Appendix G
Analytical Data QA/QC Report

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List of Acronyms

ADR	automated data review
AFB	air force base
AR/COC	Analysis Request/Chain of Custody
bgs	below ground surface
CCB	continuing calibration blank
CCV	continuing calibration verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
DQO	data quality objectives
FUDS	Formerly Used Defense Sites
GPL	GPL Laboratories, LLLP
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ICAL	initial calibration
ICB	initial calibration blank
ICV	initial calibration verification
ID	identification
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MC	munitions constituents
MDL	method detection limit
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MS	matrix spike
MSD	matrix spike duplicate

NWO	Omaha District Military Munitions Design Center
PQL	practical quantitation limits
PRG	preliminary remediation goal
PETN	pentaerythritol tetranitrate
PSAP	program sampling and analysis plan
QA/QC	quality assurance/quality control
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SEDD	staged electronic data deliverable
SDG	sample delivery group
Shaw	Shaw Environmental, Inc.
SI	site inspection
SOPs	standard operating procedures
SS-WP	site specific-work plan
Tetryl	methyl-2,4,6-trinitrophenylnitramine
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit

G.1.0 Introduction

This appendix presents the Analytical Data QA/QC Report for Boardman Air Force Base (AFB) Site Inspection (SI). This report will discuss results of the quality assurance/quality control (QA/QC) measures implemented during the sampling and analysis portion of the SI at Boardman AFB, located approximately 5.5 miles south of Boardman, Oregon, in Morrow County under the Formerly Used Defense Site (FUDS) Military Munitions Response Program (MMRP). The quality indicators from every aspect of the data collection have been reviewed, and an assessment of the data with regard to project-specific objectives is presented. Successful execution of project-specific objectives and procedures provides strong support for the acceptance of the data as adequate for the purpose of evaluating if the Boardman AFB site requires further response action due to the presence of munitions and explosives of concern (MEC) / munitions constituents (MC).

The data review process presented in this report compares sample results to pre-established criteria referenced in Shaw's FUDS MMRP Program Sampling and Analysis Plan (PSAP) Addendum, (Shaw, 2005) to confirm that the data are of acceptable technical quality. GPL Laboratories, LLLP (GPL) provided Shaw Environmental, Inc. (Shaw) with a Level 4 data package including "Contract Laboratory Program (CLP)-Like" summary forms, Staged Electronic Data Deliverables (SEDD) Stage 2b (version Draft 5.0), and Automated Data Review (ADR) compatible A1, A2, & A3 files for all sample delivery groups (SDG). Shaw conducted a data assessment on all samples collected in support of this SI. One-hundred percent of the analytical data have been reviewed and validation qualifiers assigned based on U.S. Environmental Protection Agency (USEPA) CLP National Functional Guidelines for Organic Data Review, October 1999 and USEPA CLP National Functional Guidelines for Inorganic Data Review, October 2004. Automated Data Review (ADR) software (version 8.1) was used to assist in the data validation process for all areas with the exception of initial calibration blanks (ICB) / continuing calibration blanks (CCB), interference check standards, serial dilutions, and second column confirmation which were assessed manually. Data were evaluated against specific criteria to verify the achievement of all precision, accuracy, representativeness, completeness, comparability, and sensitivity goals established to meet the project data quality objectives (DQO). To verify that these DQOs were met, field measurements, sampling and handling procedures, laboratory analysis and reporting, and all non-conformances and discrepancies in the data were examined to determine compliance with the appropriate and applicable procedures. The results of this review are presented in the following sections, with all outliers or non-conformances discussed where they occurred.

This report is divided into three subsections. Section G.2.0 discusses the overall field investigation and QC procedures used by Shaw during the sampling effort. Section G.3.0 outlines the analytical program and the associated QC activities as specified in Shaw's Boardman AFB Site-Specific Work Plan (SS-WP) and in Shaw's FUDS MMRP PSAP. The final part of this document, Section G.4.0, summarizes the data findings and their overall impact on the usability of the analytical data.

G.2.0 Field Sampling and QC Activities

Shaw is responsible for conducting the SI at Boardman AFB, which is located in the northwest region, under the MMRP Contract No W912DY-04-D-0010, Delivery Order 003 managed by the Omaha District Military Munitions Design Center (NWO). Field activities at this site included the collection of soil and sediment samples (0 to 0.5 foot below ground surface [bgs]) from twenty-five locations. Soil and sediment samples were submitted to the laboratory with requested analyses of aluminum, chromium, copper, iron, lead, manganese, molybdenum, and nickel by SW-846 6020A (soil digestion method 3050B), mercury by SW-846 7471A, and explosives by SW-846 8330A including nitroglycerine and pentaerythritol tetranitrate (PETN). Table G-1 summarizes the location identification (ID), the sample identity or number, sample purpose, sample matrix, date of collection, GPL SDG identity, and the analytical program for each sample collected for the Boardman AFB SI.

Sample shipments from the field were performed under custody and documented using standard GPL Analysis Request/Chain of Custody (AR/COC) forms. These forms provide project-specific analytical specifications and QC instructions to the laboratory. No amendments were made to the original AR/COCs associated with the Boardman AFB SI.

G.2.1 Field Duplicates

Field duplicate samples are collected and submitted "blind" to the laboratory for analysis along with their corresponding original sample. The data generated from the analysis of field duplicate samples are used to evaluate the precision of the sample collection and analysis procedures. Field duplicate samples are generally collected at a frequency of approximately one for every ten samples collected (10 percent) per matrix. A high relative percent difference (RPD) value between a parent sample's result and its corresponding field duplicate's result may be attributed to the difference in sample matrix or distribution of the constituent within the sample, rather than the lack of precision of the collection process. Also, when "estimated" results are reported, there is a potential for increased variability between the primary and duplicate sample results. At low concentrations the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. RPD is calculated by using the following formula:

$$\text{RPD} = \frac{(V_1 - V_2)}{\frac{(V_1 + V_2)}{2}} \times 100$$

where:
RPD = relative percent difference
V1 = value 1; V2 = value 2

In cases where duplicates were performed and both results are less than the method detection limit (MDL) and cases where one result is greater than the MDL, and the second result is non-detect, the RPD is not calculated. In these cases where the RPD was not calculated, "NC" (not calculated) is denoted in the RPD column. Precision evaluation criteria for field duplicate comparison was established at RPD<50% for soils/sediments. Table G-2 summarizes the calculated RPD between the parent sample result and its corresponding field duplicate result for soil. The calculated RPD between the parent sample values and their corresponding field duplicates met the evaluation criteria.

G.2.2 USACE Split Samples

No U.S. Army Corps of Engineers (USACE) field split samples were collected during this Boardman AFB SI.

G.2.3 Equipment Rinsates

Equipment rinsates are used to assess the effectiveness of the decontamination procedures used by the sampling team on reusable sampling equipment. Disposable sampling equipment was used during the Boardman AFB SI, therefore no equipment rinsate samples were collected.

G.2.4 Field Blanks

Field blanks or material blanks are collected to assess potential contamination introduced to the sample matrix in the field through sample handling procedures. Field blanks are generally prepared from a clean source water (deionized water) used during decontamination procedures. No field blanks were collected during the Boardman AFB SI.

G.3.0 Analytical Program and QC Activities

The project QA/QC program described in the Boardman AFB SS-WP and the Shaw PSAP Addendum was followed for the collection and laboratory analysis of samples. Each of the analytical methods used require that method-specific QA/QC protocols be followed during sample analysis. These protocols are a critical part of the methods employed and were followed by the laboratory during sample analysis. Specific measures included detailed record keeping procedures, instrument calibrations, and analysis of method blanks, blank spikes, MS/MSD, surrogates, second-column confirmation and serial dilutions. Attachment 1 and Attachment 2 to this appendix contains both a summary of analytical results and a summary of analytical results greater than the MDL, respectively. These data summaries also include the assigned data validation qualifiers. Definitions of laboratory and data validation qualifiers are found in Table G-3. Data validation qualifier reason code definitions are found in Table G-4. Approved variances to Shaw's PSAP Addendum are included as Attachment 3.

G.3.1 Laboratory QA/QC Procedures

The following sections discuss a few of the QA/QC protocols required and performed by the laboratory during this SI.

G.3.1.1 Method Blanks

Method blanks were analyzed with each analytical "batch" processed on a per matrix (i.e., soil and water) basis. These blanks were carried step-wise through the same analytical procedure as the field samples including the addition of solvents, surrogate and standard spikes, and reagents as required in the analysis process. The purpose of the blank is to identify any possible contaminants that may be introduced to the sample as a result of the analytical process. During validation, the data validators evaluated all blank data associated with each sample. Data were evaluated based on USEPA CLP *National Functional Guidelines for Organic Data Review* and USEPA CLP *National Functional Guidelines for Inorganic Data Review* guidance documents and were qualified accordingly.

Target compounds detected in associated blanks increase the uncertainty regarding the presence of the same constituents in field samples. For a compound identified in both a blank and field sample, it must be present at a concentration of five times higher in the field sample to be considered a "hit". Common laboratory contaminants such as acetone, methylene chloride, and toluene are not assumed present until sample concentrations exceed ten times the associated blank value. GPL does not consider any explosives or metals as common laboratory contaminants. This is referred to as the

5X/10X rule.

Field sample concentrations were evaluated during data validation to determine if the sample results could have been biased by the presence of any contamination measured in method blanks, ICBs and/or CCBs. The following sample results were impacted by blank contamination:

SDG	Analysis	Blank ID	Analyte(s)	Action
703016	SW6020A	CCBs	Molybdenum	Molybdenum results for samples NWO-030-0001, NWO-030-0002, NWO-030-0003, NWO-030-0004, NWO-030-0005, NWO-030-0006, NWO-030-0007, NWO-030-0009, NWO-030-0010, NWO-030-0011, NWO-030-0012, NWO-030-0013, NWO-030-1001, and NWO-030-1002 were qualified "U" due to contamination detected in the bracketing CCBs.
703017	SW6020A	BLK96807 (Method Blank)	Mercury	Mercury results for samples NWO-030-5001, NWO-030-5002, NWO-030-5005, NWO-030-5006, NWO-030-5007, NWO-030-5008, NWO-030-5009, NWO-030-5010, NWO-030-5011, and NWO-030-5012 were qualified "U" due to contamination detected in the associated method blank.

