGG	
51203 D5022 91 80051 80222 1.060 +02 UGG	
S1203 D5023 488 80051 80222 1.100 +01 UGG	
51203 M0002 0 80051 80222 4.400 +02 UGG	
S1204 D5024C 152 80050 80222 5,000 00 UGG	
S1204 D5026 579 80050 80222 LT 4.000 +00 UGG	
S1205 D5027 0 80050 80222 LT 4.000 +00 U56	
S1205 D5028 457 80050 80222 LT 4,000 400 UGG	
\$1205 M0050 18 80193 80222 1.350 +02 UGG	
S1205 M0050 18 80193 80222 6.800 +01 UG6	
S1205 D5029 0 80053 80222 LT 4,000 ±60 UGG	
S1206 D5030 457 80053 80222 LT 4.000 + 0 UGG	
S1206 M0051 18 80193 80222 4.400 ±01 UGG	
S1207 D5031 61 80053 80222 LT 4.000 +00 UGG	
S1207 D5032 457 80053 80222 LT 4.000 +00 UGG	

.

·. •

#### PARAMETER: DLDRN

,

.

.

4

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

•

SITE	SAMFLE	SAMPLE	SAMPLING	ANALYSIS	RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	POOL	MNTSA	EXF	UNIT	ACRY	FREC		
==*=6485======	******	******										
S1102	A0066	1674	80183	80197	LT	1.600	-01	UGL				
S1104	A0068	2543	80183	80197	LT	1.600	-01	UGL				
S1107	A0063	1936	80184	80197	LT	1,600	-01	UGL				
\$1123	A0052	3782	80190	80197	LT	1.600	-01	UGL				
S1413	W0051	10	80185	80197	LT	1.600	-01	UGL				

.

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

PARAMETER: ENDRN

٩

:

SITE	SAMFLE	SAMPLE	SAMPLING	RESULTS								
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	EOOL	MNTSA	E X F	UNIT	ACRY	PREC		
************	w stanit sestes soustes thebetar					#0123222238888222233228 <b>232282</b> 8 <b>3</b> 8 <b>2</b> 8 <b>3</b> 8						
51102	A0066	1674	80183	80197	LT	3.000	-02	UGL				
S1104	A0068	2543	80183	80197	LT	3.000	-02	UGL				
S1107	A0063 .	1936	80184	80197	LT	3.000	- 02	UGL				
S1123	A0052	3782	80190	80197	LT	3.000	-02	UGL				
S1137	A0073	5456	80190	60197	LT	3.000	-02	UGL				
S1413	W0051	10	80185	80197		6.600	-02	UGL				

. •

#### PARAMETER: FE

.

.

.

.

.

I.

+

1

.

.

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SANFLE		SAMPLE	SAMPLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	POOL	MNTSA	EXE	UNIT	ACRY	FREC	
5#22222222222		******	*******	zerazzeń					*****	222453	
S1117-WDNR	A0050	3321	80193	80197		9.600		MGL			
S1121-WUNR	A0056	1500	80189	80197		4.800	-01	MGL			
S1123-WDNR	A0052	3782	30190	60197		1.540	+00	MGL			
S1128-WUNR	A0057	1958	80187	80197	LT	4.000	-02	MGL			
S1134-WINR	A0070	4176	80194	80197		9.500	-01	MGL			
S1135-WDNR	A0071	4633	80194	80197		5.710	+00	MGL			
S1136-WINR	A0072	4572	80194	80197		2.360	+00	MGL			

PARAMETER: HARD

.

۱.

.

SITE	SITE SAMPLE SAMPLI		SAMPLING	ANALYSIS	RESULTS					
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL MNTSA	EXP	UNIT	ACRY	PREC	
		******			**********				******	
S1117-WENR	A0050	3321	80193	80197	4.350	+02	MGL			
S1121-WDNR	A0056	1500	80189	80197	2.570	+02	MGL			
S1123-WDNF:	A0052	3782	80170	80197	3.410	+02	MGL			
S1128-WDPR	A0057	1958	80189	80197	1.430	+02	MGL			
S1134-WINR	A0070	4176	30194	80197	1.030	+03	MGL			
S1135-WINR	A0071	4633	80194	80197	6.780	+02	MGL			
S1136-WENR	A0072	4572	80194	80197	3.390	402	MGL			

•

•

.

......

PARAMETER: HGTOT

i

٠

4

٤.

£

RESULTS						
UNIT ACRY PREC						
UGL						
UGL .						
UGL						
UGL						
UGL						
UGL						
UGL						
UGL						

# PAPAMETER: HN3N2

# BADGER AAP - CHEMICAL ANALYSIS RESULTS DI TEST NAME

.

1.5

١

.

ŧ

.

SITE	SAMFLE	SAMFLE	SAMPLING	ANALYSIS	RESULTS					
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	E≍F	UNIT	ACRY	FREC
	******	222222		==== <b>=</b> ==			***		*****	328120
S1301	D5035	122	80047	80252		4.750	+01	UG <b>G</b>		
51301-WINR	D2034C	0	80049	20059		6.500	+01	UGG		
S1302	D2038	122	80049	80252		6.400	+01	UGG		
S1302	M0003	0	80049	80252		1.200	+92	UGG		
S1303	D5041	305	80050	80252		3.480	+02	UGG		
S1303	M0007C	0	80050	80252		1.930	+03	UGG		
S1304	05044	183	80050	80252		2.240	+02	UGG		
S1304	MOOIOC	0	80050	80252		5.150	+02	UGG		
\$1305	05047	122	80050	60252		1.020	462	UGG		
S1305	H0012	ō	80050	80252		2.860	+03	UGG		
01000	noord	Ŭ	00000	00202		2,000	1.20	000		
51306	05050	183	80050	80252		6.080	462	UGG		
51306	M0013C	0	80000	80252		3,270	103	UG <b>G</b>		
S1307	15053	183	80050	80252		1.020	+03	UG <b>G</b>		
S1307-WINR	DS054C	0	8005 <b>0</b>	80059		1.450	+03	UGG		
\$1308	D2022	0	80051	80252		8.400	+01	UGG		
S1308	05056	122	80051	80252	LT	1.300	+01	UGG		
\$1309	05058		80051	80252		3,180	+02	000		
S1309	05059	61	80051	80252		2,780	+02	UGG		
S1310	05061	0	80051	80252		1.020	+03	UGG		
51310	D5052	61	60051	80252		5.860	+02	UGG		
51510	10001	01	00001	60202		0.000	<b>*</b> · •	0.30		
51311	DS004	0	80051	00252		1.700	+02	UCG		
S1311	05065	61	80051	80252		1.720	402	UGG		
\$1312	D5088	61	80051	80252		8.800	+91	UGG		
\$1312-WDNR	D5069C	0	80051	80059		2.970	402	UGG		
S1313	M0018	0	79319	80252		3.100	+0.2	UGG		

PARAMETER: HPCL

•

1

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS			
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	£00L	MNTSA	EXF	UNIT	ACRY	PREC	
						20200000000000000000000000000000000000					
S1102	A0066	1674	80133	80197	LT	1.200	-01	UGL			
S1104	A0068	2543	80183	80197	LT	1.200	-01	UGL			
51107	A0063	1936	80184	80197	LT	1.200	-01	UGL			
S1123	A0052	3782	80190	80197	LT	1.200	-01	UGL			
S1137	A0073	5456	80190	80197	LT	1.200	-01	UGL			
S1413	W0051	10	80185	80197	LT	1.200	-01	UGL			

PARAMETER: LIN

í

•

٠

SITÉ	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			EE S	ULTS			
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MUTSA	EXE	UNIT	ACRY	PREC	
***********	******	======	=======	ESTITES.			<b>z ż</b> 2 = 5	*****	**== = = =		
S1102	A0065	1674	60193	30197		6.700	-ci	UGL			
51104	80068	2543	80183	80197	LT	2.800	-02	UGL			
S1107	A0063	1936	80184	80197	LT	2.800	-02	UGL			
S1123	A0052	3782	80190	80197	LT	2.800	-02	UGL			
S1137	A0073	5456	80190	80197	ιr	2.800	-02	UGL			
S1413	W0051	10	80185	80197	LT	2.800	-02	UGL			

٠

۰.

÷

.

PARAMETER: NC

٠

SITE	SAMPLE	SAMPLE	SAMPLING						
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL MATSA	EXF	UNIT	ACRY	PREC
************	******	*****	*******	1222222				******	
		•							
S1201	D5018	0	80046	80084	6.000	+04	0666		
<b>D1204</b>	M0003	0	80050	80034	3,360	40î	166		
\$1206	D5029	0	80053	80084	1.200	-01	UGP		
51267	h0004	0	80053	80084	1.038	+03	UGG		
S1301	150386	0	80049	80091	3.800	463	UΰG		
S1301	W0016	60	80058	80091	1.290	+01	nGL	+0	3
\$1307	D5054C	0	80050	80091	1.200	+05	066		
S1307	W0017	60	80058	80091	2.010	+00	MGL	+.01	18
\$1312	D5039C	0	80051	80071	6.000	-02	UGG		
51312	W0019	60	80058	60091	2.260	+00	MGL	4.01	16
S1314	M0017	0	79319	80091	1.300	-01	066		
S1314	W0019	60	79319	80091	6.470	+00	MGL	+.H3	ó
51410	D5010	0	79325	80091	4.300	-01	UGG		
S1413	D5013	õ	79330	80091	3.400	+04	96 <b>6</b>		
S1415	05015	ō	79330	80091	1.100	-01	UGG		
51415	05015	0	79330	80091	1.100	-01	UGG		

PARAMETER: NG

SITE	SAMFLE	SAMFLE	SAMPLING	ANALYSIS			HES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MNTSA	EAF	UNIT	ACRY	FREC
	221212	******		********	29521		# 2 2 ° 4		*== **	******
S1122	A0011	3914	80052	80086	LT	1.100	+01	UGL		
S1124	A0051	3619	80192	80200	LT	1.100	+0:	UGL		
51404	D5033	0	80042	80086		4.450	400	UGG		
51404	M0054	10	80192	80200	LT	1.300	-01	UGG		
51404	W0020	45	80042	80086	LT	1.100	+¢1	UGL		
S1404	W0050	76	80192	80200	LT	1.100	+01	UGL		

PARAMETER: NI

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMFLING	ANALYSIS			876	ULTS		
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	ROOL	MNTSA	CXF:	UNIT	ACRY	PREC
2222222222222222	EG2277	*****	*=#====	*******			#2 E ·· 1	******		
S1102	A0066	1674	80183	80225		1.300	+01	UGL		
S1104	830 <b>0A</b>	2543	80183	80225	LT	3.000	+6.9	UGL		
S1107	A0053	1936	80184	80225	LT	5.000	+0:	UGL		
51108	A0064	886	80134	80225	LT	8.000	+90	UGL		
S1121	A0056	1500	80189	80025	LT	8.000	100	UGL		
S112 <b>3</b>	A0052	3782	80190	80225	LT	9.000	+00	UGL		
S1128	A0057	1958	80189	80225	LT	8.000	+00	UGL		
31133	A0061	2878	80185	80225	LT	8.000	+00	UGL		

•-----

PARAMETER: NO2

.

1

SITE	SAMPLE	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS Date	POOL	MNTSA		ULTS UNIT	ACRY	FREC	
	EE # = u u	******	*********		:::==	*******		<b></b>	******	*****	
							• .				
S1102	A0001	1370	80051	80056	LT	2,500	-01	ngl			
\$1102	A0060	1674	80183	80172	ίT	2.500	-01	MGL			
\$1103	A0057	3586	80182	80192	ĻΤ	2.500	-01	HGL			
31104	A0002	2283	80051	80056	LT	2.500	-01	MGL			
S1105	A0062	3265	80184	80192	LT.	2.500	-01	nuL			
\$1105	A0069	4062	80183	80192	L1	2.500	-01	MGL			
S1107	A0003	1453	80056	80060	L ]	2.500	-01	hGL			
S1107	A0063	1936	80134	80192	LΤ	2.5 0	01	MGL			
S1108	A0004	575	80056	80060	1. T	2.500	- 01	mGL			
S1103	A0064	886	80184	80192		3.600	-01	MGL	-0.2	34	
<b>C</b> 100	1000E	2650	80057	80060	ι Τ	2.500	-01	HGL			
S1109	A0005			80020	L.I	2.500	-01	MGL		,	
S1111	80008	2411	80008				-01	MGL			
S1111	A0008	2411	80058	80050	LT	2.500	-01	MGL.			
S1112	A0006	1981	80057	80060	LT	2.500	-01	MGL MGL			
S1113	A0055	1708	80189	80192	LT	2,500	-01	HUL			
S1115	A0007	2747	80057	80040	L ]	:	- 01	MGL			
\$1117	A0007	2799	80058	50060	LT	2,500	-01	MGL			
51119	A0010	3128	80053	80060	LT	2.500	-01	MGL			
\$1121	A0014	1206	80058	80060	L.T	2.500	- 61	MGL			
S1122	A0011	3914	80052	80050	LT	2.500	-01	MGL			
	HOVII	0,14	00002	0000		2	• -				
811.3	AC013	2652	00053	03008	LĪ	2.500	- 01	nGL			
S1125	A0015	3609	80058	80060	LT	2.500	-01	MGL	÷		
S1127	A0012	1089	80052	80080	L T	2.500	-0.1	MISE			
S1107	A0012	1787	80052	80060	LT	0.500	-C1	~GL			
51130	A9020	2461	90058	80036	LT	2.500	-01	MUL			
31133	A0071	1944	80058	80056	11	2.500	-01	MGL			
S1/33	A0051	2873	80125	80172	L. 1 L. 1	2.500	-01	MGL			
				801-12	LT	2.500	- 01	nGL			
01134 81134	A0022	4343 4343	80058 80058	800×8 80068	1 I	3.200	-01	MGL	02	38	
S1201	A0022 D5018	4343	80038	80081	t. 1	5.300	-01	нон. 1166	02	00	
31.01	00010	U	60048	80001	L. I	0.370	-01	0.575			
\$1204	m0003	0	80050	80081	LT	5.300	-01	666			
S1005	D5000	0	800%0	80081	ίT	5.300	01	066			
S1200	05629	0	80053	\$5081	1.1	n.300	-01	UGG			
S1207	H0004	Ó.	80053	80681		3.405	+ŵ)	าอก	F3+1	K1	٠
\$1301	150350	0	00049	80 - C1	εT	00	01	1951.			
S1301	W0016	60	30058	8005	L. 3		-ft.	t uu	:72	1,	
91302	N50390	0	80008	S00:11	<b>L</b> *	1.135	+00	. 00 0.00	-1.0	N2	
51303	1050423.	0	30050	00681		1.703	<b>1</b> •	ျင့်မ	1.5	1.E.	
51 SO 4	056451	2	80000	60031		1.352	10.1	. 15g	11.4	1/2	
S1305	µ∷-04:-0	0	80050	80081	ίT	5.300	)1	10 Pro			
51 (2)	L'Act (	ن ن	60.50	80ve t	L	5. 190	·• :	13:45			
11 (C)	Weel	60	39.25	COMP.	έ.,		• •2.	و بان			
S1 % du	#Sonin	0	83651	89.001		1.410	キワワ	54 G	+1.5	N 1	
S1.557	B5060.	0	8.051	899901		1.302	100	មចា	+1.2	×2	
\$1.319	P508-9	0	80051	80081		1.1	4.00	ւյուն	+1.0	12	
·:::::::::::::::::::::::::::::::::::::	Coz. 1	é	80014	20081	· ·		• •/1	4.5			
· 1 · 1 .	J54	õ	8.90%	1160.04	•	1.1.		1.5	11.0	K2	
· •	4.4.2 <sup>4</sup>	w.		1. S. S. S.			•	•		•••	

1312	W0010	6 V	80058	8.0366	L (	2.500	e v i	mG		
81314	M0017	0	79319	80081	LT	6.300	-0:	000		
S1402	<b>D500</b> 2	0	79324	80001		9.420	túý	UGG	<del>1</del> 8.6	C2
S1404	<b>W</b> 0020	45	80042	80056	LT	2.500	-01	MGL		
51404	W0020	45	80042	30066	LT	0.500	1	MGL		
S1404	Woodo	45	80042	80056	LT	500	-01	MGL		
51404	M0020	45	80042	80066	LT	2.500	- C :	MGL		
51408	DSCOS	0	79324	80081	L.T	6.300	-01	066		
\$1409	B5009	0	79325	80081	LT	6.300	1	UGG		
S1411	DS011	υ	79325	80031		1.510	+01	UGG	+14	C2
S1414	D5014	0	79330	80081		2.610	+0.	UGG	+2.4	C8
S1415	DS010	Ó	79330	80081		1.360	<u>ه</u> ر.	UGG	+1.2	K2

·

.

•

· .

•

•

PARAMETER: NO3

.

٠

.

.

SITE IDENTIFICATION	SANFLE NUMBLE	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS DATE	ROCL	MNTSA	EXE			PREC
				******						
S1102	A0001	1370	80051	80055		1.600	+::	HGL	-10	2
S1102	A0066	1674	80183	80192		8.150	i alijij	MGL	-5.2	29
51102	A0057	3586	80182	80192		3.320	+00	MGL	-2.1	30
51103	A0002	2283	80051	80056		3.400	400	MGL	-2.2	40
S1104 S1105	A0062	3265	80184	80192		2.480	+60	MGL	-1.5	48
51105	HUVGL	3265	60104	60172		- 140V	1.00	HOL	-1.0	-0
51106	A0069	4062	80193	80172		1.970	400	MGL	-1.3	60
S1107	A0003	1453	80055	80060		000	-01	MGL	38	20
\$1107	A0063	1936	80184	80192		4.300	- ÷1	MGL	-2.8	55
S1108	A0004	575	80055	60050	LT	3.600	-01	MGL		
S1108	A0064	836	80184	80192		4.000	01	MGL	-2.6	C3
51109	A0005	2650	80057	30050		6.000	+00	MGL	- 4	C2
51111	A0008	2411	80058	8:060		2.000	- 21	MGL	50	16
				30060		7.000	-01	MGL	50	16
S1111	A0008	2411	80058				1111	MGL	-0.7	12
\$1112	A0006	1981	80057	80040		1.000	+00			
S1113	A0055	1708	80189	80192		1.920	400	MGL	-1.2	62
S1115	A0007	2747	80057	80050		1.900	100	MGL	-1.2	60
S1115 S1117	A0009	2799	80058	80060		3.000	+00	MGL	-2	C4
	A0050	3321	80193	S0199		2.180	100	MGL	-1.4	55
S1117-WDHR S1119	A0010	3128	80058	50197 60060		1.500	+00	MGL	-0.9	80
						2,700	-01	nGL	17	44
51121	A0014	1206	80058	8008 <b>0</b>			-01	HOL	1/	
01121-WDHR	8000S6	1500	80189	80192		3.300	- 01	MOL	-2.1	72
\$1122	A0011	3914	80052	80060		2.500	01	mGL	16	05
S1123	A0013	2652	80053	80050		7.000	+00	MGL	-5	C2
S1123-WINR	A0050	3782	80190	30192		3.910	+00	MGL	-2.5	61
S1125 WANK	A0015	3609	80058	80060		1.100	400	MGL	-0.7	11
							۰.		~ •	- <b>-</b>
51127	A0012	1989	80052	00003		3.200		MGL	21	37
51127	A001.	1989	80052	80050		3.200	-01	MGL	21	37
51128-WDNR	A0057	1958	80189	80192		21900	-01	MGL	-1.7	41
S1130	A0020	2461	80058	80055	LT	3.600	- 🤤 🗄	MGL		
S1133	A0021	1944	80058	1900 <b>6</b> 6		4.000	400	MGL	-3	15
01133	A0061	2878	80185	30192		2.940	+00	mGL	-1.9	41
\$1134	A0022	4343	80058	80066		1.300	+ ) -	rGL	-0.8	45
S1134-WDNR	A0070	4176	80194	801777		2.470	+00	MGL	-1.6	40
01135- WDNR	A0071	4633	80194	80199		8.900	- 1	MGL	-5.7	C1 .
01135-WIMR	A0072	4572	80194	80199		5.250	477	MGL	-3.4	.2
\$1201	D5018	o	8004a	20081	LT	2.400	-01	066		
								000 UGG		
51204	M0003	0	80050	80081	LT	8.890	-			
S1205	D5627	0	80050	80081	LT	8.400	• ;	006		
S120&	DIACES	0	80053	00081	LT	8.400	-21	066		
S1107	M0004	O	80053	£0081	LT	3.890	-01	UGG		
\$1301	050350	Q.	80049	80081	ιT	8.40)	· · · :	តមប		
L1 55 1	W0017	60	20056	1 1990 A	11	5.600	17.1	MOL		
1.50	659 th.	C	C0041	80081	LT	0.400	-1 }	066		
51303	1564.0	õ	89950	801 21	L.T	3.400		UGG		
\$1.504	£564%C	õ	80050	8000-1	ĒT	2.400	-04	066		
5. 1 1 Sty	<b>B</b> SOATE	Ŭ	00050	20081	ιI	0.400	;	066		
	Repair for	c	80050	Geedal	11	3,490		1156		
1.1.7.28	11 Jan 19	C C	609000	1287 T 189 K	. 1	200 O.V.	1	0		

S1307	W0017	60	8005 <b>8</b>	80066		4.400	-01	moL	28	27
S1308	DS057C	0	80051	80081	LT	8.400	-01	∵G <b>G</b>		
S1309	15090C	0	80051	80081	LT	8,400	-01	0 <b>66</b>		
S1310	D2043C	0	80051	80081	LT	8.400	-01	900		
S1311	D2026C	0	80051	80081	LT	8.400	-01	UGG		
S1312	050690	0	80051	80081	LT	8,400	-01	UGG		
\$1312	W0013	60	80058	600066		4.400	-01	MGL	29	27
\$1314	M0012	0	79319	80081	LT	B.890	-01	UGG		
S1402	05002	0	79324	80081	LT	8.400	-91	UGG		•
S1404	W0020	45	80042	80056	LT	3.600	-01	MGL		
S1404	W0020	45	80042	80066	LT	3.000	-01	MGL		
\$1404	W0020	45	80042	80066		4.400	-01	MGL	29	27
S1404	W0020	45	80042	80066		4.400	-01	MGL	29	27
S1408	<b>D2008</b>	0	79324	80081		2.500	+00	UGG	+.42	14
\$1409	D5009	0	79325	80081	LT	8.400	-01	1/66		
S1411	05011	ō	79325	80081	-	1.420	+00	00 <b>0</b>	+.09	22
51414	05014	ŏ	79330	80031	LT	8.400	-01	UGG		
\$1415	05015	õ	79330	80081	-	9.630	-01	UGG	+.06	33

•

.