G.3.1.2 Surrogate Spikes

Spiked surrogate compounds were used in the analytical program to monitor the efficiency of the sample preparation and accuracy of analysis procedures on a sample-by-sample basis for all explosive compounds. The compounds used as surrogates, and the target acceptance limits for their recovery, were those specified in Shaw's PSAP Addendum. The percent recoveries of the surrogate compounds were within the project-specified limits for all explosive analyses. It should be noted surrogate recovery evaluation is primarily evaluated from the standard SW-846 8330A analyses. This is due to nitroglycerine and pentaerythritol tetranitrate (PETN) being analyzed from the same extract as the standard SW-846 8330A analytes.

G.3.1.3 Matrix Spikes and Laboratory Control Spikes

Two types of spikes were generally performed for all analyses: those spikes applied to the sample matrix, identified as MS, and those applied to a "blank" matrix known as a laboratory control sample (LCS). The spiked compounds are target analytes that are quantified during performance of the method. Spikes are introduced during sample preparation on an aliquot of the sample, or a blank matrix. Results of these spiked aliquots are then compared to the native concentrations of the same analytes and a recovery calculated. Recovery of the spiked compound is used as an assessment of accuracy on the sample matrix analyzed. These results are useful in distinguishing sample matrix

interferences from analysis interferences through a comparison of MS and blank spike recovery data. Often, MSs are performed in duplicate (as a matrix spike duplicate [MSD] or LCS duplicate [LCSD]) on prepared sample aliquots. In this manner, an assessment of precision can be quantified as the RPD of the original and duplicate spike. The target acceptance limits are presented in Shaw's PSAP Addendum.

Matrix spikes are assigned at a frequency of approximately 5%, or 1 for every 20 field samples collected. Two MS/MSD pairs were collected in the field and are associated with samples NWO-030-0010 and NWO-030-5005. These samples correspond to sample locations 030A-011 and 030A-019 respectively. If a sample is designated for analysis as an MS/MSD, additional sample volume is provided to the laboratory. This sampling meets the collection criteria as specified in Shaw's Boardman AFB SS-WP and PSAP Addendum.

The MS/MSD criteria were met, with the exception of the following, which exhibited percent recoveries and/or RPDs outside QC limits:

SDG	Analysis	Sample Number	Analyte(s)	Action
703016	SW8330A (Modified)	NWO-030-0010 (MS/MSD)	PETN (HB)	No action required for PETN; explosive not detected above the MDL for sample NWO-030-0010.
	SW6020A	NWO-030-0010 (MS/MSD)	Aluminum (HB) Iron (HB)	No action required for aluminum and iron; parent sample concentrations were 4x greater than the MS-MSD spike concentration.
703017	SW6020A	NWO-039-0006 (MS/MSD)	Aluminum (HB) Iron (HB)	No action required for aluminum and iron; parent sample concentrations were 4x greater than the MS-MSD spike concentration.

HB – high bias

No significant problems were identified with the MS recoveries that caused sample results to be qualified "R" as rejected. All other MS/MSD parameters met the target acceptance criteria required as established in Shaw's PSAP Addendum.

LCS results are used to evaluate laboratory method performance in the same manner as the MS/MSD results, except the LCS is not performed on an actual field sample matrix. An LCS is prepared for each analytical batch for each parameter and matrix analyzed. All LCS spike recoveries met the established acceptance criteria.

G.3.1.4 Calibrations

Initial calibration information is verified to demonstrate that reported results are comparable to known concentrations of target compounds. A series of standard reference solutions containing all target constituents are analyzed using the type of instrumentation specified by the method. The standards are used to determine the sensitivity of the analysis and the effective analytical (i.e., linear) range for which data can be accurately reported.

High initial calibration (ICAL) Percent Relative Standard Deviation (%RSD) indicates that a nonlinear response was obtained during the initial calibration. A low ICAL mean Relative Response Factor (RRF) indicates the compound exhibits poor response to the selected method (or detector). For all sample analyses, the ICAL correlation coefficient of > 0.995 (the industry standard) and relative standard deviation (%RSD) acceptance criteria of < 20% (the criteria for relative response factor [RRF] and %RSD are based on SW-846 Method 8000B) were met for all analyses. All CCVs were within QC criteria.

G.3.1.5 Second Column Confirmation

Sample results reported from GC or HPLC methodologies (i.e., SW-846 8330A) are confirmed by using a dissimilar column or dissimilar detector. The analyte(s) must be detected by both the primary and confirmation columns or detectors in order for the analyte(s) to be confirmed as being present in the sample. Agreement or analytical precision between the two results is calculated as RPD. If the calculated RPD between the two differing columns or detectors exceeds 40%, then the result reported from the primary column is reported as estimated or "J" qualified. It should be noted at low concentrations the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. Also, if analytes co-elute on the confirmation column; results reported from the primary column are qualified “J” as estimated. No explosives were detected above the MDL for samples associated with the Boardman AFB SI.

G.3.1.6 Serial Dilutions

For metals analyses, a serial dilution is analyzed to verify that no matrix effects are present. A percent difference is calculated between the original result and a second result calculated from a 1:4 dilution of the original sample. Acceptance criteria of < 10% for original results greater than 100x their corresponding MDL (criteria for percent difference are based on SW-846 Method 6020A) were met.

G.3.2 Reporting Limits

Practical quantitation limits (PQL) used for this project are those statistically determined by GPL. The analytical program executed required the use of SW-846 methods, which specify the procedure for calculating the PQLs presented. Each laboratory is required to demonstrate method performance through MDL studies for every method employed. These studies are required to be laboratory-specific so that individual laboratory variables such as equipment brands, reagent suppliers, and chemist technique are factored into the performance study. MDLs are established using controlled matrices (i.e., deionized water). The PQL calculation adjusts the limit by a predetermined mathematical factor for the analysis of actual environmental sample matrices (i.e. soil, groundwater, etc.). For purposes of clarity and consistency with respect to terminology, the term "reporting limit" (RL) has been substituted for PQL when referencing the limit of detection reported by the laboratory for each individual sample and parameter. The actual values reported have been corrected for all necessary dilutions, dryness, and interference factors as applicable based on the resulting analytical data for a sample.

MDLs, PQLs, and RLs are generally defined as follows:

- ***MDL.*** The minimum concentration of an analyte that can be determined with 99 percent confidence that the true value is greater than zero.
- ***PQL.*** The lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The PQL is set at the lowest standard used in the ICAL or higher for each target analyte.
- ***RL.*** This number is equivalent to the PQL.

The MDL is the lower limit at which the laboratory can differentiate a measurement from background. The MDL is determined in accordance with the procedures in 40 Code of Federal Regulations (CFR) Part 136. A PQL, or RL, is the lower limit at which a measurement becomes meaningful. The RL is generally a multiple of three to five times the MDL.

Several samples had elevated reporting limits due to suspected matrix effects and complications encountered at the laboratory. The amount of solvent added during the SW8330A extraction process had to be altered in order to properly extract the explosive compounds from the soil matrix. GPLs PQLs are below the general RLs presented in the MMRP PSAP, however, in some cases, they are slightly higher than those listed in Shaw's PSAP Addendum. Actual sample reporting limits can be reviewed on a sample by sample basis by reviewing the data summary presented in Attachment 1. Also, a general comparison of laboratory reported results, laboratory PQLs, and laboratory MDLs to SI screening levels are found in Tables G-6 and G-7. Reported sample results provide sufficient sensitivity in regarding the presence of lead associated with past military activities at this site.

G.3.3 Holding Times

All laboratory results submitted for this SI have been reviewed with respect to laboratory adherence to extraction and analysis holding times. Maximum sample extraction and analysis hold times are presented in Tables 4-1 and 4-2 of Shaw's PSAP Addendum. All holding time criteria were met.

G.4.0 Data Evaluation and Usability

The analytical data review process identified a few analytical nonconformance issues that were noted during this analytical program. These QC exceedances have been discussed in the text of this Analytical Data QA/QC Report. Table G-5 summarizes impacted sample results associated with QC exceedances. Table G-3 defines laboratory and data validation qualifiers and Table G-4 defines data validation qualifier reason codes.

The following definitions are used for defining precision, accuracy, representativeness, completeness, comparability, and sensitivity as they have been applied to this evaluation:

Precision. Precision is a measurement of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. For this project, precision data were obtained through the analysis and evaluation of field duplicate samples as RPD. RPD is calculated as follows:

$$\text{RPD} = \frac{(V_1 - V_2)}{\frac{(V_1 + V_2)}{2}} \times 100$$

where:
RPD = relative percent difference
V1 = value 1; V2 = value 2

Parent sample and field duplicate comparisons show that the field team is consistent in their sample collection practices. Field duplicate results are summarized in Section G.2.1 and Table G-2. Precision was also evaluated through the comparison of MS and MSD or LCS and LCSD results. The spiked samples (MS, MSD, LCS, LCSD) RPDs are evaluated during data validation and data are qualified accordingly. RPD within the acceptance criteria indicates that the laboratory is performing adequately and that the results are reproducible for the analytes of interest at this site. Acceptance criteria are defined in the MMRP PSAP and Shaw's PSAP Addendum for each analyte of concern. These data and all necessary qualifications are discussed in Section G.3.1.3. In respect to precision, the data are usable for their intended purpose.

Accuracy. Accuracy is a measurement of bias in a system and is expressed as a percent recovery. Accuracy is typically determined through the analysis and evaluation of blanks, LCSs, and MS/MSD samples. Percent recovery is calculated as follows:

$$\% \text{ Recovery} = 100 \times \frac{\text{measured value}}{\text{true value}}$$

MS/MSDs, LCS, and surrogates and all data qualifications are summarized in Sections G.3.1.2 and G.3.1.3. The noted QC exceedances discussed in these sections resulted in the qualification of the reported data as being estimated ("UJ"/"J") but were not significant enough for rejection of the data. In respect to accuracy, the data are usable for their intended purpose.