1

.

•

4

1

.

ŧ

ŧ

BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMFLE	SAMFLING	ANALYSIS			FE 3	ULTS		
IDENTIFICATION	NUHBER	DEPTH	DATE	DATE	ROOL	MNTSA	EXF	UNIT	ACRY	FREC
	******	*=****	*******	*********		=====	<b>z</b> za:			
S1117-WENR	A0050	3321	80193	80196	LT	1.000	400	nGL		
S1121-WINE	A0056	1500	80189	80196	LT	1.000	+00	MGL		
S1123-WINR	A0052	3782	80190	80196	LT	1.000	+00	MGL		
S1128-WDWR	A0057	1958	80189	80196	LT	1.000	<b>+</b> 00	MGL		
S1134-WINR	A0070	4176	80194	80196		1.100	<b>+</b> 00	MGL		
S1135-WUNR	A0071	4633	80194	80196	LT	1,000	+00	nGL		
S1136-WUNR	A0072	4572	80194	80196		1.100	+00	MGL.		

÷

PARAMETER: PB

.

.

.

.

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RE E	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MNTSA			ACRY	PREC
	**=***		EXENSERS.		22233				******	332232
		-							• •	•
S1102	A0001	1370	80051	80084		9.600	+00	UGL	-0.4	8
S1102	A0066	1674	80183	80225	ĻΤ	1.700	+QC	UGL		
S1104	- 2000A	2283	80051	80084	LT	1.700	+00	UGL		
51107	A0003	1453	80056	80088		7.700	+01	UGL	-0.3	10
S1107	A0063	1936	80184	80225	LT	1.700	+00	UGL		
01100		676	0005/	30088	LT	1,700	+00	UGL		
S1108	A0004	575	80056							
\$1108	A0064	886	80184	80225	LT	1.700	+00	UGL		
S1107	A0005	2650	80057	80084	LT	1.700	+00	UGL		
S1111	8000A	2411	80058	80084	LT	1.700	+00	UGL		
S1112	A0006	1981	80057	80088	LT	1.700	+00	NOL		
S1115	A0007	2747	80057	80088	LT	1.700	+00	UGL		
		2799	80058	60084	<b>.</b>	7.700	+00	UGL	-0.3	10
S1117	A0009			80084		2,900	+00	UGL	-0.1	27
S1119	A0010	3128	80058							20
S1121	A0014	1206	80058	80084		3.800	+00	UGL	-0.2	
S1121	A0056	1500	80189	80225		5.600	<b>+</b> 00	UGL	-0.2	14
S1122	A0011	3914	80052	80088		2.900	100	UGL	-0.1	27
S1123	A0013	2652	80053	80088	LT	1.700	+00	UGL		
S1123	A0052	3782	80190	80225		1.400	+01	UGL	-1	5
S1125 S1125	A0015	3609	80058	80084		1.400	+01	UGL	-1	ŝ
		1989	80052	80084		5.300	+00	UGL	-0.2	14
S1127	A0012	1787	60032	60.04		0.000	100		V12	• •
S1128	A0057	1958	80189	80225	LT	1./00	+00	UGL		
S1130	A0020	2461	80058	80084		2,900	+00	UGL	-0.1	27
\$1133	A0021	1944	80058	80084	LT	1.700	+00	UGL		
S1133	A0061	2878	80185	80225		1.100	+01	UGL	-1	7
S1134	A0022	4343	80058	80084		1.800	+01	UGL	-1	4
\$1292	M0001	0	80050	80003		1.000	+0.3	+IGG		
31203	M0002	0	80051	30080		4,500	+01	90 <b>6</b>		
S1204	M0003	0	80020	80088		1.800	+02	េចច		
S1205	05027	0	80050	60086		3.000	+61	UGG		
S1206	115029	0	80053	80086		2.000	+01	UGG		
~ ~ ~ ~ ~		•	00057	80086		1.050	+62	UGG		
S1207	M0004	0	80053			9.500		UGG		
S1301	050360	0	80049	80086			+01			
S1301	W0016	60	80058	60084		4.800	+01	UGL	-0.2	16
\$1302	D5039C	0	80049	80084		÷.000	+01	UGG		•
51303	150420	0	80050	30083		1.700	+02	UGG		
S1304	050450	Q	80050	69086		2.450	+02	1466		
S1305	D5045C	0	80050	80086		1.500	10.	UGG		•
51300	D50510	•	80050	20086		2.700	102	900 900		
		Ç				2.700	+01	006		
\$1307	1501-44	0	80050	80087						
\$1307	M001.	60	80058	30.84	LT	1.700	100	UGL		
\$1308	050500	o	80051	80005		1.500	46.	206		
51367	BS6.60	õ	80051	009035		560	+01	160		
51310	0502.0	ů v	80051	80000		1.500	+	966		
S1311	BS07.00	ŏ	30051	80005		2.500	401	UBC		
51317	B507-4	õ	80051	000016			+01	CHER.		
		· ·		000 C C						
24.31.	WOST	60	· )····	1000004	; 1	:100	<u>† Gr</u>	1635		
81314	n0+1	0	29319	(20) $(20)$		1000	101	$\mathbf{t}_{i}^{*}$ $\mathbf{t}_{i}$		

.

79324 30083 5.800 +02 066 0 80042 80084 2.100 +02 UGL 45 -9 . 4 0 79324 83008 1.220 +03 866 8.500 +01 1.250 +02 0 79325 80083 066 Ō 79325 80088 ៈទេច 79325 79330 1.585 +04 UGG 3.550 +02 UGG 00 80088 80088 ò 79330 60008 8.000 +01 UGG 0 79330 80088 4.500 +01 UGG

51402

51404

S1408

S1409

S1410

\$1411

\$1413

51414

\$1415

.

.

D5002

W0020

D2008

05009

05010

D5011

05013

05014

D5015

.....**.....** 

. •

.

PARAMETER: PCB016

¢

4

SITE	SAMPLE	SAMFLE	SAMPLING	ANALYSIS		•	RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOCL	MNTSA	EXF	UNIT	ACRY	PREC
4	<b>22</b> 5121		********	1.2533.633	<b>#</b> 5 5 7 5	******	*****			3 <i>32233</i> 2
\$1102	A0066	1674	80183	80197	LT	1.100	+00	ՍԲԼ		
S1104	A0068	2543	80183	80197	LT	1.100	+00	UGL		
S1107	A0063	1936	80184	80197	LT	1.100	+00	UGL		
S1123	A0052	3792	80190	80197	LT	1.100	+00	UGL		
S1137	A0073	5456	80190	80197	LT	1.100	+00	OGE		
\$1413	W0051	10	80185	80197	LT	1,100	+00	ประ		

#### PARANLIER: PCB221

٠

τ.

4

SITE	SANFLE	SAMPLE	SAMFLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MrIT⊴A	E X F	UNIT	ACRY	PFEC
			*******	#=u=nuar	****	<b>.</b>	*****	r	******	
S1102	A0066	1674	80133	80197	LT	3.000	+00	UGL		
S1104	A0068	2543	80183	80197	LT	3.000	+00	USL.		
S1107	A0063	1936	80184	80197	LŤ	3.000	+00	UGL		
S1123	A0052	3782	80190	80192	LT	3.000	+00	LUL		
S1137	A0073	5456	80190	80197	LT	3.000	+00	UGL		
S1413	W0051	10	80185	80197	LT	3.000	+00	UGL		

PARAMETER: PCB232

.

.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULIS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	FOOL	MNTSA	EXF	UNIT	ACRY	PREC
		*****	THE SAGES		*****		====:	= . 1 <b>2 2 2</b> 2	*****	******
S1102	A0066	1674	80183	89197	LT	2.400	+00	UGL		
S1104	8300A	2543	80183	80197	LT	2.400	+00	97L		
\$1107	A0063	1936	80184	80197	LT	2.400	+00	∋GL		
S1123	A0052	3782	80190	80197	LT	2.400	+00	UoL		
S1137	A0073	5456	80190	80197	LT	2,400	+00	UGL		
S1413	W0051	10	80135	80197	LT	2.400	+00	UGL		

.

.....

. . . .

.

#### PARAMETER: PCB242

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMPLING	SAMPLING ANALYSIS			PEGULTS						
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	E XF	UNIT	ACRY	FREC			
				********		*******	*****						
\$1102	A0066	1674	80193	80197	LT	1.300	+00	ՍՅԼ					
S1104	A0058	2543	80133	80197	LT	1.300	+Ò0	UGL					
S1107	A0063 1	1936	80184	80197	LT	1.300	+90	UGL					
\$1123	A0052	3782	80190	80197	LT	1.300	+00	UGL					
S1137	A0073	5456	80190	80197	LT	1.300	<b>4</b> 90	UGL					
S1413	W0051	10	80185	80197	LT	1.300	+00	U6 <b>6</b>					

PARAMETER: PCB248

,

•

.

,

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

. . . .

. . . .

. •

.

SITE	SAMFLE	SAMPLE	SAMPLING	ANALYSIS			RESULTS					
IDENTIFICATIO	IN NUMBER	DEFTH	DATE	DATE /	ROOL	MNISA	EXE	UNIT	ACRY	PREC		
***************************************		******			==45;							
S1102	A0066	1674	80133	80197	LT	7.000	-01	UGL				
51104	8000A	2543	80183	80197	LT	7.000	-01	UGL				
S1107	A0063	1936	80184	80197	LT	7.000	-01	ՄՅԱ				
S1123	A0052	3782	. 80190	80197	LT	7.000	-01	UGL				
\$1137	A0073	5456	80190	80197	LT	7.000	-01	UGL				
S1413	W0051	10	80195	<b>30</b> 197	LT	7.000	-01	UGL				

# PARAMETER: PCB254

.

SITE	SAMFLE	SAMFLE	SAMPLING	ANALYSIS			RES	ULIS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL	MNTSA	EXF	UNIT	ACRY	FREC
	#23 <b>8</b> 22	******	uvciaesa	55184555	=====	11290 A 113 <b>8</b>				*****
S1102	40066	1674	80183	80197	LT	2.400	+00	UGL		
S1104	80048	2543	80183	80197	LT	2.400	+00	UGL		
S1107	A0063	1936	80184	8019 '	LT	2.400	+00	UGL		
S1123	A0052	3782	80190	E0197	LT	2.400	100	96L		
<b>S11</b> 37	A0073	5456	80190	80197	LT	2.400	+00	UGL		
S1413	W0051	10	80185	80197	LT	2.400	+00	UGL		

٠

...

. •

PARAMETER: PCB260

.

.

SITE	SAMPLE	SAMFLE	SAMPLING	ANALYSIS	RESULTS						
IDENTIFICATION	NUMPER	DEFTH	DATE	DATE	50CL	MNTEA	F XF	UNIT	ACRY FF	(EC	
Cortegel, note		*=====		*******	****	*******	****				
51102	A0066	1674	80183	80197	LT	2.300	+	UGL			
S1104	40068	2543	80183	80197	LT	2.300	<b>+</b> €0	UGL			
S1107	A0063	1936	80184	80197	LT	2.300	+00	UGL			
S1123	A0052	3782	80190	80197	LT	2.300	+01	UGL			
S1137	A0023	5456	80190	80197	LT	2.300	+04	NCL			
S1413	W0051	10	80185	80197	LT	2,300	+00	UGL			

•

,

PARAMETER: PH

.

٠

S1T£	SAMF'L E	SAMPLE	SAMPLING	ANALYSIS			ULTS	 
DENTIFICATION	NUMBER	DEFTH	DATE	DATE	BOOL MNTSA			PREC
S1117-W108	A0050	3321	80193	80193	7,100	+ 50		
S1121-W106	A0056	1500	80189	80196	7.200	+0		
81123-WikeF	A0052	3782	80190	80196	7.000	+00		
51128-WD06	A0057	1958	80189	80196	7.200	+01		
S1134-WDNR	A0070	4176	80194	80198	7.100	+00		
S1135-WDNR	A0071	4633	80194	80198	6.700	+00		
\$1136-WD#R	A0072	4572	80194	80198	7.200	400		
S1301	D5035	122	80049	80149	7,200	+00		
51301	M0005C	0	8/049	80249	7.000	+60		
\$1302	D5038	122	80049	80149	6.700	+00		
\$1302	M0006	0	80050	80249	6.800	+00		
S1303	P5041	305	80050	80249	7.600	+60		
S1303	M00070	0	80050	80249	7.500	+0		
51304	DS044	183	80050	30249	7.200	400		
S1304	M00100	0	30050	60249	6.900	+00		
S1365	115047	122	80050	80249	6.800	+00		
S1305 S1305	M0012	0	80050	80249	8.600	+00		
51305 51305	D5050	183	80050	80247	7,300	+00		
S1308 S1306	h0013C	183	80050	80247	5.900	+00		
S1308 S1302	D5053	183	80050	80249	7.500	+00		
		-						•
S1307	M0015	0	80050	80249	7.000	+00		
S1308	15055	o	80051	80249	6.600	+012		
S1308	P5054	122	80051	80249	6.200	+00		
\$1309	n5058	0	80051	80249	6.900	400		
\$1309	D5059	61	80051	80249	7.000	400		
51310	1/5061	0	80051	80249	2.000	<b>+</b> 00		
\$1310	DS082	61	80051	80249	6.800	100		
S1311	05064	0	80051	80249	e • 900	+60		
S1311	DS085	61	80051	86249	6.00	+00		
\$1312	05007	0	80051	80249	6.500	+00		
\$1312	05063	61	80051	80249	6.300	+00		
81313	M0018	0	79319	80249	6.400	+00		
	M0017	ŏ	79319	80249	6.400			

# PARAMETER: PPIDD

.

,

.

4

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMF'L E	SAMFLE	SAMPLING	ANALYSIS	PESULTS							
IBENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL	MNTSA	Exi	UNIT	ACRY	PREC		
		******		*******		============						
\$1102	40066	1674	80183	80197	LT	6.300	-02	66L				
\$1104	A0058	2543	80183	80197	LT	6.300	-02	UGL				
S1107	A0063	1936	80184	80197	LT	6.300	-02	UGL				
S1113	A0052	3782	80190	80197	£Τ	c.300	-01	UGL				
S1137	A0073	5456	80199	80197	LT	6.300	-02	UGL				
S1413	W0051	10	80185	80197	LT	6.300	-02	UGL				

. •

PARAMETER: PPDDE

ŧ

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	RECULTS						
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	ROOL	MNTSA	E <f< th=""><th>UNIT</th><th>ACRY</th><th>PREC</th></f<>	UNIT	ACRY	PREC	
			********	TF:=UIRS	*****			. = = = = = =		227222	
\$1102	A0066	1674	80183	80197	LT	1.100	-01	UGL			
S1104	8300A	2543	80183	80197	LT	1.100	-01	UGL			
S1107	A0063	1936	80184	80197	LT	1.100	-01	UGL			
\$1123	A0052	3782	80190	80197	LT	1.100	-01	UGL			
S1137	A0073	5456	80190	80197	LT	1.100	-01	UGL			
S1413	W0051	10	80185	80197	LT	1.100	-01	UGL			

• .

# BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

PARAMETER: PPDDT

٠

t ,

SITE	SAMPLE	SAMPLE	SAMPLING	RESULTS							
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	POOL	MNTSA	EXP	UNIT	ACRY	PREC	
*************	******	******	*******	F2221173	= - = = = = =	*******	z== = = =			92222 <b>2</b>	
\$1102	A0065	1674	80183	80197	LT	9.200	-02	UGL			
S1104	A0058	2543	80183	80197	LT	9.200	-02	UGL			
51107	A0063	1936	80184	80197	LT	9.200	-02	UGL			
S1123	A0052	3782	80190	80197	LT	9.200	-02	UGL			
S1137	A0073	5456	80190	80197	LT	9.200	-02	UGL			
S1413	W0051	10	80185	80197	LT	9.200	-02	UGL			

•

.

PARAMETER: SP

.

.

.

٠

t.

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS	RESULTS							
IDENTIFICATION	NUMBER	DEPTH	DATE	ŪA≚E	BOOL	MNTSA	EXF	UNIT	ACRY	PREC		
	******	*****	********	********		******	<b>z</b> cr					
S1102	A0066	1674	80183	80225	LT	6.000	+00	UGL				
S1104	80048	2543	80183	80225	LT	6.000	+00	UGL				
S1107	A0063	1936	80184	80225	LΤ	6.000	+00	UGL				
S1108	A0064	886	80184	80225	LT	6.000	+00	96L				
S1121	A0056	1500	80189	80225	LT	6.000	+00	UGL				
S1123	A0052	3782	80190	80225	LT	6.000	+00	UGL				
S1128	A0057	1958	80199	80225	LT	6.000	+00	UGL				
S1133	A0061	2878	80185	80225	LT	6.000	+00	UGL				

. \*

PARAMETER: SE

-

١.

.

# BADGER AAF - CHEMICAL ANALYSIS RESULTS BY TEST NAME

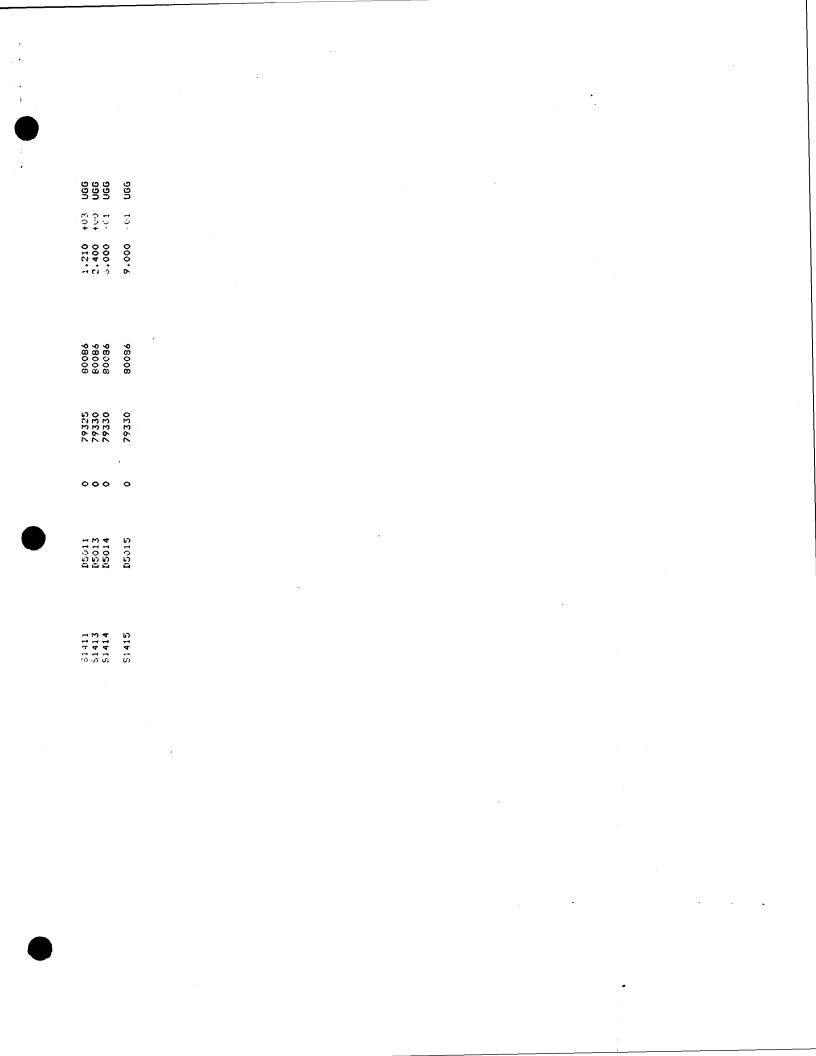
SITE	SAMFLE	SAMPLE	SAMPLING	ANALYSIS			RESULTS					
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	POOL	MNTSA	EXE	UNIT	ACRY	PREC		
	=====	======	Lazzerer		a1 7 8 5							
S1102	A0066	1674	80183	80225	LT	2.000	+00	UGL				
51104	A0068	2543	80133	80225	LT	2.000	+00	UGL				
S1107	A0063	1936	80184	80225	LT	2,000	40C	UGL				
S1108	A0004	886	80184	80025	LT	2.000	+00	UGL				
S1121	A0056	1500	80189	80225	LT	2.000	<b>+</b> 00	UGL				
\$1123	A0052	3782	80190	80225	LT	2,000	+00	UGL				
S1128	A0057	1958	80189	80225	LT	2.000	+00	UGL				
S1133	A0061	2878	80185	80225	LT	2.000	+00	UGL				

PARAMETER: SN

.