Representativeness. Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix and site conditions. General requirements and procedures referenced in Shaw's PSAP Addendum and corporate standard operating procedures (SOPs) for sample collection and handling are designed to maximize sample representativeness. Representativeness also can be monitored by reviewing field documentation and by performing field audits. Soil samples were collected at locations likely to be representative of MC contamination based on physical evidence of contamination or source areas (eg., staining, debris, sumps, or extent of magnetic anomalies). Sediment samples were collected based on field observations of surface topography and drainage, at locations that are within a surface water or runoff pathway downslope of a specific potential source area.

All samples were collected using SOPs and were fully documented through the use of standard field forms. Samples are representative of the matrix and site sampled.

Completeness. Completeness is a measure of the amount of valid data obtained during a sampling event as compared to the amount of data planned for collection and determined to be usable for the intended purpose. Typically, an overall completeness goal of 95 percent is set for projects of this type. Completeness is calculated as follows:

$$\%C = (U/T) \times 100$$

where:
%C = Percent completeness;
U = Number of measurements judged usable; and
T = Total number of measurements.

During this SI, 28 samples were collected resulting in a total of 452 records. No results were rejected during the data quality evaluation out of the total 452 records. A summary of data

qualification and the reasons for qualifier assignments is presented in Attachment 1. Using the above calculation, 100 % completeness is achieved for this sample event.

Field completeness is estimated as the percentage of all planned samples that were actually collected and analyzed. The calculation is as follows:

$$\%FC = (A/P) \times 100$$

where:
%FC = Field Percent Completeness;
A = Actual number of samples collected, and
P = Number of planned samples to collect

Discussion of field completeness is provided in the main text of the SI.

Comparability. Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability ensures that results for the sampling event can be compared with data from past and future sampling programs. Comparability for this sampling event was achieved through the use of established and recognized techniques and through the laboratory's use of standard USEPA methodology. All samples collected for this task were subjected to the same sampling, handling, preparation, analysis, reporting, and validation criteria for the purpose of achieving comparability goals within the data set.

Sensitivity. Sensitivity is defined as the ability of the laboratory's established MDL/PQL to meet project-specific DQOs. MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The RL is a threshold value based upon the sensitivity capability of method and instrument. PQLs are normally set at a minimum of three times the MDL. MDLs/PQLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the PQL. Therefore, these analyte values must be flagged as estimated quantities ("J" flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs and PQLs and the following regulatory values was performed. The laboratory soil PQLs/MDLs were compared against the following screening levels:

- Calculated Boardman AFB SI Surface Soil Background 95th upper tolerance limit (UTL) / 95th Percentile (Surface Soil)
- "3x" Maximum Concentration from Media Background Sample (Sediment only)
- Ecological Screening Levels comprised from Oregon Department of Environmental Quality Screening Level Values (December 2001), USEPA Region 5 (August 2003), USEPA Region 7, USEPA Region 8, USEPA Region 10, and Lower of Talmage, et al, (1999) or Los Alamos National Laboratory (2005) values
- USEPA Region 9 Preliminary Remediation Goal (PRG) for Residential Soils

GPL's soil MDLs/PQLs for all target analytes of interest met or were below SI screening levels.

G.4.1 Statement of Data Usability

One-hundred percent of the analytical data have been reviewed and validation qualifiers assigned based on USEPA CLP *National Functional Guidelines for Organic Data Review,* October 1999 and USEPA CLP *National Functional Guidelines for Inorganic Data Review*, October 2004. ADR software (version 8.1) was used to assist in the data validation process for all areas with the exception of ICBs, CCBs, interference check standards, serial dilutions, and second-column confirmation which were assessed manually. Data were evaluated against specific criteria to verify the achievement of all precision, accuracy, representativeness, completeness, comparability, and sensitivity goals established to meet the project DQOs.

The overall quality of the data collected for the Boardman AFB SI has been discussed in this Analytical Data QA/QC Report. Results of the analyses as discussed in this evaluation are indicative of the media analyzed with the exception of QC exceedances listed below:

- Molybdenum results for surface soil samples NWO-030-0001, NWO-030-0002, NWO-030-0003, NWO-030-0004, NWO-030-0005, NWO-030-0006, NWO-030-0007, NWO-030-0009, NWO-030-0010, NWO-030-0011, NWO-030-0012, NWO-030-0013; and sediment samples NWO-030-1001, and NWO-030-1002 were qualified "U" due to CCB contamination

- Mercury results for surface soil samples NWO-030-5001, NWO-030-5002, NWO-030-5005, NWO-030-5006, NWO-030-5007, NWO-030-5008, NWO-030-5009, NWO-030-5010, NWO-030-5011, and NWO-030-5012 were qualified "U" due to method blank contamination

No data was qualified "R" as unusable. Overall, these data do reflect expected site conditions and are fully usable for their intended purpose.

Table G-1

Summary of Samples Collected and Sample Tracking Information
Boardman Air Force Base

Location ID	Sample Number	Sample Purpose	Sample Type	Date Collected	Sample Depth (ft)	Laboratory SDG Number	Select Metals* by SW-846 6020A	Mercury by SW-846 7471A	Explosives by SW-846 8330A	Nitroglycerine by SW-846 8330A (Modified)	PETN by SW-846 8330A (Modified)
Target No. 1											
030A001	NWO-030-0001	REG	SS	27-Feb-07	0 - 0.5	703016-001	X	X	X	X	
Target No. 2											
030A002	NWO-030-0002	REG	SS	27-Feb-07	0 - 0.5	703016-002	X	X	X	X	
030A003	NWO-030-0003	REG	SS	28-Feb-07	0 - 0.5	703016-003	X	X	X	X	
Carty Reservoir Bomb Target											
030A004	NWO-030-0004	REG	SS	27-Feb-07	0 - 0.5	703016-004	X	X			
030A005	NWO-030-0005	REG	SS	26-Feb-07	0 - 0.5	703016-005	X	X	X	X	
030A006	NWO-030-1001	REG	SD	27-Feb-07	0 - 0.5	703016-006	X	X	X	X	
	NWO-030-1003	FD	SD	27-Feb-07	0 - 0.5	703016-007	X	X	X	X	
Range Complex No. 1, Demolition Area											
030A007	NWO-030-0006	REG	SS	28-Feb-07	0 - 0.5	703016-008	X	X	X	X	X
030A008	NWO-030-0007	REG	SS	28-Feb-07	0 - 0.5	703016-009	X	X	X	X	X
	NWO-030-0013	FD	SS	28-Feb-07	0 - 0.5	703016-010	X	X	X	X	X
Range Complex No. 1, Turret Gunnery Range											
030A009	NWO-030-0008	REG	SS	26-Feb-07	0 - 0.5	703016-011	X	X			
030A010	NWO-030-0009	REG	SS	27-Feb-07	0 - 0.5	703016-012	X	X			
Demolition Area No. 2											
030A011	NWO-030-0010	REG	SS	27-Feb-07	0 - 0.5	703016-013	X	X	X	X	X
	NWO-030-0010-MS	MS	SS	27-Feb-07	0 - 0.5	703016-013-MS	X	X	X	X	X
	NWO-030-0010-MSD	MSD	SS	27-Feb-07	0 - 0.5	703016-013-MSD	X	X	X	X	X
030A012	NWO-030-0011	REG	SS	27-Feb-07	0 - 0.5	703016-014	X	X	X	X	X
Impact Area											
030A013	NWO-030-0012	REG	SS	27-Feb-07	0 - 0.5	703016-015	X	X	X	X	
030A014	NWO-030-1002	REG	SD	27-Feb-07	0 - 0.5	703016-016	X	X	X	X	
Background											
030A015	NWO-030-5001	REG	SS	27-Feb-07	0 - 0.5	703017-001	X	X			
	NWO-030-5012	FD	SS	27-Feb-07	0 - 0.5	703017-012	X	X			
030A016	NWO-030-5002	REG	SS	26-Feb-07	0 - 0.5	703017-002	X	X			
030A017	NWO-030-5003	REG	SS	26-Feb-07	0 - 0.5	703017-003	X	X			
030A018	NWO-030-5004	REG	SS	26-Feb-07	0 - 0.5	703017-004	X	X			
030A019	NWO-030-5005	REG	SS	26-Feb-07	0 - 0.5	703017-005	X	X			
	NWO-030-5005-MS	MS	SS	26-Feb-07	0 - 0.5	703017-005-MS	X	X			
	NWO-030-5005-MSD	MSD	SS	26-Feb-07	0 - 0.5	703017-005-MSD	X	X			
030A020	NWO-030-5006	REG	SS	27-Feb-07	0 - 0.5	703017-006	X	X			
030A021	NWO-030-5007	REG	SS	26-Feb-07	0 - 0.5	703017-007	X	X			
030A022	NWO-030-5008	REG	SS	27-Feb-07	0 - 0.5	703017-008	X	X			
030A023	NWO-030-5009	REG	SS	27-Feb-07	0 - 0.5	703017-009	X	X			
030A024	NWO-030-5010	REG	SS	26-Feb-07	0 - 0.5	703017-010	X	X			
030A025	NWO-030-5011	REG	SD	26-Feb-07	0 - 0.5	703017-011	X	X			

Notes:

X - Indicates a sample was collected and analyzed for the given parameter

* Select metals are aluminum, chromium, copper, iron, lead, manganese, molybdenum, and nickel.