SITE	SAMFLE	SAMPLE	SAMFLING	ANALYSIS			RES	ULTS		
IDENTIFICA			DATE	PATE	BOOL	MITSA			ACRY	PREC
		Ev2220		********		=======				
S1102	A0001	1370	80051	80084	LT	1.800	+01	UGL		
S1104	A0002	2283	80051	80084	LT	1.800	+01	UGL		
S1107	A0003	1453	80056	80086	LT	1.800	+01	UGL		
S1108	A0004	. 575	80056	80084	LT	1.800	+01	UGL		
51109	A0005	2650	80057	80084	LT	1,800	+01	UGL		
C1111	****	2411	00050	80004		1.800	+01	UGL		
S1111	BOODA	2411	80058	80084	LT		+01	UGL		
S1112	40006	1981	80057	80086	LT	1.800				
S1115	A0007	2747	80057	80084	LT	1.800	+01	UGL		
S1117	A0009	2799	80058	80084	LT	1.800	+01	UGL		
S1119	A0010	3128	80058	80084	LT	1.800	+01	UGL		
S1121	A0014	1206	80058	80084	LT	1.800	+01	UGL		
S1122	A0011	3914	80052	80084	i T	1.800	+01	UGL		
S1123	A0013	2652	80053	80084	LT	1.800	+01	UGL		
S1125	A0015	3609	80058	80084	LT	1.800	+01	UGL		
S1125 S1127	A0012	1989	80052	80084	LT	1.800	+01	UGL		
51127	HODIZ	1767	80002	00004	۲,	1.000	701	UGL		
S1130	A0020	2461	80058	80084	ιT	1.600	+01	UGL		
51133	A0021	1944	80053	80084	L.T	1.800	+01	UGL		
S1134	A0022	4343	80058	80084	ĹŤ	1.800	+01	UGL		
S1202	M0001	0	80050	80083		4.500	-01	UGG		
S1202	M0002	ŏ	80051	90088		2.800	+00	UGG		
51205	110002	v				2.000				
\$1204	M0063	0	80050	30085		1.200	+00	'J6C		
S1205	0502?	ò	80050	80086		4.700	+00	066		
S1206	D5029	ŏ	80053	80086		3.900	+00	UGG		
\$1207	M1004	ŏ	80053	80086		1.100	+00	UGG		
S1301	150360	ŏ	80049	80085		1.500	+00	UGG		
31301	1000000	v	60047	00000		1.000	100	000		
S1301	W001a	60	80058	80064	LT	1.800	+01	UGL		
S1302	D503 C	0	80049	80086		4.000	-01	UG <b>G</b>		
S1303	D50400	0	80050	60086		6.000	-01	UGG		
S1304	D50450	0	80050	80083		1.000	+00	UGG		
S1305	D50480	0	80050	80089		7.000	-01	UGG		
6170	brort.		00050	00001		1 400	100	066		
S1306	150510	0	80050	80086		1.400	+00			
S1307	I:5054C	0	80050	80089		4.000	+00	UGG		
91307	W0012	60	80058	80084	LT	1.800	+01	UGL		
S1308	D5057C	0	80051	30086		1.300	400	UGG		
51309	<b>1/50</b> 670	Ŷ	80051	80084		2.000	-01	U66		•
\$1310	<b>B</b> 50630	0	80051	80085		1.000	+00	066		
S1311	D5066C	ő	80051	80083		7.000	-01	900		
S1312	1506-30 1506-30	ŏ	80051	80060		1.100	+00	000		
51312	W0019	60	80001	50084	LT	1.800	+01	000 06L		
81314	M001	60 0			1.1	7.000	-01	066		
·· 1 ·· 1 ·4	1001	Ū.	79317	80086		7.000	-01	000		
S1314	W001%	60	7931¥	80084	1 1	1.800	+01	UGL		
1.149.1	D569.2	o	29324	5000A		8.500	4. 9	11.15		
51404	D5-033	0	3042	3005A		2.950	<b>+</b> 0-,	056		
314-34	WOOD	45	80042	80044	LT	1.800	+01	+ 60		
514 38	<b>₽</b> C008	0	77324	STOPPE		5.650	+₹ !	066		
		-				<u>-</u>		_		
14	http://www.	0	293.0	$(1, \phi)$ (3)		• • • • •	4	чъĢ		
· 1 • 1 ·	056.5	e	79325	State - Law		····00	<del>1</del> * 11	*La1 s		

BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME



PARAMETER: SO4

.

•

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	POOL	MNTSA	EXF	UNIT	ACRY	PREC
*************		*****		*******			*****	*****		******
										•
S1102	A0001	1370	80051	80059		1.420	+02	NGL	42	2
S1104	A0002	2283	80051	80059		9.200	+01	MCL	27	3
S1107	A0003	1453	80056	80059		1.600	+01	MGL	5.0	16
\$1108	A0004	575	80056	80059		1.560	+02	mGL	46	2
S1109	A0005	2650	80057	80009		2.800	+01	ոսլ	8	9
S1111	80008	2411	80058	80078		1.700	+01	MGL	+5	14
S1112	A0006	1981	80057	80057		3.300	+01	MGL	10	7
S1115	A0007	2747	80057	80059		1.800	+01	MGL	5	13
\$1115	A0007	2747	80057	80059		1.800	+01	MGL	-5	13
S1117	A0009	2799	80058	80078		4.030	+01	MGL	+12	6
51119	A0010	3128	80058	80079		3,900	+01	mGL	+12	6
S1121	A0014	1206	80058	80078		2.000	+01	MGL	+6	12
51121		3914		80057		4.000	+01	MGL	12	
	A0011		80052				+01		8	
S1123	A0013	2652	80053	80059		2.800	+01	1162 MGL	8 5	14
\$1127	A0012	1989	80052	8005?		1.700	+01	NGL	2	14
51130	A0020	2461	80058	80092		3.000	+01	MGL	+9.0	8
S1130	A0053	3485	80190	80193	LT	5.000	+00	MGL		
S1131	A0054	4599	80190	80193	LT	6.000	+00	MGL		
S1132	A0058	4496	80189	80193	LT	6.000	+00	MGL		
\$1133	A0021	1944	80053	80092		5.300	+01	MGL	+20	4
G1134	A0022	4343	C0058	80078		2.370	492	MGL	+70	1
S1201	05018	4343	80046	80092		1.300	+93	UGG	+18	1
S1202	M0001	0	80048	80092		3.440	+02	000	+4	.3
S1202 S1203	H10001	ŏ	80051	80072		5.610	+02	000	+9	.1
		-					+01	066	+.7	2
S1204	M0003	0	80050	80092		5.820	TUI	000	τ.,	4
S1205	D5027	0	80050	80092		2.020	+01	000	+.20	5
S1206	D5029	0	80053	80092		1.520	+01	UGG	+.20	7
S1207	M0004	0	80053	80092		1.930	+0.°	UGG	+2.0	.5
S1301	<b>D5</b> 0350	0	80049	80092		6.300	+01	006	+1	2
S1302	D5039C	0	80049	80092		1.010	+02	U66	+1	1
\$1303	0504.00	0	80050	80092		1.130	+0.3	URG	+1	.9
51364	DS0450	0 0	80050	80092		3.800	+02	066	+5	.3
S1305	100450 1050480	ŏ	80050	80092 80092		1.450	+02	000 060	+2	.3
S1306	D50510	ŏ	80050	80050		1.490	+00	900	+2	.7
S1307	D50540	Ŭ,	80050	80092		2.280	4.0	واران	13	.4
		-							-	
S1307	W9017	60	80058	80023		2.100	+01	MPL	+6	11
\$1308	DS057C	0	80051	800 P2		4,550	+91	666	+.5	2
\$1309	050800	0	81051	80625		1,230	+02	665		
< 1 × 1 0	1450 <i>6</i> 30	0	80054	Server 1		. 100	4.99	.456	+1	1
81311	D5066C	0	80051	80045	LT	1.000	+91	.u.15		
81313	1150a	o	20051	(2004,52 <b>.2</b>		5. 100	+61	0.55	+1	1
1111	0001	50	20053 20053	santa proje		0. 00 1.200	- <del>1</del> 91 - 101	~1.1	+ 7 + 7	10
1.4.7.4. 5.3.4.7.4	m0/01	0	20053	anne pr Aire N Te		5.275	- 70 +01	- 106	+ . 7%	2
	DSrog	0	79319 79320	200 S.C. 800 S		5-275	+01	- 11-15 - 11-15	+.20	 
1. <b>1</b> . 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	WO0.	45	9042 	80050		200	+01	met.	5	13
201000		<b>4</b> J		6112 N			1	5 0 ° L	J	1.5
.14	[15.	O	11 J 2 A	· · ·		7.149	4.5	160	1.1	3
1 1 1 M	$D_{\mathbf{c}} \leftarrow c$	0	14.2.2	and the second		- 10	10	·· - G	+ - 3	4

D5010 D5011 D5013 79325 79325 79330 80092 80092 80092 S1410 S1411 0 0 0 5.360 +01 UGG 2.530 +01 UGG 4.680 +02 UGG +.6 +.3 +5.5 2 4 •2 S1413 2.990 +02 UGG 1.520 +91 UGG 0 0 •3 7 05014 79330 80092 +4 +.2 S1414 S1415 D5015 79330 80092

PARAMETER: SULFID

•

.

t

# BADGER AAP - CHEMICAL ANALISIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEFTH	DATE	DATE	ROOL	MNTSA	EXF	UNIF	ACRY	PREC
************	*****		********			******	<b>48</b> 853		281222	222132
S1117-WDWR	A0050	3321	80193	80224	LT	1.000	+00	MGL		
S1121-WINE	40056	1500	80189	80192	LT	1.000	40C	MGL		
S1123-WDVR	A0052	3782	80190	80192	LT	1.000	+00	MGL		
\$1128-WDHR	A0057	1958	80189	80192	LT	1.000	+00	MGL		
\$1134-WDMR	A0070	4176	80194	80224	LT	1.000	400	MGL		
S1135-WDWR	A0071	4633	80194	80224	LT	1.000	+00	MGL		
S1136-WDAR	A0072	4572	80194	80224	LT	1.000	+00	MGL		

PARAMETER: TL

SITE 1DENTIFICATION	SAMPLE NUMBER	SAMPLE DEPTH	SAMPLING DATE	ANALYSIS DATE	800L	MNTSA	RE 5 EXF	ULTS UNIT	ACRY	FREC
S1102	A0066	1674	80183	80225	LT	3.000	+00	UGL		
S1104	8600A	2543	80183	80225	LT	3.000	+00	UGL		
S1107	A0063	1936	80184	80225	LT	3.000	+00	UGL		
S1108	A0054	886	80184	80225	L.T	3.000	100	UGL		
S1121	A0056	1500	80189	80225	LT	3.000	+00	UGL		
S1123	A0052	3782	80190	80225	ĿТ	3.000	+00	UGL		
\$1128	A0057	1958	80189	80225	1 T	3.000	+60	UGL		
S1133	A0061	2878	80185	80225	LT	3.000	+00	UGL		

.

. . . . . .

### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

.:

#### FARAMETER: TXPHEN

1

#### BADGER AAP - CHEMICAL ANALYSIS RESULTS BY TEST NAME

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS			RES	ULTS		
IDENTIFICATION	NUMBER	DEPTH	DATE	DATE	BOOL	MNTSA	EXF	UNIT	ACRY	PREC
**bazaikanlus <b>a</b>	*****	*****	********	Ensuouda'	=2285	******	<b>ZZ</b> ¥8.3	*****		*****
\$1102	A0066	1674	80183	80197	LT	8.900	+00	UGL		
S1104	A0068	2543	80183	80197	LT	8.900	<b>+0</b> 0	UGL		
S1107	A0063	1936	80184	80197	LT	8.900	+00	UGL		
S1123	A0052	3782	80190	80197	LT	8.900	+00	UGL		
S1137	A0073	5456	80190	80197	LĨ	8.900	+00	UGL		
S1413	W0051	10	80185	80197	LT	8.900	+00	UGL		

.

•

PARAMETER: 24DNT

ŧ

SITE	SAMPLE	SAMPLE	SAMPLING	ANALYSIS				ULTS		
IDENTIFICATION	NUMBER	DEFTH	DATE	IATE	FOCL	MNTSA	EXF	UNIT		FFEC
		202022		*****						
S1102	A0066	1674	80183	S0197	LT	1.300	-01	UGL		
S1163	A0067	3586	80182	80197	LT	1.300	-01	UGL		
S1104	A0068	2543	80183	80197	LT	1.300	- (1)	UGL		
S1105	A0062	3265	80184	80197	LT	1.300	-01	UGL		
S1107	A0063	1936	80184	80197	Lï	1.300	-01	UGL		
S1108	A0064	836	80184	80197	LT	1.300	-01	UGL		
S1109	A0059	2961	80185	80197	LT	1.300	-01	UGL		
51111	A0065	2709	20184	80197	LT	1.300	-0;	UGL		
S1113	A0055	1708	80187	80197	LT	1.300	-01	UGL		
S1121	A0056	150H	80189	80177	LT	1.300	-01	UGL		
S1122	A0060	4082	80185	80197	LT	1.300	-01	UGL		
S1123	A0052	3782	80190	80197	LT	1.300	-01	ՍԵԼ		
51130	A0053	3485	80190	80197	LT	1.300	-01	UGL		
S1133	A0061	2878	80185	80197	LT	1.300	-01	UGL		
S1201	D5019L	457	80046	80218		1.090	+02	NGG	+.46	4
S1201	D5019U	457	80046	80218		8.700	+01	NGG	+3.7	5
S1202	D5020S	91	80050	80249		6.310	+02	NGG	+2.9	K9
S1.202	050200	91	80050	80218	LT	9.000	+00	NGG		
S1202	D5021	457	80050	80218	LT	9.000	+00	NGG		
S1203	D5022	91	80051	80218		1.710	+04	NGG	+.72	C2
S1203	D5023	488	30051	80218		2.700	402	NGG	+1.1	31
51203	M0002	0	80051	80218		1.720	+05	NGG	+.73	2
S1204	D5024C	152	80050	80218		7.170	+02	NGG	3.05	59
51204	D5026	579	80050	80218		2.400	+01	NGG	+1.0	C4
\$1205	05027	0	80050	80218		4.000	+01	NGG	+1.7	11
91205	15028	457	80050	80218	ιΤ	9.000	+00	NGG		
S1205	M6050	18	60193	80218		2.570	+03	NGG	3210	56
S1206	D2029	0	80053	80218		5.700	+01	NGG	+2.4	07
\$1205	05030	457	80053	80218	LT	4.000	+00	NGG		
<b>\$1</b> 20a	M0051	19	30193	80218		2.510	+03	NGG	1110	16
S1207	105031	61	80053	80218	ET	9.000	+00	466		
S1207	D2032	457	30053	80218	LT	9.000	+0ú	NGG		

## APPENDIX J ANALYTICAL METHODS

## METHOD FOR WATER - 2,4-DNT AND NITROGLYCERIN

Follow EPA Method 609 except use a 15/85 methylene chloride/hexane mixture as the extraction solvent. After extraction concentrate in a Kuderna-Danish evaporator to approximately 0.5 ml. Place the concentrate on a 1 cm x 8 cm neutral alumina column (20 percent deactivated) and elute with 60 ml of 15/85 methylene chloride/hexane. Concentrate the eluate to ml in a Kuderna-Danish evaporator and cool. Add 5 ml of hexene and reduce the volume to albout 1 ml. Measure the final volume and add sufficient acetone and hexane to bring the final volume up to 2 ml with 20 percent acetone in hexane.

Continue analysis as in Method 609 using these chromatographic conditions:

Column: 6 feet x 2 mm I.D. glass column with 1.5 percent SP2250/1.95 percent SP2401 on 100-120 mesh Supelcoport

Detector: Electron Capture

Injection Temperature: 110°C

Column Temperature: 150°C isothermal

Flow Rate: 40 ml/minute agron/methane

### WATER AND FISH SAMPLES

×

•	Water Samples			
Parameter	Method (a)	Detection Level	Precision	Accuracy
Alkalinity COD	310.1 410.1			
Conductance	120.1			
Hardness	130.2			
pH	150.1	No Detection Level and	Precision and Accuracy req	uired
Sulfide	376.1			
Iron	236.1 with prep according to			
	EPA "Metals", 4.4.4.)			
Sulfate	375.2	5.7 mg/l	1.71	0.705
	y #NO3-WA-02	0.36 mg/1	0.196	1.64
	y #NO3-WA-02	0.25 mg/1	0.130	1.06
Metals - prep	"Metals" 4.1.4.	2.5.40/2	No Ducatatan and Bassin	
Silver Aluminum 202.1	272.2	2.5 µg/1	No Precision and Accur	acy required
Arsenic	206.2	6.3 µg/1		
Beryllium	210.2	47 µg/1		
Cadmium	213.2	$1.2  \mu g/l$		
Chromium	218.2	4.4 ug/1		
Copper	220.2	5.0 µg/1		
Nickel	249.2	8.1 µg/l		
Lead 239.1	, 239.2	1.7 µg/l	0.818	- 1.04
Antimony	204.2	5.5 µg/1	No Precision and Accura	
Selenium	270.2	2.0 µg/1	No Precision and Accura	
	, 282.2	17.5 µg/1	8.95	1.18
Thallium	279.2	2.9 µg/1	No Precision and Accura	
Zinc	289.2 245.1	15 µg/1	No Precision and Accura	
Mercury TKN	351.3	0.47 µg/l No Detection Level and	0.086 . Precision and Accuracy requ	0.985
Pesti publi	Method for Organochlorine cides in Industrial Effluents, shed in the Federal Register, 38, No. 75, Part II.			
		<i>(</i> )		
a-BHC		0.17µg/1	No Precision and Accura	acy required
β-ВНС γ-ВНС		0.035µg/l 0.028µg/l		
δ-BHC		0.026µg/1		
aldrin		0.033µg/1		
chlordane		0.11µg/1		
toxaphene		8.913/1		
heptachlor		0.12pg/1		
endrin		0.030µg/1		
dieldrin		0.15µg/1		
DDE		0.11µg/1		
DDT DDD		$0.092 \mu g/1$		
endosulfan I		0.063µg/1 0.025µg/1		
endosulfan II		0.064µq/1		
PCB 1016		1.1µg/1		
1221		3.0µg/1		
1232		2.4ug/1		
1242		1.3µg/1		
1254		2.4µg/1		
1248		0.70µg/1		
1260		2.309/1		
Dr. Ex Carbon Vo	alysis of Trihalomethanes in inking Water by Liquid/Liquid traction", EPA, Federal Register, 1. 44, No. 231, November 29,	2.3µg/1 •	No Precision and Accura	acy required
tetrachloride 19	79, р. 66683	0.26µg/1	No Precision and Accur-	кса тылтыр

## WATER AND FISH SAMPLES (Continued)

٠

Parameter	Water Samples Method	Detection Level	Precision	Accuracy
2,4-dinitrotoluenc	E EPA Method 609, Federal Register, Vol. 44, No. 233, December 3,	0.13µg/1	0.182	1.01
Nitroglycerin	1979	11µg/1	1.31	0.55
GC/MS Screen NVO VOA	Sampling and Analysis Procedures for Screening of Industrial Effluents, EMSL, USEPA, April 1977.		No Precision and Accuracy	required
Nitrocellulose A	rmy #NC-WA-01	2.05µg/1	No Precision and Accuracy	required
<u>Parameter</u> GC/MS Screen	Fish Samples <u>Method</u> Sampling and Analysis Procedures for Screening of Industrial Effluents, EMSL, USEPA, April 1977. With preparation	Detection Level	Precision	<u>Accuracy</u>

NOTES: (a) All methods are EPA except as noted

## SAMPLE PREPARATION -GC/MS ANALYSIS - FISH

This method is intended for the extraction of a broad spectrum of environmentally significant organics from fatty tissue, and the separation of these organics from the natural fats and oils prior to GC/MS analysis. The method has been tested mainly with fish tissue, but should be applicable to other types of tissues. The analysis of fish tissue is used to describe the method, with optional sample handling for the analysis of the whole fish, or just the potentially edible portions. The advantage of the method is that it is based on a significant amount of experience of several investigators over a number of years. The detection limit for the method is not known, but is estimated at 1-10 ug per kg of fish tissue.

The analysis of a reagent blank is required for each group of fish specimens extracted on a given day. The reagent blank analysis provides information about background and solvent contamination. Recovery data are not available for the total procedure since it is not possible to spike fatty tissue with known concentrations of organics and simulate natural conditions for the incorporation of these materials. Perhaps the best method of measuring the effectiveness of the extraction is to re-extract with a fresh portion of solvent, or with an alternative solvent, such as acetone-methylene chloride.

Solvents and other reagents should be purified as described under low boiling solvent extraction. For the analysis of large whole fish, a meat grinder is required. In all cases, a laboratory blender of about one quart capacity is also required. A gel permeation chromatograph equipped with a 2.5 x 50 cm column packed with BIO-RAD SX-2 beads is used to separate the natural fats and oils from the organics of interest.

Fish at the sampling site should be wrapped in aluminum foil, shipped in an ice chest packed with dry ice (preferred) or ice, and preserved in a freezer until analyzed. Small fish must be combined by sampling site and species to obtain the weight required for analysis. For the analysis of whole fish, the entire fish (or fishes) are ground directly, or, if necessary, chopped into pieces small enough to fit into the meat grinder. Grind the fish several times and thoroughly mix the ground material. Clean out any material remaining in the grinder and add this to the sample. For an analysis of the edible portions only, fillet the fish or fishes, and cut these into small pieces no larger than about two cubic centimeters each. Add enough dry ice to the blender to completely cover the blades. Homogenize the dry ice for about 30 seconds, and then add about 25 grams (weighed to the nearest 0.1 gram) of fish fillet chunks or ground whole fish along with more dry ice to the blender. Wait several minutes for the fish to freeze, homogenize for at least tow minutes, or until the mixture is free of lumps, and then add about 75 grams of purified anhydrous sodium sulfate to the blender. Homogenize for another two minutes, and pour the contents of the blender onto an aluminum foil sheet (one square foot). Homogenize additional dry ice and 25 grams of anhydrous sodium sulfate and transfer this to the same aluminum This operation services to rinse the blender of residual foil. fish residue. Mix the fish, sodium sulfate, and dry ice on the foil with a spatula. Carefully fold the aluminum foil into the form of an envelope, label, and place in a freezer at -15°C for 8-12 hours. The dry ice will sublime and the residue should be in the form of a granular lum-free material.

Extract the mxiture in a 250 ml Soxhlet extractor with 200 ml of a 1:1 mixture of a acetone-hexane for 8 hours. Cool the extract, transfer it to a Kuderna-Danish (K-D) apparatus, and concentrate it to about 3 ml. Remove the last traces of solvent with a gentle steam of dry nitrogen, and weigh the resulting oil. Dilute the oil with methylene chloride to a concentration of 100 mg/ml.