SDG - sample delivery group
REG - regular field sample
FD - field duplicate
MS - matrix spike
MSD - matrix spike duplicate
SS - surface soil (< 0.5ft bgs)
SD - sediment

Table G-2

Summary of Soil and Sediment Parent and Field Duplicate Results and RPD Calculations
Boardman Air Force Base

Location			030A006					030A008					030A015				
Sample Date			27-Feb-07					28-Feb-07					27-Feb-07				
Sample Number			NWO-030-1001		NWO-030-1003			NWO-030-0007		NWO-030-0013			NWO-030-5001		NWO-030-5012		
Sample Depth (bgs) (ft)			0.0 to 0.5		0.0 to 0.5			0.0 to 0.5		0.0 to 0.5			0.0 to 0.5		0.0 to 0.5		
Sample Purpose			REG		FD			REG		FD			REG		FD		
Fraction	Parameter	Units	Result	VQ	Result	VQ	RPD	Result	VQ	Result	VQ	RPD	Result	VQ	Result	VQ	RPD
Metals	Aluminum	mg/kg	8910		9310		4.4	7130		6900		3.3	10300		11000		6.6
Metals	Chromium	mg/kg	12.1		12.3		1.6	10.1		10.5		3.9	14.1		15		6.2
Metals	Copper	mg/kg	15		15.2		1.3	11		11		0.0	14.1		14.1		0.0
Metals	Iron	mg/kg	20400		20900		2.4	22900		21800		4.9	24400		24800		1.6
Metals	Lead	mg/kg	5.8		6.3		8.3	4.4		4.3		2.3	7.9		7.8		1.3
Metals	Manganese	mg/kg	219		213		2.8	343		326		5.1	481		474		1.5
Metals	Mercury	mg/kg	0.0092	J	0.009	J	2.2	0.0072	J	0.0045	J	46.2	< 0.017	U	< 0.013	U	NC
Metals	Molybdenum	mg/kg	< 0.31	U	< 0.3	U	NC	< 0.33	U	< 0.41	U	NC	0.34	J	0.3	J	12.5
Metals	Nickel	mg/kg	11.9		11.7		1.7	9.3		9.1		2.2	12.4		12.2		1.6
Explosives	1,3,5-Trinitrobenzene	mg/kg	< 0.012	U	< 0.012	U	NC	< 0.012	U	< 0.012	U	NC					
Explosives	1,3-Dinitrobenzene	mg/kg	< 0.002	U	< 0.002	U	NC	< 0.002	U	< 0.002	U	NC					
Explosives	2,4,6-Trinitrotoluene	mg/kg	< 0.008	U	< 0.008	U	NC	< 0.008	U	< 0.008	U	NC					
Explosives	2,4-Dinitrotoluene	mg/kg	< 0.014	U	< 0.014	U	NC	< 0.014	U	< 0.014	U	NC					
Explosives	2,6-Dinitrotoluene	mg/kg	< 0.007	U	< 0.007	U	NC	< 0.007	U	< 0.007	U	NC					
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	< 0.01	U	< 0.01	U	NC	< 0.01	U	< 0.01	U	NC					
Explosives	2-Nitrotoluene	mg/kg	< 0.009	U	< 0.009	U	NC	< 0.009	U	< 0.009	U	NC					
Explosives	3-Nitrotoluene	mg/kg	< 0.022	U	< 0.022	U	NC	< 0.022	U	< 0.022	U	NC					
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	< 0.006	U	< 0.006	U	NC	< 0.006	U	< 0.006	U	NC					
Explosives	4-Nitrotoluene	mg/kg	< 0.036	U	< 0.036	U	NC	< 0.036	U	< 0.036	U	NC					
Explosives	HMX	mg/kg	< 0.012	U	< 0.012	U	NC	< 0.012	U	< 0.012	U	NC					
Explosives	Nitrobenzene	mg/kg	< 0.006	U	< 0.006	U	NC	< 0.006	U	< 0.006	U	NC					
Explosives	Nitroglycerine	mg/kg	< 0.04	U	< 0.04	U	NC	< 0.04	U	< 0.04	U	NC					
Explosives	PETN	mg/kg						< 0.042	U	< 0.042	U	NC					
Explosives	RDX	mg/kg	< 0.071	U	< 0.071	U	NC	< 0.071	U	< 0.071	U	NC					
Explosives	Tetryl	mg/kg	< 0.004	U	< 0.004	U	NC	< 0.004	U	< 0.004	U	NC					

Notes:

bgs - below ground surface
ft - feet
mg/kg - milligram per kilogram
RPD - relative percent difference
NC - not calculated
VQ - validation qualifier

REG - regular sample
FD - field duplicate sample
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
PETN - pentaerythritol tetranitrate
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions

U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit

J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample

R - The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data, 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data, 3. The presence or absence of the constituent cannot be verified based on the data provided, 4. To indicate not to use a particular result in the event of a reanalysis

UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-3

Laboratory Qualifier and Data Validation Qualifier Definitions

Laboratory Qualifier Definitions

All Departments	
U	Indicates that the compound was analyzed for but not detected
BQL	Below Quantitation Limit
D	Indicates that the analyte was reported from a diluted analysis
Organics	
B	Indicates that the analyte was found in the associated blank as well as in the sample
E	Indicates that the concentration detected exceeded the calibration range of the instrument
J	Value is less than the reporting limit by greater than the MDL
P	Indicates that there is greater than 40% difference for detected explosive results between two columns
Metals	
J	Indicates that the reported value was less than the reporting limit but greater than or equal to the IDL/MDL
E	Indicates that the reported value is estimated because of the possible presence of interferences (i.e., the serial dilution not within control limits)
B	Indicates that the element was found in an associated blank above 2x the MDL and/or ½ RL of a ICB / CCB / ICSA
N	Spiked sample recovery not within control limits
*	Duplicate analysis not within control limits

Data Validation Qualifier Definitions

U	Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J	The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
R	The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data 3. The presence or absence of the constituent cannot be verified based on the data provided 4. To indicate not to use a particular result in the event of a reanalysis
UJ	The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-4

Data Validation Qualifier Reason Code Definitions

Reason Code	Definition
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Table G-5

Summary of Negatively Impacted Sample Results Associated with Adverse QC Criteria
Boardman Air Force Base

SDG	Sample Number	Sample Type	Fraction	Parameter	Result	Units	LQ	VQ	R1
703016	NWO-030-0001	SS	Metals	Molybdenum	0.32	mg/kg	JD	U	06B
703016	NWO-030-0002	SS	Metals	Molybdenum	0.28	mg/kg	JD	U	06B
703016	NWO-030-0003	SS	Metals	Molybdenum	0.3	mg/kg	JD	U	06B
703016	NWO-030-0004	SS	Metals	Molybdenum	0.32	mg/kg	JD	U	06B
703016	NWO-030-0005	SS	Metals	Molybdenum	0.3	mg/kg	JD	U	06B
703016	NWO-030-0006	SS	Metals	Molybdenum	0.36	mg/kg	JD	U	06B
703016	NWO-030-0007	SS	Metals	Molybdenum	0.33	mg/kg	JD	U	06B
703016	NWO-030-0009	SS	Metals	Molybdenum	0.25	mg/kg	JD	U	06B
703016	NWO-030-0010	SS	Metals	Molybdenum	0.27	mg/kg	JD	U	06B
703016	NWO-030-0011	SS	Metals	Molybdenum	0.32	mg/kg	JD	U	06B
703016	NWO-030-0012	SS	Metals	Molybdenum	0.43	mg/kg	JD	U	06B
703016	NWO-030-0013	SS	Metals	Molybdenum	0.41	mg/kg	JD	U	06B
703016	NWO-030-1001	SD	Metals	Molybdenum	0.31	mg/kg	JD	U	06B
703016	NWO-030-1002	SD	Metals	Molybdenum	0.34	mg/kg	JD	U	06B
703017	NWO-030-5001	SS	Metals	Mercury	0.017	mg/kg	J	U	06A
703017	NWO-030-5002	SS	Metals	Mercury	0.011	mg/kg	J	U	06A
703017	NWO-030-5005	SS	Metals	Mercury	0.019	mg/kg	J	U	06A
703017	NWO-030-5006	SS	Metals	Mercury	0.014	mg/kg	J	U	06A
703017	NWO-030-5007	SS	Metals	Mercury	0.012	mg/kg	J	U	06A
703017	NWO-030-5008	SS	Metals	Mercury	0.014	mg/kg	J	U	06A
703017	NWO-030-5009	SS	Metals	Mercury	0.022	mg/kg	J	U	06A
703017	NWO-030-5010	SS	Metals	Mercury	0.011	mg/kg	J	U	06A
703017	NWO-030-5011	SS	Metals	Mercury	0.014	mg/kg	J	U	06A
703017	NWO-030-5012	SS	Metals	Mercury	0.013	mg/kg	J	U	06A

SDG - sample delivery group
SS - surface soil
SD - sediment

* LQ - laboratory qualifier
* VQ - validation qualifier

** R1 - reason code no. 1

* See Table G-3 for laboratory and data validation qualifier definitions
** See Table G-4 for data validation reason code definitions

Table G-6a

Comparison of Target No. 1 Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A001			
Sample Date						27-Feb-07			
Sample Number						NWO-030-0001			
Sample Depth (bgs) (ft)						0 to 0.5			
Sample Purpose						REG			
Fraction	**Parameter**	**Units**	**Site Inspection Background 95th UTL / 95th Percentile**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35	< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*9110*	95.8	2.6	
Metals	Chromium	mg/kg	26.1	0.4	210	*13.5*	1.9	0.27	
Metals	Copper	mg/kg	33	50	3100	14.1	1.9	0.19	
Metals	Iron	mg/kg	36900	10	23000	*20800*	47.9	3.1	
Metals	Lead	mg/kg	17.7	16	400	5.6	1.9	0.076	
Metals	Manganese	mg/kg	880	No criteria	No criteria	202	1.9	0.055	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0048	0.037	0.0037	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.32	4.8	0.28	U
Metals	Nickel	mg/kg	20.3	30	1600	12.4	0.96	0.084	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions
U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
R - The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data, 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data, 3. The presence or absence of the constituent cannot be verified based on the data provided, 4. To indicate not to use a particular result in the event of a reanalysis
UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-6b