Inject the total amount of diluted extract, in 5 ml aliquots, into the gel permeation chromatographic system. Elute each 5 ml aliquot with 225 ml of methylene chloride, at a flow rate of 3.5 ml per minute, and discard the first 160 ml of each eluate (this contains the natural oils and fats). Collect the balance (about 65 ml) of each eluate from each aliquot in the same 500 ml K-D flask. Concentrate the combined eluate containing the organics of interest to 5 ml. Analyze by GC/MS using the same conditions as soils and water for B/N column.

### SOIL SAMPLES

Parameter	Method	Detection Level	Precision	Accuracy
Pesticides and PCB's	"Method for Analyses of PCB's, Pesticides and Phthalates in Soils and Bottom Sediments," from Charactery Debendary Manual for Notton Sediments and Elutriate Testing, EPA, Central Regional Laboratory, Method Nos. 198-207, March 1979			
Ammonia (	"Ammonia Nitrogen in Bottem Sediments Compiled by Great Lakes Region Committee on Analytical Methods, EPA, December 1969, pp. 28-31, with color development according to EPA 350.2, Section 7.4	",		
Metals prep	"Interim Method for the Analysis of Elemental Priority Pollutants in Sludge", EMSL - Cincinnati, December 1978			
Al Pb Sn	EPA 202.1, 202.2 EPA 239.1, 239.2 EPA 282.1, 282.2	Not	able to establish able to establish able to establish	
Diethyl phthalate	EPA Method 606 preceded by sample prep and extraction according to "Method for Analyses of FCB's, Pesticides and Phthalates in Soils and Bottom Sediments", EPA, Central Regional Laboratory, Method Nos. 198-207, March 1979, steps 1-4	3.6µg/1	Precision and Accu required	iracy not
Di-n-butyl phthala	te	2.8ug/1	Precision and Accurrequired	racy not
PH 2,4-DNT	EPA 150.1 with prep EPA Method 609 with modifications	No Detection Level 8.86	and Precision and Accuracy	required 0.576
nitroglycerine	EPA Method 609 with modifications	No data	No data N	lo data
GC/MS Acid B/N	"Sampling and Analysis Procedures for Screening of Industrial Effluents", EMSL, USEPA, April 1977	No Detection Level	and Precision and Accuracy	required
NO3	Army #NO3-WA-02 plus prep	0.83µg/1		0.934
NO2 SO4	Aimy #NO3-WA-02 plus prep EPA 375.2 plus prep	0.6304/1 9.9µg/1		0.959 0.959
504	ark 575.2 filds prep	5. 9hg/1	3.09	<b>V</b> .:•5::
CEC	Methods of Soil Analysis, Part 2; C. A. Black, Editor; American Society of Agronomy, Inc., Madison, Wisconsin 1965	No Detection Level	and Precision and Accuracy	required
COD	EPA Methol 410.1 with modifications	Not	requirei	
Nitrocellulose	Army #NC-WA-01 with prep	Not	able to establish	

### SOIL PREPARATION FOR 2,4-DNT AND NITROGLYCERIN

Soxhlet extract 75g of air-dried sample with methylene chloride for eight hours. After the extraction is complete and the solvent cools, measure and record the volume.

Concentrate the extract to approximately 0.5 ml using a Kuderna-Danish. Place on the alumina column and continue as in the method for water.

### SOIL PREPARATION FOR NITROCELLULOSE

Extract 7.5g of air-dried sample with 200 ml methylene chloride in a soxhlet extraction for five hours. Discard the solvent extract. Re-extract the sample with 200 ml of acetone by soxhlet extractions for five hours. Evaporate to 20 ml under a stream of nitrogen. Continue as for water analyses at step 4 of Army Method NC-WA-Ol (treat acetone extract with sodium hydroxide).

Reference: "Method Development Plan", Environmental Science and Engineering, Gainesville, Florida.

### SOIL PREPARATION FOR pH

Slurry 20g of soil in a 50 ml beaker with 20 ml of deionized water. Stir the suspension several times during the next 30 minutes. Let the soil suspension settle for about one hour. Analyze for pH as in EPA 150.1.

Reference: "Methods of Soil Analysis", Part 2, Chemical and Microbiological Properties, C. A. Black, Editor, American Society of Agronomy, Inc., Madison, Wisconsin 1965.

### SOIL PREPARATION FOR NITRATE, NITRITE AND SULFATE

### Procedure

100g of soil was slurried in 250 ml of deionized water. The mixture is stirred twice over an eight hour period and allowed to settle out overnight. The sample is then filtered through a 0.45 micron filter and the filtrate is analyzed by Army Method #NO3-WA-02 for nitrate/nitrite or EPA #375.2 for sulfate.

## ANALYSIS OF SOIL FOR COD

Weigh out a portion (0.2 - 1.0 g depending on the concentration) of well mixed wet soil/sediment. Transfer to the COD flask and add 50 ml of distilled water. Continue as for a water sample in EPA method 410.1.

.

# INSTALLATION RESTORATION

SAMPLING AND ANALYSIS - CHEMICAL



	3	13	16	20	30	34		40	42	48	54	<u>56</u>	58	63	66	70	74	76	78 8
		SHPL	SITE	SITE	SAMPLE	8	ANALYSIS	LAB	SAMPLE	TEST	нтн	MER	NEA	MER	UNITS	ACCUR			
	DAIE	PRORM	TYPE	IDENTIFICATION	DEPTH	1c	DRIE		NUMBER	NAME	1	800	MANTISSA	EXPON				IR	LYSI
					1			۱. ۱		1	L.	L.							L.
-					<u><u></u>┥┈┶┈┷┈┷┈</u>	+			┝╌┺╌┹╴┹╶┻╌┶╴	<u> </u>	╞╼	<u>                                     </u>		h	- <b>44</b>	┟┸╼┺╼┻		-	
	<u></u>			· · · · · · · · · · · · · · · · · · ·		$\downarrow$					┦┵	4.							
		ļ	<b></b>		<u> </u>						<u>  .</u>	<u> </u>				<u> </u>			
					<u> </u>	$\square$	_				┟╍					h	Ļ		
<u></u>					hu		Luu							-4-4-		h			
					<b></b>							L					1.		
		L			1						<u> </u>				Luu		<u> </u>	-	
															h	L	L		
				1 1 1 1 1 1 1 1 1 1	Lui					<u></u>									
	<u></u>			 															
									4.4.4.4.4										
						Π													
						Π													
						П													
					┟┹╌┻╌┺╴					<b>L</b> LLL	<u> </u>	<u>∤</u>	<b>III_</b> _						
	<b></b>	┊╼┸╼┸╌┧	- <del></del>	· · · · · · · · · · · · · · · · · · ·	<u> </u>	$\mathbf{H}$	╶╺┧╼┦╌┥╌┥╌			┟╺┹╍┹╌┹╌╇╴	<u> -+-</u>			┠┻┺			$\uparrow$		
						H	<b>→→→→→</b>		┝╍╃╼╄╼╋╼╇┈╄┈	<u> </u>				┝╾┺╌	<mark>┤╶╄╴┺╶┺╴</mark>				╏╴╸
	- <b></b>	┟┵╼┥		╶╌┦╌╴╄╌╋╶╸╋╶╸╋╶╸╋╶╸╋╶╸╋		H		-	· · · · · · · · · · · · · · · · · · ·	╎┻┹┻┷┻┻	┼╌┹╌	-		┝╌┻╌┻				┥┹╴	┢┻┙
<u> </u>				Levenses	1_1_1_1	Ш	L						<u> </u>	L	LLL		<u> </u>	L	سبب

INS = INSTALLATION FA = FUNCTIONAL AREA T = DATA TYPE FIL = DATA FILE SC = SAMPLINO TECHN. CODE MTH = METHOD MEA = MEASUREMENT BOG = BOOLEAN PRE = PRECISION INSTR = INSTRUMENT EXPON = EXPONENT ACCUR = ACCURACY

REVISED 1-78

CDIR Form 13-2.1, 1 Sep 73

	Variable	Descriptions	Possible Entries
1	<ol> <li>Identification (Col. 1-5)</li> </ol>	Plant/Data	BASAC
4.	File (Col. 6-7)	Type of Sample	<pre>AT (animal-tissue) BE (benthic) BM (biota) CM (composite) DT (detritus) GW (ground water) PT (plant-tissue) QR (quality control primary standard) SE (sediment) SO (soil) SR (sewer) WD (wood) SW (surface water)</pre>
5.	Sample Date (Col. 8-12)	5 number Julian date when sample is taken.	79275 thru 79365 80001 thru 20366
6.	Sampling Program (Col. 13-15)	3 character (letter or number) abbreviation of the sampling program.	PRl (preliminary survey - Phase I)
7.	Site Type (Col. 16-19)	4 letter abbreviation to type of landmark, feature, or construction being identified. This description/identification will have grid coordinates associated with it; however, grid coordinates will be en- tered in map file.	BASN (basin) BORE (bore hole) CREK (creek) DAM (dam) DTCH (ditch, drainage) LAKE (lake) PIT (pit/tree spade) PLUG (shover sample) POND (pond) RVER (river) STRM (stream) STWA (standing water) SURF (surface-general) WELL (well)
8.	Sample Point (Col. 20-24)	Biology Hydrogeology/Geology	50001 thru 50999 51000 thru 51999
9.	Sample Depth (Col. 30-33)	4 numbers ( -sign for above ground sample) to designate depth from topographic surface to top of sample interval. Measurements in centimeters.	-999 thru 9999
10.	Sampling Technique (Col. 34)	l character (letter or number) used to differentiate critical sampling techniques.	<pre>A (clamshell) B (bail) C (composite grab) D (dredge) E (ekman grab) G (single grab) H (high volume sample) L (lysimeter) M (tensiometer) P (pump) S (split spoon core sample) T (shelby tube core sampling) A thru Z O thru 9</pre>
11.	Analysis Date (col. 35-39)	5 number Julian date when analysis was made.	79275 thru 79365 80001 thru 86366
12.	Laboratory (Col. 40-41)	2 letter abbreviation for laboratory.	EN (EEI) WZ (Warzyn)

### SAMPLING AND ANALYSIS VARIABLES FOR CHEMICAL ANALYSIS

.

\_\_\_\_

·····

		AMPLING AND ANALYSIS VARIABLES FOR CHEM (Continued)	ICAL ANALYSIS
	Variable	Descriptions	Possible Entries
13.	Sample Number (Col. 42-46)	Terrestrial Biology Aquatic Biology Soils or Parent Material Groundwater Sediment Water	B0001 thru B0199 B0200 thru B9999 D0001 thru D9999 A0001 thru A9999 M0001 thru M9999 W0001 thru W9999
	Test Name	6 character (numbers or letters) to identify the parameter being measured.	ALDRN (aldrin) ATNT (alpha trinitrotoluene 2,4,6 trinitrotoluene) BOD (biological oxygen demand) C6H6 (benzene) CD (cdemical oxygen demand) CODD (specific conductivity) CUTOT (copper total) DBP (dibutyl phthalate) DEP (diethyl phthalate) DLDRN (dieldrin) DO (dissolved oxygen) 24DNT (2,4-dinitrotoluene) ENDRN (endrin) HARD (total hardness) HGTOT (mercury total) NC (nitrocellulose) NG (nitroglycerine) NO2 (nitrite) NO3 (nitrate) SO4 (sulfate) SS (settleable solids) TDS (total dissolved solids) TDS (total organic carbon) TSS (total suspended solids) ZN (zinc) AG (silver) AL (alumimun) ALK (alkalinity) AS (arsenic) BE (beryllium) CLDAN (Chlordane) CR (chromium) FE (iron) HN3NZ (ammonia) HPCL (heptachlor) LIN (lindane) NZJEL.nitrogen, by Kjeldahl) PB (lead) PH (pH) PPDDD (2,2-bis(parachlorophenyl)- 1,1-dichloroethane) PPDDT (2,2-bis(parachlorophenyl)- 1,1,1-trichloroethane) SB (antimony) SE (selenium)
15.	Test Method # (Col. 54-55)	2 character designation of the method as standardized by the ASC and described in the Methods File. T indicates temporary method.	01 thru 99; Tl thru T9 DCPD tested by odor - T2
16	More was concreted based on	n	bb () the trade mound)

16. Measurement Boolean (Col. 56-57)

¥

1

2 letters used when measured quantity is below detectable limits. Detection limit de-termined by ASC-QC method.

- BB (below background)
  GT (greater than)
  LT (less than)
  ND (not detectable no odor)
  OD (positive odor test)

# SAMPLING AND ANALYSIS VARIABLES FOR CHEMICAL ANALYSIS (Continued)

	Variable	Description	Possible Entries
17.	Measurement Mantissa (Col. 58-62)	5 numb <b>ers (4</b> digits pl <b>us</b> decimal) for normal scientific notation.	1.000 thru 9.999
18.	Measurement Expenent (Col. 63-65)	3 numbers (+ or - sign plus 2 digit) exponent to base 10 (plus (+)/minus(-) sign mandatory]	-99 to +99
19.	Measurement Units (Col. 66-69)	4 letter abbreviation of units of measurement.	PPB (parts per billion) PPK (parts per thousand) PPM (parts per million) PPT (parts per trillion) blank (pH) MGL (milligrams/liter) MHC (micromho/cm - conductivity) MHO (micromho - conductance)
			Water
			GL (gram/liter) MGL (milligram/liter) UGL (microgram/liter) NGL (nanogram/liter) KG (kilograms) PGL (femtogram/liter)
			<u>Soil</u>
			GG (gram/gram) MGG (milligram/gram) UGG (microgram/gram) NGG (nanogram/gram) PGG (picogram/gram) FGG (femtogram/gram)
20.	Accuracy (Col. 70-73)	4 number estimate of systema- tic error and the direction by which the measurement has already been corrected	-999 thru +999
21.	Precision (Col. 74-75)	2 number estimate of variabil- ity caused by random error. Parameter developed by ASC. Measured in percent (%).	00 thru 99 Cl thru C9 (100%-900%) Kl thru K9 (1000%-9000%)
22.	Instrument # (Col. 76-77)	2 number code for lab instru- ment for differentiating same type in lab.	00 thru 99
23.	Analyst (Col. 78-80)	3 letter initials of indivi- dual responsible for measure- ment.	AAA thru 222

# WATER SAMPLING

# FIELD NOTES

1 6 8	13	16	20		30	34
SAMPLE DATE	SMPL PRCRM	SITE TYPE	SAI POINT	NUMBER	SAMPLE DEPTH	S C
BASAC	P.R.1					$\Box$
BiAisine	P.R.1		···· • ··· • ··· • ··· • ··· •			
BASAC	P.R.1					
	┝╍┝╌		<u> </u>			
B.A.S.A.C.	P.R.1					
BASAC	P,R,1					
BASAC	P.R.1			<u> </u>	│ │── <del>⋏</del> ── <b>⋏</b> ──	
BASAG	P.R.1		-1-1-1-1-			
BASAG	P.R.1		-1-1			
	┟╌┺╌┺		- <del>  _   _  </del>			
BASAS	P.R.1					
	<u> </u>					
BASACT	P.R.1					Ш

<u>Col.</u>	Variable	Entry
6-7	Sample source	GW-ground SW-surface
8-12	Sample date	79275-793 8££Ø1-8Ø3
16-19	Site type	EASN(Basi FORE(Bore CREK(Cree DAM(DAM) DTCH(Ditc drai

SW-surface water 79275-79305 to 8g801-80366 HASN(Hasin) FC HORE(Bore hole) SI CREK(Creek) ST DAM(DAM) ST DTCH(Ditch, drainage) SU LAKE (Lake) PIT(Pit/Tree RS Spade) RM PLUL(Chovel W) Sample)

water

n) FOND (Pond) hole) SPRG (Spring) k) STRM (Stream) STWA (Standing h, water) nage) SURF (Surface a) water) ree RSER (Reservoir) e) RVER (River el WFLL (Well)

<u>Col.</u>	Variable
-------------	----------

20-24 Sample point
25-29 Sample number
30-33 Sample depth
34 Sample technique

### Entry

#### SØØØ1-S1999

AØØØ1-A9999 for ground water WØØØ1-W9999 for surface water Depth from topographic surface in centimeters B(Bail); C(Composite grab); G(Single grab); P(Pump);

H(High volume sample)

APPENDIX K GC/MS RESULTS ١.

.

#### SEDIMENT AND SOIL SAMPLES

Site	Fraction	Peak No.	Similarity 	Identity	Concentration <sup>(a)</sup>
c) 201	• <i></i>	1	0 0010	0 C disibustslusse	5
S1201	Acid	T	0.9815 0.8662	2,6-dinitrotoluene 1-pheny1-4-carboxy-4,5-dihydro-1H-1,2,3-triazole	,
			0.8651	2,4-DNT	
			0.8638	2-phenyl-5-carboxy-2H-1,2,3,4-tetrazole	
			0.8565	dibenzyl ether	
		2	0.9815	2,4-dinitrotoluene	35
		-	0.9814	2,5-DNT	
		3	0.9760	diphenylamine	28
		4	0.9826	di-n-outylphthalate (DBP)	135
		5	0.9815	o-nitrodiphenylamine	2
		-	0.9797	2-nitro-N-nitroso-N-phenyl-benzenamine	-
	B/N	1	0.9787	diacetone alcohol	420
		2	0.9817	2,6-DNT	38*
			0.8699	2,4-DNT	
			0.8591	o-nitrosobenzaldehyde	
		3	0.9817	2,4-DNT	998*
			0.9815	2,5-DNT	
		4	0.9808	diphenylamine	470*
			<b>0.9</b> 808	o-amirobiphenyl	
			0.8710	N,N-diphenylhydrazine	•
		5		no hits (phthalate)	8
		6		DBP	>1,300 (overloaded)*
		7	0.9816	o-nitrodiphenylamine	28
		-	0.8579	m-nitrodiphenylamine	r.
		8	0.9739	p-nitrodiphenylamine	5 8
		9		BEHP	8
S1204	Acid	1		no hits	<2
		2		no hits - probably 2,4-DNT	2
		3		no hits - probably diphenylamine	6
		4	0.9825	DBP	18
			0.8664	isobutyl o-phthalate	
	B/N	1		DBP	29*
	<b>D</b> /M	2	0.9786	citronellyl propionate	300
		-	0.8691	citronellyl formate	
			0.9780	thajylalcohol isomer	
			0.9776	camphane	
			0.8771	2-methene	
			0.8700	endo, endo-2, 6-divinyl-cis-bicyclo(3.3.0) octane	
			0.8693	2-sec-butylcvclohexanol	
			0.8574	cyclohexene, 3-methyl-6-(1-methylethyl)-, trans-	
			0.8551	P, 1-dimethy1-1, 3, 5-trisidacyclohexane	
		*		diphenylamine	1.8*

NOTES: (See lust page of table)

.

, ,

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
		1	0.9707	l-carbamoyl-3,5-dimethyl-2-pyrazoline	1
51206	Acid	T	0.8601	5-methyl~3-heptanol	•
			0.8496	y-valerolactone	
		2	0.9837	BEHP	<1
		-	0.9815	dioctylphthalate	
			0.8668	dioctylether	
			0.8641	2L-methyl-dodecanol-1	
			0.8572	1-decanol	
	B/N	1		no hits	<1
	-,	2		diacetonealcohol (no 1.s.)	NQ
		3		no hits	<1
		4		no hits	<1
		5		no hits	<1
		6		no hits	<1
		7		no library search - lack of detail (probably hydrocarbon)	<1
		8		no hits	<1
		9	0.9969	N6-(3-hydroxy-3-methylbutyl)adenine	<1
		10	0.9960	octahydro-l-(2-octyldecyl)-pentalene	1
			0.9958	l-hexacosanol	
			0.9957	6-octen-1-ol, 3, 7-dimethyl-propanate	
			0.9954	2L,4L-dihydroxycosanol	2
		11		blHP (no l.s.) DLP	0.02*
		*		DBP	0.14*
		,			< 2
S1207	Acid	1	• • • • • •	no hits	2
		2	0.9820		-
		3	0.8691 0.8543	isobutylphthalate 2'-deoxyinosinc	<2
		د	0.0343	2 - deoxy indsind	
	B/N	1	0.8657	diacetone alcohol	NQ
		2	0.8598	3-hexene+2,5-diol	<2
		3	0.9774	5-methoxy-2-pentanone	<2
			0.8605	diacetone alcohol	<2
		4		ne hits	<2
		5	0.9782	ceclopentylcyclopentane	~2
			0.8733	1,9-nonadediol	
			0.8730	nitric acid, nonyl ester	
			0.8718	1-octadecanol	
		6	0.8694	<pre>bicyclo[3.1.1]heptane,2,6,6-trimethyl (pinane) no hits</pre>	< 2
		6		no hits	<2
		7 9		no nits no hits	<2
		а 9		no hits	<2
		10		DBP (no 1.s.)	5.9*
		10			

.

.

NOTES: (See last page of table)

.

•

<u>Site</u>	Fraction	Peak <u>No.</u>	Similarity 	Identity	Concentration <sup>(a)</sup>
<b>S12</b> 07	в/::	11	0.9819 0.9814 0.9811	l-eicosanol hexadecanol tridecanol	<2
			0.9810 0.9806	2-methyl-1-dodecanol 2H-cyclopropa[3,4]naphth[1,2-b]oxirene	
		12	0.9806	BEHP (no l.s.)	<2
		*		DEP (NO 1.5.)	0.11*
		*		diphenylamine	1.1*
		*		2,6-DNT	0.50*
<b>S1301</b>	Acid	1		no hits	<2
		2	0.9776	5-(2-propynyloxy)-2-pentanol	<2
		2	0.8659	oxonane (oxacyclononane)	<2
		3 4	0.9803	no hits diphenylamine	1.5*
		-	0.9785	N,N-diphenylhydrazine	1.5
			0.9782	o-aminobiphenyl	
			0.8552	N,N-diphtnylurea	
		5	0.9799	DBP	3.1*
			0.9769	N-butylisobutylphthalate	
		6	0.8655	1-methy1-4-(1-methy1buty1)-cyclohexane	<2
		7		no hits	<2
		8		BEHP (no 1.s.)	<2
	B/N	1	0.9787	diacetone alcohol	52
		2	0,9801	<pre>bicyclo(4.2.0)octa-1,3,5-triene</pre>	<2
			0.9800	styrene	
		_	0.8697	cyclo octatetraene	
		3		no hits (hydrocarbon)	<2 <2
		4		no hits	<2
		5 6	0,9814	no hits l,l'-oxybis-octane (diactyl ether)	<2
		0	0.9801	3-chlorodecane	•
			0.9792	2,6,11-trimethyldodecane	
			0.9792	l-eicosene	
			0.9789	1-octadecene	
		7		diphenylamine (no l.s.)	3.1* ·
		8	0.8520	1,2,3,4-tetrahydro-2-phenylnaphthalene	< 2
		9		no hits	<2
		10	0.0074	DBP (no l.s.)	3.1* 6: searched as
		11	0.9876	2-hydroxy-6-methyl-4-(phenylmethoxy)benzaldehyde	a mixture,
			0.9860	2-hydroxy-3,6-dimethyl-4(phenylmethoxy)benzenemethanol	looks like it
			0.9856	4-(β-phenylethyl)-6-methyl-3-cyanopyrid-2-one 1,3-diphenyl-4-acetyl-delta 2-1,2,4-triazolin-5-one	contains some
			0.9848 0.9837	p-nitro-1,2,-diphenylamine	BEHP
			0.9031	p-nrcto-r,z,-oronenyramine	

NOTED: (See last page of table)

Site	Fraction	Peak	Similarity Indez	Identity	Concentration (a)
S1301	в/н	12	0.9782	3-phenyl-2-methylindole	2
			0.9782 0.8686	5-methyl-2-phoylindole 1-methyl-2,2-diphenylcyclopropane phenysulfioc	
			0.8503	2-pheny1-5-methylbene(D)(1,3)oxazepine	
		*		DEP	0.31*
S1307	Acid	1		no hits	4
		2		no hits	4
		3 4		no hits no hits	4
		5		no hits	< 4
		6		no hits	<4
		7	0.9812	o-aminobiphenyl	27
		,	0.9810	diphenylamine	= /
			0.9795	N,N,N'-triphenylurea	
			0.9788	N, N-diphenylhydrazine	
			0.8565	N,N-diphenylurea	
		8		no hits	4
		ğ	0.9815	DBP	12
			0.8756	isobutyl o-phthalate	
		10		no hits	4
		11		no hits	4
	B/N	1	0.9789	diacetone alcohol	ри
		2	0.9776	diacetone alcohol	4
		3	0.8612	methy1-2-methy1-3-oxobutanoate	50
		4		no hits	<4
		5	0.9809	diphenylamine	24*
			0.8693	N,N-diphenylhydiazine	
		6	0.8592 0.9771	N,N-diphenylurea	-
		U	0.8558	o'-xylene ethylbenzene	8
			0.8557	phenylpropionic acid	
		7	0.0000	no hits	4
		8		DBP (no 1.s.)	17*
		9	0.8554	o'-xylene	27
		10	0.9801	4-phenyl-1,2-dihydronaphthalene	15
		• •	0.8121	2-phenyl-methylbene(D)(1,3)oxatepine	25
			0.8646	1-methy1-2,2-diphenylcyclopropane phenylsulfide	
		*		DEP	0.23*
S1312	Acid	1		no hits	< 2
		2	0.9846	2-methyltridecane	< 2
			0.9813	1,1-dlbromo-2-chloro-2-fluoro-cyclopropane	
			0.9860	methyl-ll-bromo-undecanoate	
			0.9726	vencadifformine	
			0.97+3	glynerol tributyrate	

•

•

1

.

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
	<u>rideeron</u>			<u>i dente i oj</u>	
S1312	Acid	3	0.9821	methyl palmitate	<2
			0.9816	methyl-14-methylpentadecanoate	
			0,9302	methyl laurate	
			0.9809	methyl stearate	
			0.8758	methyl myristate	
		4	0.9831	butyl(butoxycarbonyl)methyl phthalate	<2
			0.9824	DEP	
			0.8623	iscbutyl o-phthalate	
		5	0.9801	tridecanol	<2
			0,9301	dimethy1-3,7-dimethyldecaredioate	
			0.9799	2-butyl-l-octanol	
			0.9797	hexadecanoic acid (palmitic acid)	
			0.9781	citronellol formaic	
		6	0.9813	1,2-dibromooctane	<1
			0.9812	tridecanol	
			0,9812	tetradecanol	
			0,9805	valeranone	
			0.9801	oleic acid	
	B/N	1		diacetone alcohol (no l,s,)	NQ
		2		no hits	2
		3		no hits	4
		4	0.9818	diisobutylphthalate	4
			0.9813	dibutylphthalate	
		5		DBP (no l.s.)	0.61*
		6		no hits	3
		7	0.9809	dioctyladipate	NQ
			0,8682	dioctylether	_
		8	0.9807	l-hexacosene	3
			0.9805	tetracosanol	
			0.9802	l-docosanol	
			0,9801	l-docosene	
			0.9796	hexadeutenoaoctadecanol	_
		9	0.9793	butyl butoxyethylphthalate	4
			0.8822	iso octylphthalate	
			0.8643	n-octacosane	
		10	0.9826	octacosane	6
			0,9822	pentacosane	
			0.9802	heptacosane	
			0.9799	7-hexyleicosane	
			0.9799	nor-pentacosane	
		11		no hits	3
	•	12		BEHP (no l.s.)	NQ

NOTES: One last page of table)

.

. . . .

.

٠

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
S1312	B/N	13	0.9822	triacoutane	4
01010	0/11	**	0.9821	11-decyldocosane	
			0.9819	octacosane	
			0.9815	pentacosane	
			0.8809	l-iodohexadecane	
		14		no hits	3
		15	0.9817	<pre>10,11-benzfluoranthene[benzo(j)]</pre>	3
			0.9317	3,4-benzfluoranthene	
			0.9817	benzo(k)fluoranthene	
			0.9815	pcriylene	
		• •	0.9792	benzo(e)pyrene	3
		16	0.9743	8-nonenoicacid, 9-(1,3,6-nonatrienyloxy)-, methylester	3
			0.9726 0.9706	cholestan-3-ol,2-methylene	
			0.9706	4α-methyl-δ-8,24-cholesteradienol 2-{2-octyldecyl)-cis-bicyclo[0.3.3]octane	
			0.8599	2 (heptadec7-ynloxy) tetrahydropyran	
		17	0.0399	no hits	3
		18		no hits	3
		*		DEP	140*
		*		diphenyiamine	91*
				······································	
S1314	Acid	1		no hits	<1
		2	0.8664	trans-8-menthene	<1
			0.8528	methyl linolelaidate	
		3		no hits - probably DBP	<1
	B/N	1	0.9786	4-methyl-3-penten-2-one (mesityl oxide)	NQ
			0.8554	2,4-dimethyl-2-pentene	-
		2		diacetone alcohol (no l.s.)	NQ
		3	0.8646	3-hexene-2,5-diol	NQ
		4		no hits	<1
		5	0.8337	2,3-dimethyl-2-hexene	<1
			0.8689	3,4-dimethy1-3-penten-2-one	
			0.8595	1,2,3,-trimethylcyclohexane	
			0.8550	2,5-dimethyl-3-hexene	
		-	0.8579	2,2-dimethyl-trans-hex-3-one	
		6		no hits	<1
		7 8		no hits	1
		8		no hits	<1
		10		no hits	<1
		11	0.9821	no hits DEP	<1 1.4*
		11	0.9737	propylphthalate	****
		ì2	0.9784	2,6,6-trimethyl-bicyclo(3.1.1)heptane	<1
		14	0.8755	2-cyclohexylethyl N-amylether	· · · ·
			0.8747	1,9-nonanediol	
			0.203	1,1'-bicyclopentyl	
			0.8620	3,5,5-trimethylcyclohexene	
				,	

NOTES: See ... st page of table)

•

٠

.

-----

.

٠

Site	Fraction	Peak	Similarity Index	T d	Concentration (a)
SILE	Fraction	No.	Index	Identity	concentration
S1314	B/:	13		no hits	<1
		14	0.8774	1,9-nononediol	<1
			0.8763	1-undecyne	
			0.8624	<pre>[2-(pentyloxy)ethyl]cyclohaxene</pre>	
			0.8519	1,12-trideondiene	
		15		no hits	<1
		16	0.9795	hexadecanol	<1
			0.9792	1-hexadecene	
			0.8733	3-chlorodecane	
			0.8673	dodecanol	
			0.8594	tetradecanol	
		17	0.9821	isobutyl o-phthalate	0.23*
			0.9818	DBP	
		18		no hits	<1
		19	0.9963	l-dodecanyl methyl ether	1
			0.9963	1-octadecanol	
			0.9962	hexadecanol	
			0.9962	l-hexadecanol	
			0.9962	2L-4D-dihydroxylicosane	
			0.9962	3,7-dimethy1-6-octen-1-ol	
			0.9442	1,12-tridecadiene	
		20	0.9811	l-eicosanol	<1
			0.9910	l-octadecanol	-
			0.9809	nonadecanol	
			0.9804	l-heptadecanol	
			0.9801	tridecanol	
		21		BEHP (no l.s.)	<1
		22		no hits	<1
		23		farnesyl cyanide (no 1.s.)	<1
		24	0.8744	1,2- ctadecanediol	<1
			0.8728	pentacoane	
			0.8705	l-hexacosanol	
		25		no hits	<1
		26		looks like a mixture - (no l.s.)	<1
S1402	Acid	1		no hits	<1
		2	0.9816	2,6-dinitrotoluene	2
			0.9787	2,4-DNT	
		3	0.9316	2,4-DNT	9
			0.9814	2,5-DNT	
		4	0.9828	butyl(butoxycarbonyl)methyl phthalate	6
			0.9824	UBP	
			0.8605	isobutyl phthalate	
		5		no hits	1

NOTES: (See last page of table)

5

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
S1402	B/N	1		no hits	6
		2		diacetone alcohol (no l.s.)	NQ
		3		no hits	5
		4		no hits	1
		5		no hits	1
		6		no hits	2
		7		no hits	1
		8		no hits	1 1
		.9		no hits	1
		10 11	0.8691	no hits methyl-13-tetradecynoate	1
		11	0.8758	2L,4L-dihydroxycicosane	•
		12	0.0/20	BEHP	5
		13		no hits	5
		*		DEP	0.9*
		*		DBP	0.8*
				551	•••
<b>S14</b> 08	Acid	1		no hits	<1
		2		no hits - probably DBP	ī
	B/1	1		diacetane alcohol (no 1.s.)	NQ
		2		no hits	2
		3		no hits	3
		4 ·		no hits	1
		5	0.9802	methyl palmitaic	3
			0.9776	methyl 14-methyl pentadecanoate	
		6	0.9822	diisobutylphthalate	2
		7	0.9992	methyl stearate	11
			0.9991	16-methyl methylheptadecanoate	
			0.9982	methyl aruchidate	
			0.9969	<pre>bicyclo[3.1.1]heptan-3-one,2,6,6-trimethyl</pre>	
. ~			0.9965	4-ethyl-2-octene	
the 2		8	0.9813	1-eicosanol	1
We is			0.9813	2L-4L-dihydroxycicosane	
and			0.9811	1-octadecanol	
pr			0.9810	monadecanol	
			0.9807	heptadecanol	,
11 million	•	9	0.9803	butylbutoxyethylphthalate	1 7 .
porte?	,	10	0.0000	BEHP (no l.s.)	2
	e chi	11	0.9830	octacosane	2
			0.9826	pentacosane	
			0.9806	heptacosane ·	
			0.9805	1-heptadecanol	
			0.9805	3-ethy1-5-(2-ethylbuty1)-ocladecane	

NOTES: (See last page of table)

M

1

\$1402       p.32       12       0.9823       11-decyclacosane       2         0.9812       11-octadecanol       0.9811       1-eicosanol       6         0.9810       pentacosane       6       6         0.9831       11-decyclacosane       6         0.9831       relacosane       6         0.9831       relacosane       6         0.9831       relacosane       6         0.9834       triacontane       1         0.9834       relacosane       1         14,15       0.8589       farnesol CAC = 472.514-0 MSDS Stays no htaith hazord       1         14,15       0.8589       farnesol CAC = 472.514-0 MSDS Stays no htaith hazord       1         14,15       0.9794       DEF       0.10*       1         14       0.9787       DBF       1       1       1         14       0.9787       DBF       1       1       1         15       no hits       1       1       1       1	Site	Fraction	Peak <u>No.</u>	Similarity Index	Identity	Concentration (a)
13       0.9837       11-dccyldcocane       6         0.9829       1-icdbexadecane       0.9829       1-icdbexadecane         0.9824       similar to 13       11         16       0.8859       farnesol CA* = 4452-74-0 MSDS 5445 no hteal/sh hazard       1         16       0.8859       farnesol CA* = 4452-74-0 MSDS 5445 no hteal/sh hazard       1         16       0.8859       farnesol CA* = 4452-74-0 MSDS 5445 no hteal/sh hazard       1         14,15       mo hits       0.10*       0.10*         0       0.9787       00P       0.17*         51409       Acid       no hits       0         2       no hits       0       1         4       0.9787       00P       41         4       0.9787       00P       41         5       no hits       6       6         6       0.6532       20,374-004 (b) -tetrahydrophthalide       41         5       no hits       41       41         6       0.6544       2,2,4-trimethy1-46-hydroxy-(6/(b))-tetrahydrophthalide       41         6       0.8544       2,2,4-trimethy1-40-tartapentane       42         0.8614       2,2,4-trimethy1-4-hitapentane       41      <	<b>S14</b> 02	B/11	12	0.9816 0.9812 0.9811	ll-decycldocosane l-octadecanol l-eicosanol	2
14,15       similar to 13       1 each         16       0.8589       farnesol CAC = 4/a/3-54-0 MSD5 5445.ne htal4h hazord       0.10*         DEP       DBP       0.10*       0.10*         S1409       Acid       1       no hits       0.17*         S1409       Acid       1       0.9787       DEP       1         S1409       Acid       1       diacetone alcohol (no l.s.)       NO       1         S1409       Acid       1       no hits       0.17*       1         S1409       Acid       1       diacetone alcohol (no l.s.)       NO       1         S1409       1       Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl-Acinethyl			13	0.9837 C.9831 0.9829 0.9834	ll-decyldocosane octacosane l-iodbexadecane squalane	<b>6</b>
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			14.15	0.9834	similar to 13	l each
Sl409         Acid         1         no hits no hits         <1           1         no hits         <1				0.8589	farnesol CACE 4602-84-0 MSDS SAUS no health hazard	1
S1409       Acid       1       no hits       <1					DEP	0.10.
$ \begin{array}{c c c c c c c c } 2 & & no hits & & & & & & & & & & & & & & & & & & &$			*		DBP	0.17*
$ \begin{array}{c c c c c c c c } 2 & & no hits & & & & & & & & & & & & & & & & & & &$	S1409	Acid	1		no hits	<1
4       0.9787       DBP       <1						
B/::       1       diacetone alcohol (no l.s.)       NQ         2       no hits       <1				0.9794	DEP	1
2       no hits       <1			4	0.9787	DBP	<1
2       no hits       <1		в/::	1		diacetone alcohol (no l.s.)	NQ
4       no hits       <1			2			<1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			3.		no hits	<1
6       0.8532 $2a_3a-dimethyl-4\beta-hydroxy-(\delta/(b))-tetrahydrophthalide       <1$					no hits	
7       0.9791       3-butyl-hexa-3-ene-2-one       <1			5		no hits	
0.8754       1,4-cinede         0.8544       2,2,4-trimethyl-4-nitrapentane         8       0.9786       2,5-dimethyldodecane         0.9782       5-butylnonane       <1						
0.8544       2,2,4-trimethyl-4-nitrapentane       <1			7			< 1
8       0.9786       2,5-dimethyldodecane       <1						
0.9782       5-butylonane         0.8614       2-ethyl-1-hexanol         0.8618       n-dodecane         0.8618       n-dodecane         0.8614       2,6-diethylcyclohexanone         0.8604       2,6-diethylcyclohexanone         10       no hits         11       0.9806       5,-methyl-5-ethyldecane         0.9789       pentadecane         0.9789       pentadecane         0.9789       hexadecane         0.9789       hexadecane         0.9789       hexadecane         0.9789       hexadecane         0.9789       hexadecane         13       no hits         14       no hits         15       no hits         16       0.9819       methyl,14-methyl pentadecanoate						
0.8814       2-ethyl-1-hexanol         0.8618       n-dodecane         0.8618       n-dodecane         0.8619       2,6-diethylcyclohexanone         9       no hits       <1			8			<1
0.8618       n-dodecane         0.6604       2,6-diethylcyclohexanone         9       no hits       <1						
9       no hits       <1						
9       no hits       <1						
10       no hits       <1			0	0.8604		0
11       0.9806       5,-methyl-5-ethyldecane       <1						
0.9793       heptadecane         0.9789       pentadecane         0.9789       hexadecane         0.9786       tetradecane         12       DEP (no l.s.)         13       no hits         14       no hits         15       no hits         16       0.9819         0.8741       methylpanlitate				0 6906		
0.9789         pentadecane           0.9789         hexadecane           0.9786         tetradecane           12         DEP (no l.s.)           13         no hits           14         no hits           15         no hits           16         0.9819           0.8741         methyl,l4-methyl pentadecanoate			**			- •
0.9789         hexadecane           0.9786         tetradecane           12         DEP (no l.s.)           13         no hits           14         no hits           15         no hits           16         0.9819           0.8741         methyl,l4-methyl pentadecanoate					•	
0.9786       tetradecane         12       DEP (no 1.s.)       1*         13       no hits       <1						
12     DEP (no l.s.)     1*       13     no hits     <1						
13       no hits       <1			12			1*
14     no hits     <1						<1
15         no hits         <1           16         0.9819         methylpamlitate         <1						
0.8741 methyl,l4-methyl pentadecanoate						
			16	0.9819	methylpamlitate	<1
0.8603 methyl.13-methyl pentadecanoate				0.8741	methyl,l4-methyl pentadecanoate	
				0.8603	methy1,13-methy1 pentadecanoate	

NOTES: (See last page of table)

•

. . . . . . .

.....

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
				Identity	concentración
S1409	B/N	17	0.9822	di-isobutylphthalate	<1
			0.9821	dibutylphthalate	<1
		18	0 0 0 1 0	no hits	1
		19	0.9818	methyl stearate methyl-16-methyl(heptadecanoate)	Ŧ
			0.9816 0.9816	methyl behenate	
			0.9812	methyl alachidate	
			0.9800	2L,4L-dihydroxycicosane	
		20	0.0000	no hits	<1
		21	0.9816	2L-4L-dihydroxycicosane	<1
			0.9812	nonadecanol	
			0.9797	l-docosanol	ł
			0.9795	l-docosene	
			0.9790	1,2-octadecanediol	
		22	0.9811	butylbutoxylethylphthalate	<1
			0.9793	2-butoxy-2-oxyethyl butyl phthalate	
			0.8824	butyl phthalyle butyl glycolate	_
		23		BEHP (no l.s.)	<1
		24		farnesyl cyanide (no l.s.)	<1
		*		DBb	0.4*
S1410	Acid	1		no hits	1
21		2		no hits - may be DEP	1
11 -					25
!	B/N	1	0.8600	4-methyl-3-penten-2-one	25
		2		diacetone alcohol (no l.s.)	NQ 19
		3	0.8607	4-ethylresoreinol	5
		4 5		no hits no hits	9
		5		no hits (triacetone alcohol)	60
		7		no hits	4
		8	0.9798	DEP	1.9*
		U	0.9789	propylphthalate	
		9		no hits	6
		10		no hits	6
		11 .	0.9797	methyl ll-(2,3-dideuteiocyclopentan-l-yl)undecanoate	
		12		no hits	2
		13		no hits	6
		14	0.9805	l-dodecanol	
			0.9799	<pre>sethyl ll-(2,3-dideuterocyclopentan-l-yl)undecanoate</pre>	
			0.9788	hexadecanol	,
	•		0.9794	l-(ethenyloxy)-octadecanol	6
			0.8739	l-eicosinel	64
		15	0.9725	4-bromobuty1benzene 2-hydroxy-6-methy1-4-(pheny1metroxy)benzaldehyde	04
		16	<b>0.</b> 9705	no hits	39
		16		ho hits	16
		17		ho mus hBP	0.4*
		-		1/2/1	

•

		Peak	Similarity		(-)
Site	Fraction	No.	Index	Identity	Concentration (a)
S1411	Acid	1	0.9821 0.9786	DEP	(cannot quantitate any of these peaks because
		2	0.9613	propyl phthalate 2,4-DNT	on total ion profile,
			0.9811	2,5-DNT	D-10 peak is lost in a
		3	0.9847	DBP	larger, contaminating
		4	0.9792	2-penty1-1-heptene	peak)
			0.8677	tridecanol	
			0.8639	2-(dodecyloxy)ethanol	
			0.6575	undecanedoic acid	
			0.8640	tetradecanol	
		5	0.9789	D <sub>10</sub> -anthracene (plus some other unidentified cpd.)	
		6		no hits	
		7	0.9825	DBP	
			0.8581	isobutyl phthalate	-
		8	0.9788	tridecanol	
			0.9783	nonanol	
			0.9683	2-methy1-1-dodecanol	
			0.8646	l-cyclopentylhereicosane	
		_	0.8748	octanol	
		9	0.9816	o-nitrodiphenylamine	
			0.9806	m-nitrodiphenylamine	
			0.9729	2-nitro-N-nitroso-N-phenylobenzenamine	
	B/N	1	0.9785	diacetone alcohol	NQ
		2		no hits	2
		3	0.9517	2,6-DNT	12*
			0.9788	o-nitrosobenzaldehyde	
	,	4	0.9815	2,4-DNT	118*
			0.9813	2,5-DNT	
			0.8518	2-ethyl-1,3-dimethylbenzene	
		5		DEP (no 1.s.)	295*
		6		diphenylamine (no l.s.)	35*
		7	0.8501	N,N-dimethylaniline	34
		8		DBP (no 1.s.)	389*
		9		no hits	6
		10	0.9815	o-nitrodiphenylamino	45
			0.9798	2-nitro-N-nitroso-N-phenylbenzenamine	
			0.8579	m-nitrodiphenylamine	_
		11		no hits	4
		12 .	0.8686	2H-cyclopropa[3,4]naphth[1,2-b]oxirene	8
			0.8630	tridecanol	
		13		no hits (phthalate)	4
		14	0.8521	3-methy1-2-propy1-1-pentano1	32
		15		no hits	4
		16		no hits	12
		17		BEHP (no 1.s.)	19
		18		no hits	6
		19		no hits	6

٠

NOIES: (.ee last page of table)

.