Comparison of Target No. 2 Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A002				030A003			
Sample Date						27-Feb-07				28-Feb-07			
Sample Number						NWO-030-0002				NWO-030-0003			
Sample Depth (bgs) (ft)						0 to 0.5				0 to 0.5			
Sample Purpose						REG				REG			
Fraction	**Parameter**	**Units**	**Site Inspection Background 95th UTL / 95th Percentile**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800	< 0.012	0.04	0.012	U	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1	< 0.002	0.04	0.002	U	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16	< 0.008	0.04	0.008	U	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72	< 0.014	0.04	0.014	U	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72	< 0.007	0.04	0.007	U	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12	< 0.01	0.04	0.01	U	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88	< 0.009	0.08	0.009	U	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730	< 0.022	0.08	0.022	U	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12	< 0.036	0.08	0.036	U	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100	< 0.012	0.08	0.012	U	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35	< 0.04	4	0.04	U	< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4	< 0.071	0.08	0.071	U	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610	< 0.004	0.08	0.004	U	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*6690*	85.3	2.3		*6400*	87.2	2.4	
Metals	Chromium	mg/kg	26.1	0.4	210	*10.2*	1.7	0.24		*10.2*	1.7	0.24	
Metals	Copper	mg/kg	33	50	3100	10	1.7	0.17		8.4	1.7	0.17	
Metals	Iron	mg/kg	36900	10	23000	*19200*	42.7	2.7		*19200*	43.6	2.8	
Metals	Lead	mg/kg	17.7	16	400	4.7	1.7	0.067		3.9	1.7	0.069	
Metals	Manganese	mg/kg	880	No criteria	No criteria	358	1.7	0.049		399	1.7	0.05	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0051	0.031	0.0031	J	0.0057	0.033	0.0033	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.28	4.3	0.25	U	< 0.3	4.4	0.25	U
Metals	Nickel	mg/kg	20.3	30	1600	9.7	0.85	0.075		8.5	0.87	0.077	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
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HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
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Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions
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UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-6c

Comparison of Carty Reservoir Bomb Target Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A004				030A005			
Sample Date						27-Feb-07				26-Feb-07			
Sample Number						NWO-030-0004				NWO-030-0005			
Sample Depth (bgs) (ft)						0 to 0.5				0 to 0.5			
Sample Purpose						REG				REG			
Fraction	**Parameter**	**Units**	**Site Inspection Background 95th UTL / 95th Percentile**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**		**VQ**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800					< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1					< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16					< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72					< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72					< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12					< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88					< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730					< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12					< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12					< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100					< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria					< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35					< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4					< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610					< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*8450*	93.7	2.5		*8540*	86.7	2.3	
Metals	Chromium	mg/kg	26.1	0.4	210	*11.3*	1.9	0.26		*12.5*	1.7	0.24	
Metals	Copper	mg/kg	33	50	3100	12.9	1.9	0.19		13	1.7	0.17	
Metals	Iron	mg/kg	36900	10	23000	*20700*	46.9	3		*20400*	43.4	2.8	
Metals	Lead	mg/kg	17.7	16	400	5.5	1.9	0.074		6.2	1.7	0.069	
Metals	Manganese	mg/kg	880	No criteria	No criteria	317	1.9	0.053		347	1.7	0.049	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0056	0.034	0.0034	J	0.0065	0.033	0.0033	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.32	4.7	0.27	U	< 0.3	4.3	0.25	U
Metals	Nickel	mg/kg	20.3	30	1600	11.7	0.94	0.082		12.3	0.87	0.076	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions
U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
R - The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data, 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data, 3. The presence or absence of the constituent cannot be verified based on the data provided, 4. To indicate not to use a particular result in the event of a reanalysis
UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-6d

Comparison of Range Complex No. 1, Demolition Area Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A007				030A008				030A008			
Sample Date						28-Feb-07				28-Feb-07				28-Feb-07			
Sample Number						NWO-030-0006				NWO-030-0007				NWO-030-0013			
Sample Depth (bgs) (ft)						0 to 0.5				0 to 0.5				0 to 0.5			
Sample Purpose						REG				REG				FD			
Fraction	Parameter	Units	Site Inspection Background 95th UTL / 95th Percentile	Site Inspection Ecological Screening Level	USEPA Region 9 PRGs - Residential Soil	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800	< 0.012	0.04	0.012	U	< 0.012	0.04	0.012	U	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1	< 0.002	0.04	0.002	U	< 0.002	0.04	0.002	U	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16	< 0.008	0.04	0.008	U	< 0.008	0.04	0.008	U	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72	< 0.014	0.04	0.014	U	< 0.014	0.04	0.014	U	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72	< 0.007	0.04	0.007	U	< 0.007	0.04	0.007	U	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12	< 0.01	0.04	0.01	U	< 0.01	0.04	0.01	U	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88	< 0.009	0.08	0.009	U	< 0.009	0.08	0.009	U	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730	< 0.022	0.08	0.022	U	< 0.022	0.08	0.022	U	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12	< 0.036	0.08	0.036	U	< 0.036	0.08	0.036	U	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100	< 0.012	0.08	0.012	U	< 0.012	0.08	0.012	U	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35	< 0.04	4	0.04	U	< 0.04	4	0.04	U	< 0.04	4	0.04	U
Explosives	PETN	mg/kg	No criteria	8600	0.5	< 0.042	0.2	0.042	U	< 0.042	0.2	0.042	U	< 0.042	0.2	0.042	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4	< 0.071	0.08	0.071	U	< 0.071	0.08	0.071	U	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610	< 0.004	0.08	0.004	U	< 0.004	0.08	0.004	U	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*5380*	77.3	2.1		*7130*	83.4	2.3		*6900*	86.6	2.3	
Metals	Chromium	mg/kg	26.1	0.4	210	*8.2*	1.5	0.22		*10.1*	1.7	0.23		*10.5*	1.7	0.24	
Metals	Copper	mg/kg	33	50	3100	20	1.5	0.15		11	1.7	0.17		11	1.7	0.17	
Metals	Iron	mg/kg	36900	10	23000	*22000*	38.7	2.5		*22900*	41.7	2.7		*21800*	43.3	2.8	
Metals	Lead	mg/kg	17.7	16	400	15.3	1.5	0.061		4.4	1.7	0.066		4.3	1.7	0.068	
Metals	Manganese	mg/kg	880	No criteria	No criteria	318	1.5	0.044		343	1.7	0.048		326	1.7	0.049	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0042	0.03	0.003	J	0.0072	0.034	0.0034	J	0.0045	0.033	0.0033	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.36	3.9	0.22	U	< 0.33	4.2	0.24	U	< 0.41	4.3	0.25	U
Metals	Nickel	mg/kg	20.3	30	1600	8.7	0.77	0.068		9.3	0.83	0.073		9.1	0.87	0.076	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
PETN - pentaerythritol tetranitrate
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions
U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
R - The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data, 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data, 3. The presence or absence of the constituent cannot be verified based on the data provided, 4. To indicate not to use a particular result in the event of a reanalysis
UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-6e

Comparison of Range Complex No. 1, Turret Gunnery Range Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A009				030A010			
Sample Date						26-Feb-07				27-Feb-07			
Sample Number						NWO-030-0008				NWO-030-0009			
Sample Depth (bgs) (ft)						0 to 0.5				0 to 0.5			
Sample Purpose						REG				REG			
Fraction	**Parameter**	**Units**	**Site Inspection Background 95th UTL / 95th Percentile**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**
Metals	Aluminum	mg/kg	21900	50	76000	*6530*	86.7	2.3		*6490*	79.4	2.1	
Metals	Chromium	mg/kg	26.1	0.4	210	*11.4*	1.7	0.24		*10.3*	1.6	0.22	
Metals	Copper	mg/kg	33	50	3100	9.1	1.7	0.17		8.1	1.6	0.16	
Metals	Iron	mg/kg	36900	10	23000	*17300*	43.4	2.8		*17200*	39.7	2.5	
Metals	Lead	mg/kg	17.7	16	400	4.7	1.7	0.069		3.9	1.6	0.063	
Metals	Manganese	mg/kg	880	No criteria	No criteria	306	1.7	0.049		316	1.6	0.045	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0069	0.031	0.0031	J	0.0046	0.032	0.0032	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.25	4.3	0.25	U	< 0.25	4	0.23	U
Metals	Nickel	mg/kg	20.3	30	1600	9.8	0.87	0.076		8.7	0.79	0.07	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier
REG - regular sample
FD - field duplicate

Validation Qualifier Definitions
U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
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UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-6f

Comparison of Demolition Area No. 2 Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A011				030A012			
Sample Date						27-Feb-07				27-Feb-07			
Sample Number						NWO-030-0010				NWO-030-0011			
Sample Depth (bgs) (ft)						0 to 0.5				0 to 0.5			
Sample Purpose						REG				REG			
Fraction	Parameter	Units	Site Inspection Background 95th UTL / 95th Percentile	Site Inspection Ecological Screening Level	USEPA Region 9 PRGs - Residential Soil	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800	< 0.012	0.04	0.012	U	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1	< 0.002	0.04	0.002	U	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16	< 0.008	0.04	0.008	U	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72	< 0.014	0.04	0.014	U	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72	< 0.007	0.04	0.007	U	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12	< 0.01	0.04	0.01	U	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88	< 0.009	0.08	0.009	U	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730	< 0.022	0.08	0.022	U	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12	< 0.036	0.08	0.036	U	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100	< 0.012	0.08	0.012	U	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35	< 0.04	4	0.04	U	< 0.04	4	0.04	U
Explosives	PETN	mg/kg	No criteria	8600	0.5	< 0.042	0.2	0.042	U	< 0.042	0.2	0.042	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4	< 0.071	0.08	0.071	U	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610	< 0.004	0.08	0.004	U	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*6620*	87	2.3		*8330*	81.9	2.2	
Metals	Chromium	mg/kg	26.1	0.4	210	*10.7*	1.7	0.24		*12.9*	1.6	0.23	
Metals	Copper	mg/kg	33	50	3100	11.2	1.7	0.17		15.7	1.6	0.16	
Metals	Iron	mg/kg	36900	10	23000	*17100*	43.5	2.8		*22100*	41	2.6	
Metals	Lead	mg/kg	17.7	16	400	6.4	1.7	0.069		6.7	1.6	0.065	
Metals	Manganese	mg/kg	880	No criteria	No criteria	296	1.7	0.05		362	1.6	0.047	
Metals	Mercury	mg/kg	0.036	0.1	23	0.0065	0.032	0.0032	J	0.0064	0.031	0.0031	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.27	4.3	0.25	U	< 0.32	4.1	0.24	U
Metals	Nickel	mg/kg	20.3	30	1600	9	0.87	0.077		11.5	0.82	0.072	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
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mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
PETN - pentaerythritol tetranitrate
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

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Table G-6g

Comparison of Impact Area Soil Results to Site Inspection Screening Levels
Boardman Air Force Base

Location						030A013			
Sample Date						27-Feb-07			
Sample Number						NWO-030-0012			
Sample Depth (bgs) (ft)						0 to 0.5			
Sample Purpose						REG			
Fraction	**Parameter**	**Units**	**Site Inspection Background 95th UTL / 95th Percentile**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	0.376	1800	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	0.655	6.1	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	6.4	16	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	1.28	0.72	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	0.0328	0.72	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	2.1	12	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	2	0.88	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	2.4	730	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	0.73	12	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	4.4	12	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	27	3100	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	71	35	< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	7.5	4.4	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	0.99	610	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	21900	50	76000	*13400*	93.5	2.5	
Metals	Chromium	mg/kg	26.1	0.4	210	*17.5*	1.9	0.26	
Metals	Copper	mg/kg	33	50	3100	18.9	1.9	0.19	
Metals	Iron	mg/kg	36900	10	23000	*29100*	46.7	3	
Metals	Lead	mg/kg	17.7	16	400	11.8	1.9	0.074	
Metals	Manganese	mg/kg	880	No criteria	No criteria	556	1.9	0.053	
Metals	Mercury	mg/kg	0.036	0.1	23	0.013	0.035	0.0035	J
Metals	Molybdenum	mg/kg	0.44	2	390	< 0.43	4.7	0.27	U
Metals	Nickel	mg/kg	20.3	30	1600	15	0.93	0.082	

Notes:
[**Bold**] - Result exceeds Site Inspection Background 95th UTL / 95th Percentile
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[Underline] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
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PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

Validation Qualifier Definitions
U - Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit
J - The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed
R - The reported sample results are rejected due to the following: 1. Severe deficiencies in the supporting quality control data, 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data, 3. The presence or absence of the constituent cannot be verified based on the data provided, 4. To indicate not to use a particular result in the event of a reanalysis
UJ - The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the reporting limit may be inaccurate or imprecise. The nondetect result should be estimated

Table G-7a

Comparison of Carty Reservoir Bomb Target Sediment Results to Site Inspection Screening Values
Boardman Air Force Base

Location							030A006				030A006			
Sample Date							27-Feb-07				27-Feb-07			
Sample Number							NWO-030-1001				NWO-030-1003			
Sample Depth (bgs) (ft)							0 to 0.5				0 to 0.5			
Sample Purpose							REG				FD			
Fraction	**Parameter**	**Units**	**Maximum Concentration from Media Background Sample**	**"3x" Maximum Concentration from Media Background Sample**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	No criteria	0.024	1800	< 0.012	0.04	0.012	U	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	No criteria	0.067	6.1	< 0.002	0.04	0.002	U	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	No criteria	0.92	16	< 0.008	0.04	0.008	U	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	No criteria	0.29	0.72	< 0.014	0.04	0.014	U	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	No criteria	1.9	0.72	< 0.007	0.04	0.007	U	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	No criteria	7	12	< 0.01	0.04	0.01	U	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	No criteria	5.6	0.88	< 0.009	0.08	0.009	U	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	No criteria	4.9	730	< 0.022	0.08	0.022	U	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	No criteria	1.9	12	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	No criteria	10	12	< 0.036	0.08	0.036	U	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	No criteria	0.047	3100	< 0.012	0.08	0.012	U	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	No criteria	1700	35	< 0.04	4	0.04	U	< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	No criteria	0.13	4.4	< 0.071	0.08	0.071	U	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	No criteria	100	610	< 0.004	0.08	0.004	U	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	10500	31500	280	76000	*8910*	98.1	2.6		*9310*	102	2.8	
Metals	Chromium	mg/kg	13.2	39.6	37	210	12.1	2	0.27		12.3	2	0.29	
Metals	Copper	mg/kg	13.6	40.8	10	3100	*15*	2	0.2		*15.2*	2	0.2	
Metals	Iron	mg/kg	22400	67200	20	23000	*20400*	49	3.1		*20900*	51.1	3.3	
Metals	Lead	mg/kg	7.1	21.3	35	400	5.8	2	0.077		6.3	2	0.081	
Metals	Manganese	mg/kg	429	1287	No criteria	No criteria	219	2	0.056		213	2	0.058	
Metals	Mercury	mg/kg	.014	.042	0.2	23	0.0092	0.038	0.0038	J	0.009	0.038	0.0038	J
Metals	Molybdenum	mg/kg	.31	.93	No criteria	390	< 0.31	4.9	0.28	U	< 0.3	5.1	0.3	U
Metals	Nickel	mg/kg	10.9	32.7	18	1600	11.9	0.98	0.086		11.7	1	0.09	

Notes:
[**Bold Face**] - Result exceeds "3x" Maximum Concentration from Media Background Sample
[*Italicized*] - Result exceeds Site Inspection Ecological Screening Level
[UNDERLINED] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

REG - regular sample
FD - field duplicate
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
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Table G-7b

Comparison of Impact Area Sediment Results to Site Inspection Screening Values
Boardman Air Force Base

Location							030A014			
Sample Date							27-Feb-07			
Sample Number							NWO-030-1002			
Sample Depth (bgs) (ft)							0 to 0.5			
Sample Purpose							REG			
Fraction	**Parameter**	**Units**	**Maximum Concentration from Media Background Sample**	**"3x" Maximum Concentration from Media Background Sample**	**Site Inspection Ecological Screening Level**	**USEPA Region 9 PRGs - Residential Soil**	**Result**	**PQL**	**MDL**	**VQ**
Explosives	1,3,5-Trinitrobenzene	mg/kg	No criteria	No criteria	0.024	1800	< 0.012	0.04	0.012	U
Explosives	1,3-Dinitrobenzene	mg/kg	No criteria	No criteria	0.067	6.1	< 0.002	0.04	0.002	U
Explosives	2,4,6-Trinitrotoluene	mg/kg	No criteria	No criteria	0.92	16	< 0.008	0.04	0.008	U
Explosives	2,4-Dinitrotoluene	mg/kg	No criteria	No criteria	0.29	0.72	< 0.014	0.04	0.014	U
Explosives	2,6-Dinitrotoluene	mg/kg	No criteria	No criteria	1.9	0.72	< 0.007	0.04	0.007	U
Explosives	2-Amino-4,6-dinitrotoluene	mg/kg	No criteria	No criteria	7	12	< 0.01	0.04	0.01	U
Explosives	2-Nitrotoluene	mg/kg	No criteria	No criteria	5.6	0.88	< 0.009	0.08	0.009	U
Explosives	3-Nitrotoluene	mg/kg	No criteria	No criteria	4.9	730	< 0.022	0.08	0.022	U
Explosives	4-Amino-2,6-dinitrotoluene	mg/kg	No criteria	No criteria	1.9	12	< 0.006	0.04	0.006	U
Explosives	4-Nitrotoluene	mg/kg	No criteria	No criteria	10	12	< 0.036	0.08	0.036	U
Explosives	HMX	mg/kg	No criteria	No criteria	0.047	3100	< 0.012	0.08	0.012	U
Explosives	Nitrobenzene	mg/kg	No criteria	No criteria	No criteria	No criteria	< 0.006	0.04	0.006	U
Explosives	Nitroglycerine	mg/kg	No criteria	No criteria	1700	35	< 0.04	4	0.04	U
Explosives	RDX	mg/kg	No criteria	No criteria	0.13	4.4	< 0.071	0.08	0.071	U
Explosives	Tetryl	mg/kg	No criteria	No criteria	100	610	< 0.004	0.08	0.004	U
Metals	Aluminum	mg/kg	10500	31500	280	76000	*11900*	95.8	2.6	
Metals	Chromium	mg/kg	13.2	39.6	37	210	15	1.9	0.27	
Metals	Copper	mg/kg	13.6	40.8	10	3100	*15.7*	1.9	0.19	
Metals	Iron	mg/kg	22400	67200	20	23000	*23800*	47.9	3.1	
Metals	Lead	mg/kg	7.1	21.3	35	400	8.1	1.9	0.076	
Metals	Manganese	mg/kg	429	1287	No criteria	No criteria	476	1.9	0.055	
Metals	Mercury	mg/kg	.014	.042	0.2	23	0.013	0.035	0.0035	J
Metals	Molybdenum	mg/kg	.31	.93	No criteria	390	< 0.34	4.8	0.28	U
Metals	Nickel	mg/kg	10.9	32.7	18	1600	12.7	0.96	0.084	

Notes:
[**Bold Face**] - Result exceeds "3x" Maximum Concentration from Media Background Sample
[*talicized*] - Result exceeds Site Inspection Ecological Screening Level
[UNDERLINED] - Result exceeds EPA Region 9 PRG - Residential Soil

bgs - below ground surface
ft - feet
USEPA - United States Environmenal Protection Agency
PRG - Preliminary Remediation Goal
PQL - practical quantitation limit
MDL - method detection limit
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VQ - validation qualifier

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HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
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Table G-8a