. .....

.

.

Site	Fraction	Peak No.	Similarity 	Identity	Concentration <sup>(a)</sup>
S1413	Acii	1		no hits	1
		2	0.9815	dimethyl terephthalate	1
			0.9815	dimethyl isophthalate	
			0.9785	dimethyl phthalate	
		3	0.9817	2,6-DNT	3
			0.8701	2,3-DNT	
			0.8725	l-azido-3-nitrobenzene	
			0,8686	2,4-DNT	
			0.8618	3-phenylpropyl nitrite	
		4.	0.9814	2,5-DNT	31
			0.8794	2,4-DNT	- · · ·
		5	0.9786	o-aminobiphenyl	19
			0.9785	diphenylamine	
		6	0.9809	butyl(butoxycarbonyl)methyl phthalate	2 -
			0.9800	DBP	
		7	0.9830	<pre>butyl(butoxycarbonyl)methyl phthalate</pre>	36
			0.9326	DBP	
			0.9788	propyl phthalate	
		8	0.9817	o-nitrodiphenylamine	2
			0.8765	2-nitro-N-nitroso-N-phenylbenzenamine	
			0.8750	phenazine	
	B/N	1	0.9755	diacetone alcohol	1,900
		2	0.5743	2,6-DNT	46*
		3	0,9816	2,4-DNT	697*
			0.9814	2,5-DNT	
		4	0.9810	[1,1'-bipheny1]-2-amine	140
			0.9807	diphenylamine	
			0.8710	1,1-diphenylhydrozine	318*
		5		DBP (no 1.s.)	887*
		6		no hits (2-nitrodiphenylamine)	21
		7	0.8615	5-ethy1-2-methylheptant	63
			0.8663	2D,4D-dimethylheptanol	
			0.8663	2L,4D-dimethylheptanol	
		8		BrHP (no l.s.)	69
S1414	Acid	1		no hits	1
		2	0.8539	DEP	1
	B/1	1		diacetone alcohol (no l.s.)	NQ
	<b>D</b> /0	2		no hits	1
		3		no hits	ī
		4	0,9817	2,6-DNT	35*
		4	0.8690	2,4-DNT	954*
			0,8607	2-phenyl-5-carboxy-2H-1,2,3,4-tetrazoic	
		5	0,9516	2,4-DST	
		,	0.9815	2,5-DNT	
		6	0,4835	biphenylamine	255*
		0	0, 06	p-aminobilheayl	
			0.9794	N,N-diphenylhydrazine	
			0.7773	and apprending they are and	

NOTES: 'Cee I st page of table)

.

1.1

Site	Fraction	Pe <b>ak</b> No.	Similarity Index	Identity	Concentration (a)
S1414	B/N	7 8 9 10 11 12	0.9817	no hits (phthalate) DEP (no l.s.) no l.s spectrum not detailed enough o-nitrodiphenylamine no hits (phthalate) BEHP (no l.s.)	1 520* 1 11 1 7
<b>S141</b> 5	Acid	1 2	0.9817 0.9809 0.9804 0.8653	no hits 2,6-DNT 2,4-DNT 2,3-DNT 1-pheny1-4-carboxy-4,5-dihydro-1H-1,2,3-triazole	1 4
		3	0.8644 0.9797 0.9795 0.8715 0.8699 0.8638	phenylethane-1,2-diol cyclic corborate 2,4-DNT 2,5-DNT diphenylamine o-aminobiphenyl diphenylnitrosamine	36 _
		4	0.8612 0.8541 0.9526 0.9758 0.8611	l,l-diphenylhydrazine l-methyl-2,3-dinitrobenzene DBP propyl phthalate isobutyl phthalate	40
		5	0.9816 0.8812 0.9799	2-nitrodiphenylamine m-nitrodiphenylamine 2-nitro-N-nitroso-N-phenyl bencenamine	1
	B/K	1 2 3 4 5 6 7	0.9791 0.9785 0.9735 0.8703 0.8703 0.8653 0.8653	diacetone alcohol no hits no hits no l.s spectrum not detailed enough no hits no hits 2L,4D-dimethylheptanol dioctyl adipate bis(1-methylpropyl)ester of carbonic acid 2-ethyl-1-hoxenethiol diocryl ether 2D,4D-dimethylheptanol 3-acetylheptan-2-one	NQ 2 1 1 2 1 32
		8 9 *		BEHP (no l.s.) no hits (farnesyl cyanide) DEP DBP	20 1 0.1* 0.1*

NOTES: (Cee last page of table)

# SEDIMENT AND SOIL SAMPLES (Continued)

NOTES: (a) Concentration is reported as µg/g (ppm). Unless marked with as asterisk (\*) the concentration is approximate. It was calculated assuming a response factor equal to that of the internal standard.

\*Concentration was calculated using a calibration standard for this compound.

NQ = Not able to quantitate

DEP = diethylphthalate

CBP = di-n-butylphthalate

BEHP = bis(2-ethylhexyl)phthalate

# RESAMPLED WELLS

•

•

4

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
51113	Acid	1	0.9820 **0.9816 0.9769	butyl(butoxy carbonyl)methylphthalate dibutylphthalate butyl isobutylphthalate	4
	B/N	1		BENP	5*
		Also:		anthracene/phenthrene	<1*
				DEP	<1*
				DLP	3*
S1124	Acid	1	0.9783 **0.9778	phthalate (dibutyl) butyl(butoxy carbonyl)methylphthalate dibutylphthalate	6
			0.9757	butyl,isobutylphthalate	
		_	0.9731	dirsobutylphthalate	
		2	0.9830	dioctylphthalate	9
			**0.9822	bisethylhexylphthalate	
			0.9786	dicyclohexylphthalate	
	B/N	1	0.9799	5-ethyl-5-methyldecane	7
			0.9793	2,2-dimethy1-1-octano1	
			0.9790	heneicosane	
			0.9786	heptadecane	
			0.9786	eicosane	
			0.9786	2,6,10,15-tetramethylheptadecane	
		2		BEHP	33
		3		DBP and hydrocarbon peaks	8
		4		DBP and hydrocarbon peaks	10
		5	0.9796	trans, trans-farnesol	9
			**0.9771	2-trans,6-trans-farnesyl cyanide	
			0.9757	3,7,11,15-tetramethy1-6,10,14-hexadecatrien-1-ol	
			0.9720 0.9708	3-(2-propynyl) cyclohexane	
			0.9700	[1,1'-bicyclopentyl]-1-ol 1-chloro-2-mitrosocyclohexane	
		Also:	0.9700	DEP	<1*
		ALSO:		DBT	2*
				naphthalene	<1*
				anthracene/phenanthrene	<ī*
				-	
S1135/	Acid	1	<b>0.97</b> 95	2H-1-benzopyran-2-one (coumarin)	5
DNR#3			0.8501	benzeneacetonitrile, alpha-ethyl-	
			0.8484	1,2-naphthalenedione,6-hydroxy	
		_	0.8526	4-phenyloxazole-2-D-	â
		2	0.0705	Same as S1124 #1 - DBP	9 6
		3	0.9725	isobornyl acetate	Ø
			0.9719 0.9712	4-forfuryl-2-pentenoic acid-gammalactone 3'-amino-3'+deoxyadenosine	
			0.9695	cyclopentylbromide	
			0.863	2, U-dimethyleng-7-octen-3-one	
			0.001.	zys sizue enjin in social s sue	

NOTES: // e last page of table)

•

# RESAMPLES WELLS (Continued)

4

•

	Site	Fraction	Peak No.	Similarity Index =	Identity	Contentration (a)
	S1135/ DNR#3	Acid	4		Same as Sll24 <b>#2, BEHP</b> pentachlorophenol	6 5
		B/N	1		DBP	4 *
•			2		fluoranthene	~1*
			3		pyrene	~1*
			4	0.9810	n-tridecane	16
				0.9809	5-methyl-5-ethyldecane	
				0.9800	7-ethy1-2-methy1-4-undecano1	
				0.9798	heptadecane	
				0.9796	octadecane	
			5	0.9800	5-methyl-5-ethyldecane	18
				0.9798	(2-ethylhexyl)ether	
				0.9795	n-dodecane	
				0.9794	2,2-dimethyl-l-octanol	
				0.9792	undecane	
			6	0.9802	5-methyl-5-ethyldecane	19
				0.9802	dioctylether	
				0.9798	2,2-dimethyl-l-octanol	
				0.9798	(2-ethylhexyl)ether	
				0.9797	tricosane	
			7		BEHP	14*
			8	0.9798	n-docosane	19
				0.9798	n-tetracosane	
				0.9795	docosane	
				0.9794	fricosane	
				0.9791	heneicosane	15
			9	0.9803	dodecane	15
				0.9799	l-hexadecanol	
				0.9799	docosane	
				0.9797	tricosane	
			• •	0.9795	2,2,4-(2H3)menthylacetate	12
			10	0.9786 0.9772	trans-transfarnesol (+)-3D,7,11,15-tetramethylhexadeca-6-trans,10-trans,	12
					14-trienc-1-ol	
				**0.9762	2-trans,6-trans-farnesyl cyanide	
				0.9725	irone alpha B	
				0.9725	(+)-methyl3D,7,11,15-tetra methylhexadeca-6-trans,10-trans- 14-trienoat	
			11	0.9790	docosane	13
				0.9787	10-methyleicosane	
	_			0.9786	heneicosane	
	•			0.9782	eicosane	
				0.9782	2,6,10,15-tetramethylheptadecane	

ι.

NOTES: (See last page of table)

- -----

# RESAMPLED WELLS

Site	Fraction	Peak ` Nc.	Similarity Index	Identity	Concentration (a)
S1135/ DNR#3	ь <b>/N</b>	12	0.9799 0.9793 0.9790 0.9786 0.9786	5-ethyl-5-methyldecane tricosane heneicosane eicosane 2,6,11-trimethyldodecane	13
		Also:		anthracene/phenanthrene DEP	<1* <1*

NOTES: <sup>(a)</sup>Conventration is µg/1. Unless marked with an asterisk (\*) concentration is approximate. It was calculated asymming a response factor equal to that of the internal standard.

\*Compentration was calculated using calibration standards for this compound. Value is µg/1.

\*\*Mcc\* likely identification.

N<sub>1</sub> = Net able to quantitate.

# FISH SAMPLES FOR GRUEBER'S GROVE BAY

•

3

•

.

Sample No.	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
B0210/80218	B/N and	1		d-10 anthracene, ISTD	
Composite	Acid	2	0.9818	palmitic acid	16
(Walleye)			0.9813	oleic acid	
•			0.9806	dihydroambrettolide	
			0.9804	2L,4L-dihydroxycecosane	
		3	0.9808	9,17-octadecadienal	13
			0.9805	methyl hexadec-ll-ynoate	
			0.9303	1-nonadecene	
			0.9802	octadeca-9,12-dien-1-ol	
		4		no hits	3
		5		BEHP	
		6	0.9804	<pre>**2,trans,6-trans-farmesylcyanide</pre>	1
			0.9783	methyl 3-cis,7-trans-homofarnesate	
			0.9765	6,10,14-hexadecatrien-1-o1,3,7,11,15-tetramethyl	
			0.9765	6,10,14-hexadecatricnole acid,3,7,11,15-tetramethy1,	
			0.9734	methyl ester 13-apitorulosol-lamba-8(17),14-diene-13-beta,19-diol	
		7	0.9741	methyl 13-oxo octadecanoate	11
		,	0.9738	l-H-pyrrolo[2,-1-b][1,3]benzodiazepine,2,3,5,6-	**
				tetrahydro-5(1-4-indol-3-yl)-3-methyl-	
			0.9716	dimethylandrostanolone	
			0.9713	1-benty1-4-benzolsulfonylimeno-1,2,4-triazolium-ylid	
			0.9698	2-(phenylmethoxy)benzenepropanoic acid, methyl ester	
		. 8	0.9701	vimalin	11
		Also:		DEP	0.017*
				DBP	0.140* 0.820*
				BEHP	0.820*
B0216 (Carp)		1	0.9816	pentadecane	0.3
			0.9808	5-methyl-5-ethyldecane	
			0.9790	2-ethyl-l-hexanol	
			0.9787	tetradecane	
			0.9786	2-methylundecane	•
		2	0.9819	heptadecane	3
			0.9812	5-ethy1-5-propylundecane	
			0.9807	dioctyl ether	
			0.9800	7-ethyl-2-methyl-4-undecanol	
		-	0.9798	2,2,4-(2113)-menthylacetate	0.3
		3	0.9790	(2-ethylhexyl)ether	0.3
			0.9779	tetradecane	
			0.9779	pentadecane	
			0.9764	2-bromo octane	
•			0.9740	5-methyl octadecane	

NOTES: (See last page of table)

.

•

# FISH SAMPLES FROM GRUEBER'S GROVE BAY (Continued)

4

.

.....

<b>a</b> . <b>1</b>		Peak	Similarity		(a)
Sample No.	Fraction	No.	Index	Identity	Concentration
B0216 (Carp)		4	0.9800	tetracosane	1 .
			0.9797	tricosane	
			0.9798	$C_{22}H_{46}$ standard	
			0.9792	2,6,10,14-tetramethyl hexadecane (phytane)	
			0.9770	10-methyleicosane	
		5		$d_{10}$ ~anthracene (ISTD)	
		6	0.9818	palmitic acid	16
			0.9813	oleic acid	
			0.9806	dihydroambrettolide	
			0.9304	2L,4L-dihydroxycecosane	
		7	0.9808	9,17-octadecadienol	13
			0.9805	methyl hexdec-ll-ynoate	
			0.9803	1-nonadecene	
			0.9802	octadeca-9,12-dien-1-ol	
		8	0.9718	methyl 5,8-octadecadienoate	6
			0.8651	methyl-11,14,17-locosatrienoate	
			0.8530	methyl linoleate	
		9	0,9804	<pre>**2,trans,6-trans-farmesyl cyanide</pre>	3
			0.9783	methyl 3-cis,7-trans-homofarnesate	
			0.9765	6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl	
			0.9765	<pre>6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester</pre>	
			0.9734	13-epitorulosol-lamba-8(17),14-diene-13 beta,19-diol	
		10	0.9741	methyl 13-oxo octadecanoate	11
			0.9738	1-H-Pyrrolo[2,-1-b][1,3]benzodiazepine,2,3,5,6-tetrahydro- 5(1-4-indol-3-y1)-3-methyl-	
			0.9716	dimethylandrostanolone	
			0.9713	1-benty1-4-benzolsulfonylimeno-1,2,4-triazolium-ylid	
			0.9698	2-(phenylmethoxy)benzenepropanoic acid, methyl ester	
		11	0.9701	vimalin	11
		Also:		DEP	0.017*
				DBP	0.140*
				ВЕНР	0.820*
		12	0.9752	hexacosanol-l	1
			0.9734	heptacosanol-1	
			0.9732	3-ethy1-5-(2-ethy1buty1)octadecane	
			0.9730	tetracosanol	
			0.9730	lanost-9(11)-en-12-one	
		Also:		pentachlorophenol	1.13* ·
				naphthalene	0.055*
				DEP	0.027*
				DBP	0.12*
				BEHP	0.15*
				anthracene/phenanthrene	0.027*

NOTES: (See list page of table)

.

# FISH SAMPLES FOR GRUEBER'S GROVE BAY (Continued)

. · ·

.

,

Instruct         Instruct         Instruct         Instruct           D205/S01C         1         d=10 anthraceme (ISTD)         010 instruct         15           D205/S01C         2         0.9818 galnitic acid         15         15           (Vellow         0.9804 21,41-dihydroxyceosane         7         7           0.9804 21,41-dihydroxyceosane         7         7         7           0.9803 21-oradocadienal         7         7         7           0.9803 20 cetadeca-9,12-dinel-lool         7         7         7           0.9703 trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         1         1           0.9703 methyl policite         0.9773 methyl policite         1         1           0.9773 methyl policite         0.9773 methyl policite         1         1           0.9773 methyl policite         0.9783 methyl stower 0.85 similarity         1         1           1         0.9763 methyl vigit crephthalate         0.9783 methyl sover 0.85         1         1           0.9783 methyl	Sample No.	Fraction	Peak No.	Similarity Index	Identity	Concentration (a)
Ccruption         2         0.9818         mainifie soid         15           (Yellow         0.9813         oloic acid         15           perch)         0.9804         2L,4L-dihydroxupertolide         7           0.9804         2L,4L-dihydroxupertolide         7           0.9804         2L,4L-dihydroxupertolide         7           0.9805         rethyl hexadec-ll-ynoate         7           0.9802         cctadeca-9,12-dien-1-ol         7           0.9803         trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         <1					1 denez of	<u>concentration</u>
(Yellex       0.931       Oleic acid         perch)       0.9303       Oleic acid         3       0.9303       9,17-octadocadienal       7         0.9303       9,17-octadocadienal       7         0.9303       9,17-octadocadienal       7         0.9303       0.917       Trans-2,2-bis(strifluoromethyl)-4-ethyl-5-octyl-       <1						
perch)         0.906         disydrometolide           0.9804         22.4L-dihydroxycecosane         7           0.9805         9.17-octaducadienal         7           0.9806         9.17-octaducadienal         7           0.9806         1-nonadecene         7           0.9802         cotadeca-9.12-dien-1-ol         4           1.3-dioxilane         (trans) (probably not)         4           1.3-dioxilane         (trans) (probably not)         4           0.9773         methyl patioleate         0.9773           0.9773         methyl patioleate         0.9773           0.9771         DNF (wrong retention time)         1           0.9698         methyl viryl terephthalate         1           0.9765         6.10.14-hexadecatrienole acid, 3.7.11.15-tetramethyl         1           0.9765         6.10.14-hexadecatrienole acid, 3.7.11.15-tetramethyl, methyl ester         1           0.9765         6.10.14-hexadecatrienole acid, 3.7.11.15-tetramethyl, methyl ester </td <td></td> <td></td> <td>2</td> <td></td> <td></td> <td>15</td>			2			15
0.9804       21,41-dihydroxycecosane       7         1       0.9808       9,17-octadocadienal       7         0.9804       21,70-octadocadienal       7         0.9805       rethyl hexadec-11-ynoate       7         0.9805       rethyl hexadec-21-ynoate       7         0.9804       Cotadeca-9,12-dien-1-ol       1         4       0.9783       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-       (1         1,3-dioxClane       (trans)       (probably not)       (1)         0.9779       methyl oleate       0.9779       (trons)       (trons)         0.9779       methyl palmitoleate       0.9774       (trons)       (1)         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl       1         0.9760       2(1H)-anphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl       1         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl       1         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl       1         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl       1         0.9761       mohits over 0.85       1       1         0.9763       methyl vitrephthalate       1       1         0.9783						
3       0.9008       9,17-octahoradienal       7         0.9002       nonadscene       7         0.9002       cctadeca-9,12-dien-1-ol       1         4       0.9703       trans-2,2-bis (trifluoromethyl)-4-ethyl-5-octyl-       1         1,3-dioxclane (trans) (probably not)       1,3-dioxclane (trans) (probably not)       1         0.9774       citronellyl propionate       7         0.9775       methyl painitoleate       1         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl ethyl (is,4a,5a,8a))       1         6       DEHP       1         7       0.9717       DNP (wrong retention time)       4         0.9698       methyl vinyl terephthalate       1         0.9698       methyl 3-cis, 7-trans-homofarmesate       1         0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl       1         0.9763       nethyl 3-cis, 7-trans-homofarmesate       1         0.9764       **2,trans,6-trans-farmesyl cyanide       1         0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl, methyl ether       1         0.9764       methyl 3-cis, 7-trans-homofarmesate       1         0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl, methyl isoxo octadecanoate       1	perch)					
0.9205       rethyl hexadec-ll-ynoate         0.9202       cctadeca-9,12-dien-1-ol         4       0.9783       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         1.9793       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         0.9773       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         0.9774       citronellyl propionate         0.9775       methyl poleate         0.9776       citronellyl propionate         0.9776       2(lli)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl         0.9760       2(lli)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl         0.9761       no hits over 0.85 similarity       1         0.9698       methyl vinyl terepthalate       0         0.9763       rethyl 3-cis,7-trans-farnesyl cyanide			-			_
6.9803       1-nonadecene         0.9802       cctadeca.9,12-dien-1-ol         4       0.9783       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-         1,3-dioxlane       (trans) (probably not)         0.9779       methyl oleate         0.9773       methyl palmitoleate         0.9773       methyl palmitoleate         0.9773       methyl palmitoleate         0.9774       citronellyl propionate         0.9775       methyl palmitoleate         0.9776       notis over 0.85 similarity         1       PEHP         7       0.9717         0.9698       methyl vinyl terephthalate         0.9698       1,2-di-p-tolylethane         0.9763       methyl ackcatrienole acid, 3,7,11,15-tetramethyl         0.9764       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9741       methyl andros otadecanoate         0.9716       0.9713       1-berzyl-4-tenzolsulfonylimeno-1,2,4-triazolium-ylid			3			7
0.9802       cctadeca-9,12-dien-1-ol       <1						
4       0.9783       trans-2,2-bis(trifluoromethyl)-4-ethyl-5-octyl-						
1,3-dioxclane (trans) (probably not)         0.9779       methyl oleate         0.9774       citroncllyl propionate         0.9773       methyl palmitoleate         0.9773       methyl palmitoleate         0.9774       citroncllyl propionate         0.9775       methyl palmitoleate         0.9776       cithyl, (3u, 4u, 5u, 8u, au)         5       no hits over 0.85 similarity         6       DEHP         7       0.9717         0.9638       methyl vinyl terephthalate         0.9638       methyl acis,7-trans-homofarnesate         0.9763       methyl acis,7-trans-homofarnesate         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl,         methyl ester       0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9731       methyl 3-oxo octadecanoate       15         0.9716       dimethyl androstanolone       15         0.9716       dimethylandrostanolone       0.9713						
0.9774       citronellyl propionate         0.9773       methyl palmitoleate         0.9773       methyl palmitoleate         0.9760       2(1H) -naphthalenone, octahydro-4α,5-dimethyl-3-(1-methyl         ethyl)(3u,4u,5u,8au)       1         5       no hits over 0.85 similarity         6       EHP         7       0.9717         0.9698       methyl vinyl terephthalate         0.9698       1,2-di-p-tolylethane         only hits over 0.85       1         8       0.9604       **2,trans,6-trans-farnesyl cyanide         0.9783       methyl 3-cis,7-trans-homofarnesate         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl,         methyl ester       0.9734         9       0.9731         0.9738       13-epitorulosol-lamba-8(17,),14-diene=13 beta, 19-diol         9       0.9734       13-epitorulosol-lamba-8(17,),14-diene=13 beta, 19-diol         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-         tetrahydro-5(1-4-indo1-3-y1)-3-methy1-       0.9716         dimethyl androstanolone       0.9713         0.9713       1-benzyl-4-tenzolsulfonylimeno-1,2,4-triazolium-ylid			4			<1
0.9773       methyl palmitoleate         0.9760       2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl         ethyl) (3u,4a,5a,8aa)       no hits over 0.85 similarity         1       1         6       EEHP         7       0.9717         DNP (wrong retention time)       <1						
0.9760       2(1H) -naphthalenone, octahydro-4α,5-dimethyl-3-(1-methyl         ethyl) (3a,4a,5a,8aa)       1         5       no hits over 0.85 similarity       1         6       DEHP       1         7       0.9717       DMP (wrong retention time)       <1				0.9774	citronellyl propionate	
i       i         5       no hits over 0.85 similarity       1         6       DEHP       1         7       0.9717       DMP (wrong retention time)       <1					methyl palmitoleate	
5       no hits over 0.85 similarity       1         6       DEHP       1         7       0.9717       DMP (wrong retention time)       <1				0.9760	2(1H)-naphthalenone, octahydro-4a,5-dimethyl-3-(1-methyl	
6       DEHP       1         7       0.9717       DMP (wrong retention time)       <1					ethyl) $(3\alpha, 4\alpha, 5\alpha, 8a\alpha)$	
7       0.9717       DNP (wrong retention time)       <1					no hits over 0.85 similarity	
0.9698       methyl vinyl terephthalate         0.9698       1,2-di-p-tolylethane         only hits over 0.85       0.9804         **2,trans,6-trans-farnesyl cyanide       1         0.9783       methyl 3-cis,7-trans-homofarnesate         0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl,         methyl ester       0.9734         13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9711         14-heyyrolc[2,1-1-b][1,3]benzodiazepine,2,3,5,6-         15         0.9716         0.9713         1-kepyrolc[2,1-4-benzolsulfonylimeno-1,2,4-triazolium-ylid					BEHP	
0.9698       1,2-di-p-tolylethane only hits over 0.85       1         8       0.9804       **2,trans,6-trans-farnesyl cyanide 0.9783       1         0.9783       methyl 3-cis,7-trans-homofarnesate 0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl 0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol       15         9       0.9741       methyl 13-oxo octadecanoate 0.9738       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl-       15         0.9716       dimethylandrostanolone 0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid			7			<1
only hits over 0.85       1         8       0.9804       **2,trans,6-trans-farnesyl cyanide       1         0.9783       methyl 3-cis,7-trans-homofarnesate       1         0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl       0.9765         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester       1         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol       15         9       0.9741       methyl 13-oxo octadecanoate       15         0.9738       1-H-pyrrolc[2,1-1-b][1,3]benzodiazepine,2,3,5,6-       tetrahydro-5(1-4-indol-3-yl)-3-methyl-         0.9716       dimethylandrostanolone       0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid					methyl vinyl terephthalate	
8       0.9804       **2,trans,6-trans-farnesyl cyanide       1         0.9783       methyl 3-cis,7-trans-homofarnesate       1         0.9765       6,10,14-hexadecatrien-1-c01,3,7,11,15-tetramethyl       0.9765         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl,       methyl ester         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol       15         9       0.9741       methyl 13-oxo octadecanoate       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-       tetrahydro-5(1-4-indol-3-yl)-3-methyl-         0.9716       dimethylandrostanolone       0.9713         0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid				0.9698		
0.9783 methyl 3-cis,7-trans-homofarnesate 0.9765 6,10,14-hexadecatrien-1-o1,3,7,11,15-tetramethyl 0.9765 6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester 0.9734 13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol 9 0.9741 methyl 13-oxo octadecanoate 15 0.9738 1-R-pyrrolc[2,1-1-b][1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl- 0.9716 dimethylandrostanolone 0.9713 1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid						_
0.9765       6,10,14-hexadecatrien-1-ol,3,7,11,15-tetramethyl         0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9741         methyl 13-oxo octadecanoate       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl-         0.9716       dimethylandrostanolone         0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid			8			1
0.9765       6,10,14-hexadecatrienole acid, 3,7,11,15-tetramethyl, methyl ester         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9741       methyl 13-oxo octadecanoate       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl-       15         0.9716       dimethylandrostanolone       0.9713         0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid					methyl 3-cis,7-trans-homofarnesate	
methyl ester         0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9741       methyl 13-oxo octadecanoate       15         9       0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-       15         0.9716       dimethylandrostanolone       0.9713         0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid						
0.9734       13-epitorulosol-lamba-8(17,),14-diene-13 beta, 19-diol         9       0.9741       methyl 13-oxo octadecanoate       15         9       0.9741       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-       15         0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6-       16         0.9716       dimethylandrostanolone       0.9713         0.9713       1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid				0.9765		
9         0.9741         methyl 13-oxo octadecanoate         15           0.9738         1-R-pyrolc[2,1-1-b][1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl-         15           0.9716         0.9716         dimethylandrostanolone           0.9713         1-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid						
0.9738       1-H-pyrrolc(2,1-1-b)[1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indo1-3-y1)-3-methy1-         0.9716       dimethylandrostanolone         0.9713       1-benzy1-4-benzolsulfonylimeno-1,2,4-triazolium-ylid						
tetrahydro-5(1-4-indol-3-y1)-3-methyl- 0.9716 dimethylandrostanolone 0.9713 l-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid			9			15
0.9713 l-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid				0.9738		
				0.9716	dimethylandrostanolone	
0.9698 2-(phenylmethoxy)benzenepropanoic acid, methyl ester				0.9713	l-benzyl-4-benzolsulfonylimeno-1,2,4-triazolium-ylid	
				0.9698	2-(phenylmethoxy)benzenepropanoic acid, methyl ester	
0.9701 vimalin 11				0.9701	vimalin	
Also: DEP 0.017*			Also:		DEP	
DBP 0.140*					DBP	
BCHP 0.820*					BCHP	0.820*
10 0.9752 hexacosanol-1 1			10	0.9752	hexacosanol-l	1
0.9734 heptacosanol-1				0.9734	heptacosanol-1	
0.9732 3-ethyl-5-(2-ethylbutyl)octadecane				0.9732	3-ethyl-5-(2-ethylbutyl)octadecane	
0.9730 tetracosanol				0.9730	tetracosanol	
0.9730 lanost-9(11)-en-12-one				0.9730		
Also: DEP 0.020*			Also:			
DBP 0.15*						
BEHP 1.8*					BEHP	
fluoranthene 0.067*					fluoranthene	
pyrene 0.066*						
anthracene/phenanthrene 0.15*					anthracene/phenanthrene	0.15*

NOTES: (See last page of table)

# FISH SAMPLES FOR GRUEBER'S GROVE BAY (Continued)

Sample 12.	Fraction	Peak No.	Similarity Index	Identity	(a)
Dumpite	<u>r rac cron</u>	<u></u>	Index		Concentration (C) Calculations made using same dilution
Blank		1		d <sub>10</sub> -anthracene (ISTD)	factor as fish)
		2		BEHP	0.13*
		3	0.9804	<pre>**2, trans, 6-trans-farmesylcyanide</pre>	0.12
			0.9783	methyl 3-cis,7-trans-homofarnesate	
			0.9765	6,10,14-hexadecatrien-1-p1,3,7,11,15-tetramethy	
			0.9765	6,10,14-hexadecatrienole acid,3,7,11,15-tetrame methyl ester	thyl,
			0.9734	13-epitorulosol-lamba-8(17),14-diene-13-beta,19	-diol
		4	0.9741	methyl 13-oxo octadecanoate	0.52
			0.9738	1-H-pyrrolo[2,-1-b][1,3]benzodiazepine,2,3,5,6- tetrahydro-5(1-4-indol-3-yl)-3-methyl-	
			0.9716	dimethylandrostanolone	
			0.9713	1-benty1-4-benzolsulfonylineno-1,2,4-triazolium	
			0.9798	2-(phenylmethoxy)benzenepropanoic acid, methyl	ester
			0.9701	vimalin	
		Also:		DEP	0.010*
				DBP	0.066*
				BBP	0.030*

NOTES: <sup>(a)</sup>Concentrations are µg/g (ppm). Unless marked with an asterisk (\*) the concentration is approximate. It was calculated assuming a response factor equal to that of the internal standard and calculated by peak height.

\*Concentration calculated against a calibration standard for this compound. Values are µg/g.

\*\*Most probable identification.

NQ = Not able to quantitate.

no l.s. = No library search needed to identify compound.

DBP = di-n-butyl phthalate

DEP = diethyl phthalate

BEHP = bis(2+ethylhexyl)phthalate

BBF = butylbenzyl phthalate

· · (

# SURFACE WATER

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a) (b)
\$1301	VOA	1 2	0.9756 0.9783 0.9733 0.9733	dichloromethane tetrahydrofuran 2-methoxy-1-propane 2,2-dimethyloxirane	12 21
	Acid	1		BEHP	10
	B/N	1 2 3 4 5		no hits no hits no hits (DEP) no hits (DBP) BEHP	12 15 85
		6 7 *		no hits (farnesyl cyanide) no hits DEF DBP	8 10 6 3
S1307	\′O <b>A</b>	1 2	0.9735 0.9760 0.9736 0.9736 0.9735	dichloromethane pentane 1-chloro-2-methylpropane (isobutyl chloride) 3-methyl-2-pentanone 1-hexyn-3-ol	13 13
	Acid	1 2		no hits BENP	1 2
	B/N	1 2	0.9206 0.8729 0.8693 0.8644 0.8659	no hits 2-mathyl-1-dodecanol 1-octadecanol nomadecanol decanol 3-methyl-2,6-dioxo-4-hexenoic acid	<1 <1
		3 4 5		DAP BEPP no hits	NQ <1

NOTES: (a) Concentration for water samples is pg/1.

(b) Only DEP, DEP and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

IDTD - Internal standard

٩

N. - Not able to quantitate

FIDE lis(2-ethy)hexy1) phths1 ste

COP - S Hethylphthalate

lop = di-n-butwlphthalate

# SURFACE WATER

•

.

_		Peak	Similarity		(a) (b)
Site	Frantion	No.	Index	<u>ldentity</u>	Concentration <sup>(a)</sup> (b)
S1307	B/N	6	0.8745	2-hydroxy-4-isopropyl-1-methylbenzene	<1
			0.8745	thymol	
			0.8644	methyl a-ketomyristate	
		*		DEP	2
		*		DBP	1
S1312	VOA	1	0.9756	dichloromethane	14
		2	0.9810	chloroform	11
		3	0.9758	pentane	12
			0.9734	isobutyl chloride	
			0.9711	3-methy1-2-pentanone	
	Acid	1		no hits	41
		1 2	0.9803	n-buty1-2-ethy1-o-phthalate	6
		3	<b>0.9</b> 79 <b>7</b>	DBP	16
			0.8592	n-butyl-2-ethyl-o-phthalate	
		4	0.8646	DBP	23
		5		no hits - probably a phthalate	21
		6		no hits - probably a phthalate	12
		7		BEHP	19
	B/N	1 2		no hits	6
				no hits	4
		3	<b>0.9</b> 803	dodecanol-1	7
			0.9788	citrenellyl propianate	
			0.9787	hexadecanol	
			0.9785	hexadecanol	
			0.9764	1,12-tridecadiene	
		4		DEHP (no l.s.)	16
		*		DIP	1
		*		DBP	<1
S1314	VOA	1	0.9753	dichloromethane	71

NOTES: Concentration for within the second

2. No. C. DEL, DED and connect contracts on constraint standards of these conneands. Other quantitations are approximate of a constraint constraint of constraints were no survey from the fotal constraint and performmentation of constraints. A constraint constraints were no survey from the fotal constraint and performmentation of constraints. A constraint constraints were no survey from the fotal constraint and constraints.

- 1 ... internal stammark
- b. Not after the quarters:
- Press 1125-14-6 to transfer outers
- det diethuittea

•

.

197 - ui-n-butvlphth late

#### CUPEACE WATER Continued

Site	<u>ir</u>	Peak No.	312	Information	Concentration <sup>(a)</sup> (b)
<b>S1</b> 314	VOA	2	0.9784 0.9759 0.9736	pentane l-hexyn-3-ol isobutyl chloride	12
	Acid	1 2		no hits BEHP	2 3
	B/!:	1 * *		BFHP Ditp DBP	34 <1 <1

ار در در در منهم در در از مر<del>ور در د</del>رد.

•

•

.

the state of the state Re-

and the second 
internet internet internet

.

# GROUND WATER

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a) (b)
S1102	VOA	1		no hits - air peak	15
		2		no hits	4
		3		no hits - perhaps chloroform	2 2 11
		4		no hits	2
		5	<b>0.9</b> 760	pentane	11
			0.9735	l-hexyn-3-ol	
	Acid	1		BEHP	6
	B/N	1		BTHP	29
		*		DEP	<1
		*		DEP	<1
S1104	AOV	1		no hits - air peak	10
		2	0.9785	furon, tetrahydro-	10
			0.9758	oxirane,2,2-dimethyl	
		3		ro hits - perhaps freon	2
		4		no hits	5
		5	0.9715	pestane	13
			0.9738	pentane	
	Acid	1		5 FilP	6
	в/::	1		BEHP	96
		*		DIP	1
S1107	VOA	1		no hits + probably methylene chloride	19
		2		ne hits - probably tetrahydrofuran	10
		3	0.9506	pentane	11
	Acil			no peaks other than ISTD	

NOTES: (a) contration for water samples is  $(1, Mg^{f_{cont}}, f_{cont}, f_{cont})$ 

(b) Only DEP, DBC and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

- ISTL Internal standard
- SERVICE His (2-ethylhexyl) plates lite
- 18P Hiethyl, hthalate
- BP li-n-hotylphthalite

.

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a) (b)
				······································	
S1107	B/N	1		no hits	7
		2 3	0.9815	BEHP	110
		2	0.8666	2-r,6-t-farnesyl cyanide 2,6-dimethylene-7-octen-3-one	8
			0.8647	geranyl formate	
			0.8657	2,6,10-dodecatrien-1-ol,3,7,11-trimethy1-	
			0.8571	trans, trans-farnesol	
			0.8565	farnesol	
		*		DEP	8
		*		DBI	<1
S1108	VOA	1	0.9713	methylene chloride	10
		2	0.9690	1,1'-oxybisethane	14
			<b>0.96</b> 90	ethyl ether	
			0.9690	diethyl ether	
	Acid			no peaks other than ISTD	
	E/N	1		BEHP	31
		2		no hits	3 1
		*		dithenylamine	1
		*		DEL	<1
		*		DBb	<1
S1109	VOA	1	0.9737	methylene chloride	11
	Acid			no peaks other than ISTD	
	BIN	1	0.9804	2-methylcyclopentanone	6
			0.9802	cyclohexanone	
			0.9773	3-hexene	
			0,9772	2-hexene	
		2	0.8740	5-wethyl-2-oxo-2,3-dihydrofuran	71
		2 *		BFifP (no l.s.)	<1
				DI.P DBF	<1
				ועט	` <b>▲</b>

NOTES: (a) Concentration for water samples is ag/1.

(b) Only DEP, DBP and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

1970 - Esternal standard

- 12 S Not able to quantitate
- Family (2-ethylhexyl) phthelate
- 199 Siethylphthalate
- FEP = di-n-butylphthalate