Background Soil Results
Boardman Air Force Base

Location			030A015				030A015				030A016				030A017				030A018			
Sample Date			27-Feb-07				27-Feb-07				26-Feb-07				26-Feb-07				26-Feb-07			
Sample Number			NWO-030-5001				NWO-030-5012				NWO-030-5002				NWO-030-5003				NWO-030-5004			
Sample Depth (bgs) (ft)			0 to 0.5				0 to 0.5				0 to 0.5				0 to 0.5				0 to 0.5			
Sample Purpose			REG				FD				REG				REG				REG			
Fraction	**Parameter**	**Units**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**	**Result**	**PQL**	**MDL**	**VQ**
Metals	Aluminum	mg/kg	10300	89.3	2.4		11000	87.2	2.4		8820	81.2	2.2		9800	79.4	2.1		18000	98.2	2.7	
Metals	Chromium	mg/kg	14.1	1.8	0.25		15	1.7	0.24		10.1	1.6	0.23		13	1.6	0.22		21.5	2	0.27	
Metals	Copper	mg/kg	14.1	1.8	0.18		14.1	1.7	0.17		14	1.6	0.16		14.3	1.6	0.16		26.5	2	0.2	
Metals	Iron	mg/kg	24400	44.6	2.9		24800	43.6	2.8		20600	40.6	2.6		22600	39.7	2.5		31100	49.1	3.1	
Metals	Lead	mg/kg	7.9	1.8	0.071		7.8	1.7	0.069		7.3	1.6	0.064		8.1	1.6	0.063		13.7	2	0.078	
Metals	Manganese	mg/kg	481	1.8	0.051		474	1.7	0.05		392	1.6	0.046		435	1.6	0.045		660	2	0.056	
Metals	Mercury	mg/kg	< 0.017	0.036	0.0036	U	< 0.013	0.035	0.0035	U	< 0.011	0.033	0.0033	U	0.032	0.033	0.0033	J	0.027	0.036	0.0036	J
Metals	Molybdenum	mg/kg	0.34	4.5	0.26	J	0.3	4.4	0.25	J	0.26	4.1	0.24	J	0.29	4	0.23	J	**0.5**	4.9	0.28	J
Metals	Nickel	mg/kg	12.4	0.89	0.079		12.2	0.87	0.077		11.8	0.81	0.071		12.4	0.79	0.07		17.9	0.98	0.086	

Notes:
bgs - below ground surface
ft - feet
PQL - practical quantitation limit
MDL - method detection limit
mg/kg - milligram per kilogram
VQ - validation qualifier

Validation Qualifier Definitions
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Table G-8a

Background Soil Results
Boardman Air Force Base

Location			030A019				030A020				030A021				030A022				030A023			
Sample Date			26-Feb-07				27-Feb-07				26-Feb-07				27-Feb-07				27-Feb-07			
Sample Number			NWO-030-5005				NWO-030-5006				NWO-030-5007				NWO-030-5008				NWO-030-5009			
Sample Depth (bgs) (ft)			0 to 0.5				0 to 0.5				0 to 0.5				0 to 0.5				0 to 0.5			
Sample Purpose			REG				REG				REG				REG				REG			
Fraction	Parameter	Units	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ	Result	PQL	MDL	VQ
Metals	Aluminum	mg/kg	11600	88.9	2.4		9810	82.8	2.2		7380	77.9	2.1		9890	80.2	2.2		13400	87.2	2.4	
Metals	Chromium	mg/kg	15.1	1.8	0.25		15.3	1.7	0.23		11.6	1.6	0.22		13	1.6	0.22		16.8	1.7	0.24	
Metals	Copper	mg/kg	18.4	1.8	0.18		12.6	1.7	0.17		9.7	1.6	0.16		14.3	1.6	0.16		17.7	1.7	0.17	
Metals	Iron	mg/kg	26100	44.5	2.8		20700	41.4	2.6		19300	39	2.5		21600	40.1	2.6		27900	43.6	2.8	
Metals	Lead	mg/kg	9.7	1.8	0.07		7.5	1.7	0.065		5.6	1.6	0.062		7	1.6	0.063		10.3	1.7	0.069	
Metals	Manganese	mg/kg	502	1.8	0.051		365	1.7	0.047		342	1.6	0.044		380	1.6	0.046		596	1.7	0.05	
Metals	Mercury	mg/kg	< 0.019	0.035	0.0035	U	< 0.014	0.034	0.0034	U	< 0.012	0.033	0.0033	U	< 0.014	0.034	0.0034	U	< 0.022	0.034	0.0034	U
Metals	Molybdenum	mg/kg	0.31	4.4	0.26	J	0.29	4.1	0.24	J	0.29	3.9	0.23	J	< 0.23	4	0.23	U	0.31	4.4	0.25	J
Metals	Nickel	mg/kg	14.1	0.89	0.078		12.3	0.83	0.073		9.8	0.78	0.069		12.6	0.8	0.071		14.3	0.87	0.077	

Notes:
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Table G-8a

Background Soil Results
Boardman Air Force Base

Location			030A024			
Sample Date			26-Feb-07			
Sample Number			NWO-030-5010			
Sample Depth (bgs) (ft)			0 to 0.5			
Sample Purpose			REG			
Fraction	**Parameter**	**Units**	**Result**	**PQL**	**MDL**	**VQ**
Metals	Aluminum	mg/kg	8100	80.3	2.2	
Metals	Chromium	mg/kg	11.4	1.6	0.22	
Metals	Copper	mg/kg	11.7	1.6	0.16	
Metals	Iron	mg/kg	19500	40.1	2.6	
Metals	Lead	mg/kg	5.6	1.6	0.063	
Metals	Manganese	mg/kg	314	1.6	0.046	
Metals	Mercury	mg/kg	< 0.011	0.034	0.0034	U
Metals	Molybdenum	mg/kg	0.27	4	0.23	J
Metals	Nickel	mg/kg	11.3	0.8	0.071	

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Table G-8b

Background Sediment Results
Boardman Air Force Base

Location			030A025			
Sample Date			26-Feb-07			
Sample Number			NWO-030-5011			
Sample Depth (bgs) (ft)			0 to 0.5			
Sample Purpose			REG			
Fraction	**Parameter**	**Units**	**Result**	**PQL**	**MDL**	**VQ**
Metals	Aluminum	mg/kg	10500	82.1	2.2	
Metals	Chromium	mg/kg	13.2	1.6	0.23	
Metals	Copper	mg/kg	13.6	1.6	0.16	
Metals	Iron	mg/kg	22400	41.1	2.6	
Metals	Lead	mg/kg	7.1	1.6	0.065	
Metals	Manganese	mg/kg	429	1.6	0.047	
Metals	Mercury	mg/kg	< 0.014	0.035	0.0035	U
Metals	Molybdenum	mg/kg	0.31	4.1	0.24	J
Metals	Nickel	mg/kg	10.9	0.82	0.072	

Notes:
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mg/kg - milligram per kilogram
PQL - practical quantitation limit
MDL - method detection limit
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ATTACHMENT 1

Summary of Analytical Results

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9110	95.8	2.6	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13.5	1.9	0.27	mg/kg	D			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.1	1.9	0.19	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20800	47.9	3.1	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.9	0.076	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	202	1.9	0.055	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0048	0.037	0.0037	mg/kg	J	J	15	N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.8	0.28	mg/kg	JD	U	06B	N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.96	0.084	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6690	85.3	2.3	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.2	1.7	0.24	mg/kg	D			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	10	1.7	0.17	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19200	42.7	2.7	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.7	1.7	0.067	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	358	1.7	0.049	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0051	0.031	0.0031	mg/kg	J	J	15	N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.28	4.3	0.25	mg/kg	JD	U	06B	N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.7	0.85	0.075	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6400	87.2	2.4	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.2	1.7	0.24	mg/kg	D			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	8.4	1.7	0.17	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19200	43.6	2.8	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	3.9	1.7	0.069	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	399	1.7	0.05	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0057	0.033	0.0033	mg/kg	J	J	15	N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.3	4.4	0.25	mg/kg	JD	U	06B	N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.5	0.87	0.077	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8450	93.7	2.5	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.3	1.9	0.26	mg/kg	D			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	12.9	1.9	0.19	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20700	46.9	3	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.5	1.9	0.074	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	317	1.9	0.053	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0056	0.034	0.0034	mg/kg	J	J	15	N	1
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.7	0.27	mg/kg	JD	U	06B	N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.7	0.94	0.082	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8540	86.7	2.3	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	12.5	1.7	0.24	mg/kg	D			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	13	1.7	0.17	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20400	43.4	2.8	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.2	1.7	0.069	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	347	1.7	0.049	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0065	0.033	0.0033	mg/kg	J	J	15	N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.3	4.3	0.25	mg/kg	JD	U	06B	N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.3	0.87	0.076	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	78-11-5	PETN	0.042	0.2	0.042	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	5380	77.3	2.1	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	8.2	1.5	0.22	mg/kg	D			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	20	1.5	0.15	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22000	38.7	2.5	mg/kg	D			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	15.3	1.5	0.061	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	318	1.5	0.044	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0042	0.03	0.003	mg/kg	J	J	15	N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.36	3.9	0.22	mg/kg	JD	U	06B	N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.7	0.77	0.068	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	78-11-5	PETN	0.042	0.2	0.042	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	7130	83.4	2.3	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.1	1.7	0.23	mg/kg	D			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11	1.7	0.17	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22900	41.7	2.7	mg/kg	D			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.4	1.7	0.066	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	343	1.7	0.048	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0072	0.034	0.0034	mg/kg	J	J	15	N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.33	4.2	0.24	mg/kg	JD	U	06B	N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.3	0.83	0.073	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6530	86.7	2.3	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.4	1.7	0.24	mg/kg	D			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	9.1	1.7	0.17	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17300	43.4	2.8	mg/kg	D			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.7	1.7	0.069	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	306	1.7	0.049	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0069	0.031	0.0031	mg/kg	J	J	15	N	1
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.25	4.3	0.25	mg/kg	UD	U		N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.8	0.87	0.076	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6490	79.4	2.1	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.3	1.6	0.22	mg/kg	D			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	8.1	1.6	0.16	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17200	39.7	2.5	mg/kg	D			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	3.9	1.6	0.063	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	316	1.6	0.045	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0046	0.032	0.0032	mg/kg	J	J	15	N	1
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.25	4	0.23	mg/kg	JD	U	06B	N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.7	0.79	0.07	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	78-11-5	PETN	0.042	0.2	0.042	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6620	87	2.3	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.7	1.7	0.24	mg/kg	D			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11.2	1.7	0.17	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17100	43.5	2.8	mg/kg	D			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.4	1.7	0.069	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	296	1.7	0.05	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0065	0.032	0.0032	mg/kg	J	J	15	N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.27	4.3	0.25	mg/kg	JD	U	06B	N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9	0.87	0.077	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	78-11-5	PETN	0.042	0.2	0.042	mg/kg	U	U		N	1