31111       Y07:       1       0.9756       r.thylene chloride (dichloromethane)       21         2       0.5756       1.2.etimethyle xirane       15         1       0.5756       1.2.etimethyle xirane       16         0.5756       1.2.etimethyle xirane       16         0.5756       1.2.etimylene xide       16         0.5756       1.2.etimylene xide       13         Aci:       51112       0.9582       2.0.5976         8/::       1       0.9582       2.0.5976         0.9765       1.100000000000000000000000000000000000	<u>Site</u>	Francion	Pe <b>ak</b> No.	Similarity Index	Identity	Concentration (a) (b)
0.9733         Ukrahydofuran         1           0.9776         1,2-epoxy-2-methylprorpane         16           0.9776         2,3-pentanetione         16           0.9776         2,3-pentanetione         16           0.9776         2,3-pentanetione         13           0.9776         4         0.9776           0.9776         4         0.9776           0.9776         1-licxyn-3-ol         13           Aci::         BHP         3           B/::         1         0.9838         diortylphthalate         10           D:8         0.9833         BHP         3         1           B/::         1         0.9838         diortylphthalate         10           D:8         0.9833         BHP         3         1           S1112         V07.         1         mo hits - probably methylene chloride         16           0.9733         2-ingroanone (acetone)         40         16         16           0.9733         2-ingroanone (acetone)         40         17         180           0.9733         2-ingroanone (acetone)         40         180         180           0.9734         1.2-ingroanone         27	31111	VC.	1	0.9756	rethylene chloride (dichloromethane)	21
0.97:6       isobutylene oxide         3       0.97:6       1.2-pepsy-2-methylprorpane         3       0.97:6       2.1-pepsy-2-methylprorpane         4       0.97:6       2.1-pentanedine         0.97:6       2.1-pentanedine       13         0.97:6       2.1-pentanedine       13         0.97:6       2.1-pentane       13         0.97:6       1-lexyn-3-ol       13         Aci:1       D.9785       1-lexyn-3-ol         8/:1       1       0.9638       dioctylphthalate       10         0.9785       1-lexyn-3-ol       1       1       10         8/:1       1       0.9638       ERP       3       1         0.9833       ERP       1       10       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <td></td> <td></td> <td>2</td> <td></td> <td></td> <td>15</td>			2			15
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
3       0.5466       2-butnome       16         6.7752       2.1-pentametione       13         6.7759       proposil, 2-methyl-       13         0.9756       2-butne       13         4       0.9766       2-butne         0.9755       1-hoxyn-3-ol       13         Aci:1       BHP       3         B/N       1       0.9638       dioctylphthalate       10         D.9       0.9833       PNP       3       3         S1112       V07.       1       no hits - probably methylene chloride       16         0.9763       2-bydrow-2-methylpropanenitrile       16       3         S1112       V07.       1       no hits - probably methylene chloride       16         0.9763       2-bydrow-2-methylpropanenitrile       16       3         0.9776       2-methyl-2-propanane       16       3         0.9778       2-methyle-2-propanane       16       3         0.9774       t-trandorfuran       180       3         0.9774       -proponome (acetone)       180       3         0.9773       d-methyldiazene       27       27         0.9773       d-methyldiazene       27       <						
0.9722       2,3-pentamedione         0.9712       2,3-pentamedione         0.9716       C-penten-2-one         0.9716       C-petto acid ethenyl ester         4       0.9785         1       0.9785         Aciri       BHMP         8/%       1         0.9838       Bitsp         8/%       1         0.9838       Bitsp         3       0.9838         51112       VO/.         1       0.9807         2-hydroxy-2-methylpropanenitrile         0.9783       D.P         51112       VO/.         1       no hits - probably methylene chloride         2       0.9807         2-hydroxy-2-methylpropanenitrile         0.9783       D.P         0.9783       D.P         0.9783       D.P         1       no hits - propanamine         0.9783       D.Perethyl kotone         0.9783       D.Perethyl kotone         0.9784       tottanydrofuran         0.9785       r-methyl-Peropanamine         0.9784       tottanydrofuran         0.9783       remethyletone         0.9784       tottanydrofur						
Aci:       BTHP       3         Aci:       BTHP       3         B/::       1       0.9838       dioctylphthalate       10         B/::       1       0.9838       dioctylphthalate       10         B/::       1       0.9838       Bick       10         B/::       1       0.9838       Bick       10         Silli2       VO:       1       no hits - probably methylene chloride       16         Silli2       VO:       1       no hits - probably methylene chloride       16         2       0.9763       2-propanone (acetone)       40       40         0.9776       2-hydroxy-2-methylpropanenitrile       180       180         0.9776       2-mothyliczene       27       27       190         0.9776       2-methyliczene       27       27       27         0.9776       2-methyliczene       27       27       27         0.9773       2-methyliczene       27			3			16
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
Acid       B(HP)       3         B/::       1       0.9838       dioctylphthalate       10         B/::       1       0.9838       B(HP)       3         B/::       1       0.9838       B(HP)       3         S1112       V07.       1       no hits - probably methylene chloride       16         S1112       V07.       1       no hits - probably methylene chloride       16         0.9783       2-propanone (acetone)       40       40         0.9783       2-propanone (acetone)       40         0.9778       2-methyl-2-propanamine       27         3       0.9784       tutane       27         0.9778       2-methyl-2-propanamine       27         3       0.9784       tutane/unpropinol       27         0.9778       2-methyl-2-propanamine       27         0.9778       2-methyl-2-propanamine       27         0.9778       2-methyl-2-propanamine       27         0.9777       2-methyl-2-propanamine       180         0.9778       2-methyl-2-propanamine       180         0.9777       2-methyl-2-propanamine       180         0.9733       methylefouran       180         <						
Acid       BTHP       3 $B/3$ 1       0.9633 $B^{CHP}$ 10 $*$ 0.9833 $B^{CHP}$ 3 $*$ 0.973 $B^{CHP}$ 3 $*$ 0.970 $B^{CHP}$ 3 $*$ 0.9807 $2^{-hydroxy-2-methyleropanenitrile}$ 16 $0.9733$ $2^{-propanone}$ (acetone)       40 $0.9763$ $D_{CP}$ 40 $0.9763$ $D_{CP}$ 40 $0.9763$ $D_{CP}$ 40 $0.9763$ $D_{CP}$ 40 $0.9778$ $2^{-methyl-2-propanone}$ 180 $0.9778$ $2^{-methyl-2-propanaline}$ 180 $0.9771$ $-proponol (acetone)$ 17 $0.9771$ $-proponol (acetone)$ 27 $0.9773$ $2^{-methyl-2-propanaline}$ 27 $0.9771$ $-proponol$ 27 $0.9773$ $2^{-propanol}$ 180 $0.9773$ $2^{-propanol}$ 13 $0.9773$ $acetic acid (thenyl ether nologic acid (thenyl ether nologic acid (thenyl ether nologic acid (thenyl ether nologic acid (thenyl ethe$			4			13
B/::       1       0.9838       Bill bill       10         *       D.9       3       3         *       D.9       3         *       D.97       2-hydroxy-2-methylpropanenitrile       16         0.9753       2-propanone (accetone)       40       40         0.9763       D-1       2-methylizene       40         0.9776       2-methylizene       27       27         0.9774       tetrahydrofuran       180       27         0.9773       tetrahydrofuran       27       27         0.9773       tetrahylpropanol       27       27         0.9733       4-pentene-2-one       0.9733       3				0.9/80	i-nexyn-3-01	
*     0.9833     phip       *     b.3     3       \$     *     b.3       \$     *     b.3       \$     *     b.3       \$     0.9763     2-hydroxy-2-methylpropanenitrile       \$     0.9763     2-propanone (acetone)       \$     0.9763     2-propanone (acetone)       \$     0.9776     2-methyler2-propanamine       \$     0.9776     2-methyler2-propanamine       \$     0.9776     2-methyler0       \$     0.9776     2-methyler0       \$     0.9776     2-methyler0       \$     0.9771     -mothyler0       \$     0.9773     acetic acid       \$     0.9773     acetic acid       \$     0.9773     acetic acid ethenyl ether       \$     no hits     13		Acid			BCHP	3
*     0.9833     phip       *     b.3     3       \$     *     b.3       \$     *     b.3       \$     *     b.3       \$     0.9763     2-hydroxy-2-methylpropanenitrile       \$     0.9763     2-propanone (acetone)       \$     0.9763     2-propanone (acetone)       \$     0.9776     2-methyler2-propanamine       \$     0.9776     2-methyler2-propanamine       \$     0.9776     2-methyler0       \$     0.9776     2-methyler0       \$     0.9776     2-methyler0       \$     0.9771     -mothyler0       \$     0.9773     acetic acid       \$     0.9773     acetic acid       \$     0.9773     acetic acid ethenyl ether       \$     no hits     13		p ///	,	0 0 6 3 0	dianty lob the late	10
*     D.P p3P     3 <1       S1112     V07.     1     no hits - probably methylene chloride     16       2     0.9807     2-hydroxy-2-methylpropanenitrile     40       0.9783     2-propanone (acetone)     40       0.9783     0.methyldizene     40       0.9783     0.methyldizene     180       0.9784     tetrahydrofuran     180       0.9711    propioloctone     27       4     0.9723     c-thylethyl ketone     27       0.9713    propioloctone     13       0.9713    propinol     13       Acid     1     0.9805     benzothiazole       5     0.9704     1.2-benzisothiazole-3-carboxylic acid     5		В/	1			10
*         b3P         <1           S1112         V07.         1         no hits - probably methylene chloride         16           2         0.9807         2-hydroxy-2-methylpropanenitrile         40           0.9763         2-propanone (acetone)         40           0.9763         2-methyl-2-propanamine         40           0.9776         2-methyl-2-propanamine         180           0.9776         2-methyl-2-propanamine         180           0.9776         2-methyl-2-propanamine         180           0.9773         c-trahdrofuran         180           0.9773         c-thylpropanol         10           0.9733         d-pentene-2-one         13           0.9734         i-2-benzisothiazole         5         5			*	0.9635		3
51112       V07.       1       no hits - probably methylene chloride       16         2       0.9807       2-hydroxy-2-methylpropanenitrile       40         0.9783       butane       40         0.9783       butane       16         0.9783       butane       10         0.9783       caretone)       40         0.9783       dumethyllazene       180         0.9784       tetrahydrofuran       180         0.9771       -propioloctone       27         0.9773       enthyleropanol       27         0.9774       tetrahydrofuran       180         0.9773       enthyleropanol       27         0.9774       zamethylpropanol       27         0.9775       zamethylpropanol       13         0.9773       acetic acid ethenyl ether       13         0.9733       acetic acid ethenyl ether       5         no hits       13       13						
2       0.9807       2-hydroxy-2-methylpropanenitrile       40         0.9763       2-propanone (acetone)       40         0.9763       butane       0.9763         0.9776       2-methyl-2-propanamine       180         3       0.9776       2-methyl-2-propanamine       180         4       0.9778       c-methyletone       27         0.9711       -propioloctone       27         0.9713       c-thylethyl ketone       27         0.9717       2-methylpropanol       27         0.9718       c-thylethyl ketone       27         0.9717       2-methylpropanol       10         0.9718       acetic acid ethenyl ether       13         0.9717       2-methylpropanol       5         0.9713       acetic acid ethenyl ether       5         no hits       13					10P	1
2       0.9807       2-hydroxy-2-methylpropanenitrile         0.9783       2-propanoe (acetone)       40         0.9783       butane       40         0.9783       dumethyldiazene       9783         0.9776       2-methyl-2-propanamine       180         3       0.9774       tetrahydrofuran         4       0.9783       r-propioloctone         4       0.9783       r-ethylethyl ketone         0.9777       2-methylpropanol       27         0.9778       acetic acid ethenyl ether       7         0.9777       2-methylpropanol       7         0.9733       acetic acid ethenyl ether       13         Acid       1       0.9605       benzothiazole       5         5       scotti azole       5       5	S1112	V07.	1		no hits - probably methylene chloride	16
0.9763       butane         0.9763       dimethyldiazene         0.9776       2-methyl-2-propanamine         3       0.9776         0.9776       2-methyl-2-propanamine         3       0.9776         0.9776       2-methyl-2-propanamine         3       0.9776         0.9776       2-methyl-2-propanamine         3       0.9776         0.9771       -propioloctone         4       0.9773         0.9777       2-methyl ketone         0.9773       4-pentoned:one         0.9773       4-pentoned:one         0.9733       acetic acid othenyl ether         0.9733       acetic acid othenyl ether         no hits       13         Acid       1       0.9805         benzothiazole       5			2	0.9807	2-hydroxy-2-methylpropanenitrile	
0.9783       dimethyldiazene         0.9776       2-methyl-2-propanamine         3       0.9764       tetrahydrofuran         0.9771      propioloctone         4       0.9763       rethylektone         0.9773       rethylektone       27         0.9773       rethylpropanol       27         0.9733       4-pentonedrone       27         0.9733       4-pentonedrone       13         Acid       1       0.9805       benzothiazole       5         Acid       1       0.9805       benzothiazole       5					2-propanone (acetone)	40
0.9776       2-methyl-2-propanamine       180         3       0.9784       tetrahydrofuran       180         0.9711      propioloctone       27         4       0.9783       rethylethyl ketone       27         0.9717       2-methylpropanol       27         0.9733       4-pentene-2-one       13         0.9733       acetic acid ethenyl ether       13         Acid       1       0.9805       benzothiazole       5					Lutane	
3     0.9764     tetrahydrofuran     180       0.9711    propioloctone     27       4     0.9763     rethylethyl ketone     27       0.9769     2.3-pentonedrone     27       0.9777     2-methylpropanol     0.9733       0.9733     4-pentene-2-one     13       0.9733     acetic acid ethenyl ether     13       Acid     1     0.9805     benzothiazole     5						
0.9711        propioloctone         27           4         0.9753         : othylethyl ketone         27           0.9753         : othylethyl propanol         0.9733           0.9733         : othylethyl ether         13           5         no hits         13           Acid         1         0.9805         benzothiazole           0.9794         1.2-benzisothiazole-3-carboxylic acid         5					2-methy1-2-propanamine	
4       0.9783       : ethylethyl ketone       27         0.9783       2.3-pentoned:one       0.9777       2-methylpropanol         0.9733       4-pentone2-one       0.9733         0.9733       acetic acid ethenyl ether       13         5       no hits       13         Acid       1       0.9605       benzothiazole       5			3			180
0.9159         2,3-pentoned:one           0.9777         2-methylpropanol           0.9733         4-pentone-2-one           0.9733         acetic acid othenyl ether           5         no hits           1         0.9605           0.9794         1,2-benzisothiazole-3-carboxylic acid						
0.97?7     2-methylpropanol       0.9733     4-pentene-2-one       0.9733     acetic acid ethenyl ether       5     no hits       Acid     1       0.9605     benzothiazole       0.9794     1.2-benzisothiazole-3-carboxylic acid			4			27
0.9733       4-pentone-2-one         0.9733       acetic acid ethenyl ether         5       no hits       13         Acid       1       0.9805       benzothiazole       5         0.9794       1.2-benzisothiazole-3-carboxylic acid       5						
0.9733     accetic acid ethenyl ether       5     no hits       Λcid     1       0.9805     benzothiazole       0.9794     1,2-benzisothiazole-3-carboxylic acid						
5no hits13Acid10.9805benzothiazole50.97941.2-benzisothiazole-3-carboxylic acid5						
Acid 1 0.9805 benzothiazole 5 0.9794 1.2-benzisothiazole-3-carboxylic acid 5				0,9733		
0.9794 1.2-benzisothiazole-3-carboxylic acid			5		no hits	13
0.9794 1.2-benzisothiazole-3-carboxylic acid		Acid	1	0.9805	benzothiazole ·	5
			2		no hits	5

NOTES: (a) Concentration, for water samples is eq. (1.

(b) Unity DEP, Lide and diphenylamine were quantitated using standards of these compounds. Other quantitations are accroximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

1S1D Inter: 1 standard

.

NO Not alle to quantitate

BERG Dis(\_-(toylhexyl)phtrelate

DEP diethy (Athalate

(BF di-n-L.) lphthalate

site	Fraction	Feak No.	Similarity Index	Identity	Concentration (a) (b)
S1112	E∕N	1	0.8760 0.8712 0.8531	cyclohexanol cis-hex-2-en-1-ol cis-3-hexenylbutyrate	6
		2	0.9304 0.8695 0.8648	cyclohexanone 2-rethylcyclopentanone 5-methyl-2-oxo-2,3-dihydrofuran	11
		3	0.0040	no hits	10
		4		BEHP	56
		*		DED	<1
		*		DBi,	<1
S1115	\ O <b>A</b>	1		no hits - probably methylene chloride	16
		2		no hits - probably tetrahydrofuran	11
		3	0.9735	1-hexyn-3-ol	12
	<i>l.</i> cid	1		BELIP	2
	E/N	1		BEIIP	225
		*		DD12	1
		*		DEP	<1
51117	ACV	1		no hits - probably methylene chloride	14
		2	0.9783	tetrahydrofuran	
			0.9764	tetrahydrofuran	23
			0.9737	2-aethoxy-1-propene	
			0.9737 0.9737	2,2-dimethyloxirane	
			0.9737	methyl isopropenyl ether isobutylene oxide	
			0.9737	1,2-epoxy-2-methylpropane	
		3	0.9810	trichloromethane	16
		4	0.9312	carbon tetrachloride	6 <b>9</b>
			0.7557	trichloronitromethane	
	Acid	1		BEIP	18

NOTES: (a) Concentration for water samples is  $\mu g/1$ .

(b) Only DEP, DBP and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

ISTD = Internal standard

- Ng Not able to quantitate
- DEHP = Dis(2-etaylhexyl)phthalate
- LEP Hethylyschalate
- . BP di-n-but, lphahabate

Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a) (b)
S1117	B/1	1		ЫНР	104
		*		DFP	<1
		*		DBP	<1
S1119	VOA	1 2	0.9756	methylene chloride	18
		2		no hits - probably tetrahydrofuran	11
		3	0.9783	2-butanone (methyl ethyl ketone)	14
			0.9759	2,3-pentanedione	
			0.9736	2-methylpropanol	
			0.9733	4-penten-2-one	
			0.9733	acetic acid ethenyl ester	
		4	0.9784	pentane	11
	Acid	1		BEHP	40
	B/::	1	0.9813	1,1'-oxybisoctane	8
			0.9799	3-chlorodecane	
			0.9799	hepta decane	
			0.9795	2-ethylhexanol	
			0.9794	Lexadecane	
			0.9794	pentadecane	
		2	0.9815	(2-ethylhexyl)ether	9
			0.9815	1,1'-oxybis octane	
			0.9815	<pre>i,l'oxybis(2-ethyl)hexane</pre>	
			0.9604	n-heneicosane	
			0.9803	tetramethylheptadecane	
		3		EURP (No 1.s.)	36
	•	4		no hits (hydrocarbon)	12
		5	0.9935	11-decy1docosane	10
			0.9831	triacentane	
			0.9328	<pre>/ctacosane</pre>	
			0.9825	pentacosane	
			0.9310	dotriacontane	
		*		L (°P	<1
		*		DBP	<1

NOTES: (a) Concentration for water samples is  $\mathbb{Z}_{4/2}$ .

(b) unly DEP, REP and diphenylamine were quantitated using standards of these compounds. Other quantitations are the recommended and are calculated against the ISTU peak. Peak heights were measured from the total ion profile and a cosponse factor equal to that of the ISTD was used.

.

1311 Intern 1 standard

ъ

- NQ - Not able to quantitate
- EEE bis(2-(th/lhoxy1)phthalate
- LEi dieth, thalate
- LB: di-n-butylphahalate

(b)

Site	Fraction	Peak No.	Similarity Index	Identity	<u>Concentration</u> (a) (
S1121	VCA	1 2	0.9806	no hits - probably methylene chloride tetrahydrofuran	15
		2	0.9779	methyl isopropanyl ether (2-methoxy-l-propene)	23
			0.9779	2,2-dimethyloxirane (isobutylene oxide; 1,2-epoxy-2- methylpropene)	25
		3	0.9810	trichloromethane (chloroform)	11
		4	0.9752	pentane	
	Acid	1		BLHP	27
	B/N	1		B.₩1P	35
		*		DBP	1
		*		D1.P	<1
S1122	VOA	1	0.9734	dichloromethane (methylene chloride)	39
		2	0.9756	2,2-dimethyloxirane	13
		3	0.9806	pentane	12
	Acid			no peaks other than ISTD	
	B/1.	1		BLHP	33
		*			<1
		*		000	<1
S1123	VGA	1	0.97%6	dichloromethane	20
		2	0.9754	protane	10
	Acid	1	0.9802	tridecanol	8
			0.97:9	pulmitic acid	
			0.87	2-methyl-1-dodecanol	
			0.8011	ld-methyltetradecanoic acid, methyl ester dioctyl ether	
		2	0.9797	ortadecanoic acid	10
		-	0.9792	hoxadecanoic acid	
			0.8561	lé-pentadecypoic acid, methyl ester	
			0.9790	delc acid	
		3		BEMP (no l.s.)	4

NOTES:  $\int_{-\infty}^{\infty} Correspondent to for water samples is <math>\mu \sigma^{-1}$ .

<sup>(E)</sup>Only DEP, DBF and diphenylamine were contitated using standards of these compounds. Other quantitations are apply simate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

JC1D = Internal standard

•

Meril t able to quantitate

ED TE = His(2-ethylhexyl)phth date

ill = liethylphinalate

. . = lo-n-butylynthalate

Site	Fraction	Peak No.	Similarity Index	Identity	<u>Concentration</u> (a)(b)
S1123	E711	1 * *		BEHP DEP DBP	32 >1 ~1
S1125	717	1 2	0.9762	no hits - probably methylene chloride pentane	12 11
	Acid	1 2		no hits BEHP	3 8
	B/M	1 * *		BEHP DEP DBP	27 <1 <1
S1127	VCA	1 2 3	0.9734 0.9762 0.9735 0.9735 0.9732	dichloromethane tetrahydrofuran 2-methoxy-l-propene 2,2-dimethyloxirane pentane	22 33 12
	Azid			BEHP	90
	Е. ::	1 2 *		no hits -BEH? DEP DBT	5 328 1 1
S.130	$\nabla \partial h$	1 2	0.9733 0.9789	dichloromethane trichloromethane	10 11
	Acid	1		BLH:	44
	в. (1	1 * *		BEHP DIP DBP	225 1 <1

NOTES: (3) Concentration for water samples is hg/l.

(E-Only DDP, DBP and diphenylatione were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

- ISTD = 1:++ rnal stundard
- $M_{\rm C}^{\rm op}$  =  $M_{\rm C}^{\rm op}$  able to guantitate
- ELED: = 1:: (2-ethylhexyl) phthalatte
- L = \_\_\_\_thylphthalate
- Lul = ...-n-butylphthalate

	Site	Fraction	Peak No.	Similarity Index	Identity	Concentration (a) (b)
	S1133	VOA	1	0.9756	dichloromethane	13
			2	0.9757	2,2-dimethyloxirane	11
				0.9806	tetrahydrofuran	
			3	0.9752	$\beta$ -propioketone trichloromethane	19
			4	0.9785	2-butanone	17 19
				0.9761	2-methylpropanol	
				0.9761	2,3-pentanedione	
		Acid	1		BEHP	38
		b/n	,		<b>D</b> AVID	104
		D/N	1		BEHP DEP	104 <1
			*		DHP	<1
	S1134	VOA	1		no hits - probably methylene chloride	13
			2	0.9788	tetrahydrofuran	300
				0.9725	f-propiolactone	
				0.9808 0.9758	2-butanone	13
				0.9755	2-methylpropanol acetic acid ethenyl ester	13
				0.9707	2,3-pentanedione	
				0.9755	vinyl acetate	
Superior Burning Award	+		4	0.8575	tetrachloroethylene	NQ
LINE	3	• •	,			17
puis		Acid	1		BEHP	17
A. INSTAND		B/N	1	0.9206	cyclohexanone	12
12000 1				0.8531	2-methyl-cyclopentanone	
maild				0.8694	5-methyl-2-oxo-2,3-dihydrofuran	
Kin			2	0.9775	2-ethyl-4-methylol-1,3-dioxalane	10
,			2	0.8647	1,1-diethoxybutane	-
			3	0.9786 0.9787	heptadecane octadecane	7
				0.9787	nchadecane	
				0.9783	3-chlorodecane	
				0.9782	hexadecane	

NOTES: <sup>(a)</sup>Concentration for water samples is ug/1.

(b) Only DEP, DBP and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a mapping factor equal to that of the ISTD was used.

- ISTD = Internal standard
- by = sot able to quantitate
- FERE Dis(2-ethylhexyl)phtrelate
- 15P diethyl; hthalate
- CSP / n-n-butylphthalute

S1134       B/N       4       0.9797       heptadecane         0.9794       hexadecane         0.9793       pentadecane         0.9792       2-ethyl-1-hexanol         0.9791       tetradecane         0.9792       2-ethyl-1-hexanol         0.9791       tetradecane         0.9791       2,5-dimethyltetradecane         5       0.9797
0.9793         pentadecane           0.9792         2-ethyl-1-hexanol           0.9791         tetradecane           0.9791         2,5-dimethyltetradecane           5         0.9797
0.97922-ethyl-l-hexanol0.9791tetradecane0.97912,5-dimethyltetradecane50.979712
0.9791tetradecane0.97912,5-dimethyltetradecane50.9797heptadecane12
0.97912,5-dimethyltetradecane50.9797heptadecane12
5 0.9797 heptadecane 12
0.9794 hexadecane
0.9793 pentadecane
0.9792 2-ethyl-l-hexanol
0.9791 tetradecane
0.9791 2,5-dimethyltetradecane
6 0.9825 rutylbutoxyethyl phthalate 5
0.9906 2-butyl-2-oxoethyl-butylphthalate
0.9825 butyl phthalyl butyl glycolate
7 no hits 6 8 0.9797 heptadecane 11
8 0.9797 heptadecane 11
0.9794 hexadecane
0.9793 pentadecane
0.9792 2-ethyl-l-hexanol
0.9791 tetradecane
0.9791 2,5-dimethyltetradecane
9 BEHP 47
10 0.9797 heptadecane 6
0.9794 hexadecane
0.9793 pentadecane
0.9792 2-ethyl-l-hexanol
0.9791 tetradecane
0.9791 2,5-dimethyltetradecane
* DEP <1
* DEP <1

NOTES: (a) Concentration for water samples is µg/l.

(b) Only DEP, DBP and diphenylamine were quantitated using standards of these compounds. Other quantitations are approximate and are calculated against the ISTD peak. Peak heights were measured from the total ion profile and a response factor equal to that of the ISTD was used.

ISTL = Internal standard

.

NQ· = Not able to quantitate

BEHF = pis(2-ctnylhexyl)phthalate

DEP - diethylphthalate

DBP di-n-butylphthalate