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8330	81.9	2.2	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	12.9	1.6	0.23	mg/kg	D			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	15.7	1.6	0.16	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22100	41	2.6	mg/kg	D			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.7	1.6	0.065	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	362	1.6	0.047	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0064	0.031	0.0031	mg/kg	J	J	15	N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.1	0.24	mg/kg	JD	U	06B	N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.5	0.82	0.072	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	13400	93.5	2.5	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	17.5	1.9	0.26	mg/kg	D			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	18.9	1.9	0.19	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	29100	46.7	3	mg/kg	D			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	11.8	1.9	0.074	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	556	1.9	0.053	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	J	15	N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.43	4.7	0.27	mg/kg	JD	U	06B	N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	15	0.93	0.082	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	78-11-5	PETN	0.042	0.2	0.042	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7429-90-5	Aluminum	6900	86.6	2.3	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-47-3	Chromium	10.5	1.7	0.24	mg/kg	D			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-50-8	Copper	11	1.7	0.17	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-89-6	Iron	21800	43.3	2.8	mg/kg	D			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-92-1	Lead	4.3	1.7	0.068	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-96-5	Manganese	326	1.7	0.049	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-97-6	Mercury	0.0045	0.033	0.0033	mg/kg	J	J	15	N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-98-7	Molybdenum	0.41	4.3	0.25	mg/kg	JD	U	06B	N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-02-0	Nickel	9.1	0.87	0.076	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	8910	98.1	2.6	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	12.1	2	0.27	mg/kg	D			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	15	2	0.2	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	20400	49	3.1	mg/kg	D			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	5.8	2	0.077	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	219	2	0.056	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.0092	0.038	0.0038	mg/kg	J	J	15	N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.9	0.28	mg/kg	JD	U	06B	N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	11.9	0.98	0.086	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	11900	95.8	2.6	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	15	1.9	0.27	mg/kg	D			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	15.7	1.9	0.19	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	23800	47.9	3.1	mg/kg	D			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	8.1	1.9	0.076	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	476	1.9	0.055	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	J	15	N	1

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.34	4.8	0.28	mg/kg	JD	U	06B	N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	12.7	0.96	0.084	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	99-35-4	1,3,5-Trinitrobenzene	0.012	0.04	0.012	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	99-65-0	1,3-Dinitrobenzene	0.002	0.04	0.002	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	118-96-7	2,4,6-Trinitrotoluene	0.008	0.04	0.008	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	121-14-2	2,4-Dinitrotoluene	0.014	0.04	0.014	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	606-20-2	2,6-Dinitrotoluene	0.007	0.04	0.007	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	0.01	0.04	0.01	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	88-72-2	2-Nitrotoluene	0.009	0.08	0.009	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	99-08-1	3-Nitrotoluene	0.022	0.08	0.022	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	99-99-0	4-Nitrotoluene	0.036	0.08	0.036	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	2691-41-0	HMX	0.012	0.08	0.012	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	98-95-3	Nitrobenzene	0.006	0.04	0.006	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	55-63-0	Nitroglycerine	0.04	4	0.04	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	121-82-4	RDX	0.071	0.08	0.071	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Explosives	479-45-8	Tetryl	0.004	0.08	0.004	mg/kg	U	U		N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7429-90-5	Aluminum	9310	102	2.8	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-47-3	Chromium	12.3	2	0.29	mg/kg	D			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-50-8	Copper	15.2	2	0.2	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-89-6	Iron	20900	51.1	3.3	mg/kg	D			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-92-1	Lead	6.3	2	0.081	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-96-5	Manganese	213	2	0.058	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-97-6	Mercury	0.009	0.038	0.0038	mg/kg	J	J	15	N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-98-7	Molybdenum	0.3	5.1	0.3	mg/kg	UD	U		N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-02-0	Nickel	11.7	1	0.09	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	10300	89.3	2.4	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	14.1	1.8	0.25	mg/kg	ED			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.1	1.8	0.18	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	24400	44.6	2.9	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.9	1.8	0.071	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	481	1.8	0.051	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.017	0.036	0.0036	mg/kg	J	U	06A	N	1
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.34	4.5	0.26	mg/kg	JD	J	15	N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.89	0.079	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8820	81.2	2.2	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.1	1.6	0.23	mg/kg	ED			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14	1.6	0.16	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20600	40.6	2.6	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.3	1.6	0.064	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	392	1.6	0.046	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.011	0.033	0.0033	mg/kg	J	U	06A	N	1
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.26	4.1	0.24	mg/kg	JD	J	15	N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.8	0.81	0.071	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9800	79.4	2.1	mg/kg	D			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13	1.6	0.22	mg/kg	ED			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.3	1.6	0.16	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22600	39.7	2.5	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	8.1	1.6	0.063	mg/kg	D			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	435	1.6	0.045	mg/kg	D			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.032	0.033	0.0033	mg/kg	J	J	15	N	1
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	4	0.23	mg/kg	JD	J	15	N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.79	0.07	mg/kg	DB			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	18000	98.2	2.7	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	21.5	2	0.27	mg/kg	ED			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	26.5	2	0.2	mg/kg	DB			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	31100	49.1	3.1	mg/kg	DB			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	13.7	2	0.078	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	660	2	0.056	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.027	0.036	0.0036	mg/kg	J	J	15	N	1
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.5	4.9	0.28	mg/kg	JD	J	15	N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	17.9	0.98	0.086	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	11600	88.9	2.4	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	15.1	1.8	0.25	mg/kg	ED			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	18.4	1.8	0.18	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	26100	44.5	2.8	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	9.7	1.8	0.07	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	502	1.8	0.051	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.019	0.035	0.0035	mg/kg	J	U	06A	N	1
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.4	0.26	mg/kg	JD	J	15	N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	14.1	0.89	0.078	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9810	82.8	2.2	mg/kg	D			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	15.3	1.7	0.23	mg/kg	ED			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	12.6	1.7	0.17	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20700	41.4	2.6	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.5	1.7	0.065	mg/kg	D			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	365	1.7	0.047	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.034	0.0034	mg/kg	J	U	06A	N	1
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	4.1	0.24	mg/kg	JD	J	15	N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.3	0.83	0.073	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	7380	77.9	2.1	mg/kg	D			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.6	1.6	0.22	mg/kg	ED			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	9.7	1.6	0.16	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19300	39	2.5	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.6	0.062	mg/kg	D			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	342	1.6	0.044	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.012	0.033	0.0033	mg/kg	J	U	06A	N	1
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	3.9	0.23	mg/kg	JD	J	15	N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.8	0.78	0.069	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9890	80.2	2.2	mg/kg	D			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13	1.6	0.22	mg/kg	ED			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.3	1.6	0.16	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	21600	40.1	2.6	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7	1.6	0.063	mg/kg	D			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	380	1.6	0.046	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.034	0.0034	mg/kg	J	U	06A	N	1
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.23	4	0.23	mg/kg	UD	U		N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.6	0.8	0.071	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	13400	87.2	2.4	mg/kg	D			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	16.8	1.7	0.24	mg/kg	ED			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	17.7	1.7	0.17	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	27900	43.6	2.8	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	10.3	1.7	0.069	mg/kg	D			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	596	1.7	0.05	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.022	0.034	0.0034	mg/kg	J	U	06A	N	1
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.4	0.25	mg/kg	JD	J	15	N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	14.3	0.87	0.077	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8100	80.3	2.2	mg/kg	D			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.4	1.6	0.22	mg/kg	ED			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11.7	1.6	0.16	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19500	40.1	2.6	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.6	0.063	mg/kg	D			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	314	1.6	0.046	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.011	0.034	0.0034	mg/kg	J	U	06A	N	1
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.27	4	0.23	mg/kg	JD	J	15	N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.3	0.8	0.071	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	10500	82.1	2.2	mg/kg	D			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	13.2	1.6	0.23	mg/kg	ED			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	13.6	1.6	0.16	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	22400	41.1	2.6	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	7.1	1.6	0.065	mg/kg	D			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	429	1.6	0.047	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.035	0.0035	mg/kg	J	U	06A	N	1
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.1	0.24	mg/kg	JD	J	15	N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	10.9	0.82	0.072	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7429-90-5	Aluminum	11000	87.2	2.4	mg/kg	D			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-47-3	Chromium	15	1.7	0.24	mg/kg	ED			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-50-8	Copper	14.1	1.7	0.17	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-89-6	Iron	24800	43.6	2.8	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-92-1	Lead	7.8	1.7	0.069	mg/kg	D			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-96-5	Manganese	474	1.7	0.05	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	U	06A	N	1
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-98-7	Molybdenum	0.3	4.4	0.25	mg/kg	JD	J	15	N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-02-0	Nickel	12.2	0.87	0.077	mg/kg	DB			N	10

ft - feet
REG - regular field sample
FD - field duplicate
SS - surface soil (0 - 0.5ft)
SD - sediment
PQL - practical quantitation limit
MDL - method detection limit
LQ - laboratory qualifier
VQ - validation qualifier
R1 - reason code no. 1
Fil - filtered
DF - dilution factor
HMX - octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
PETN - pentaerythritol tetranitrate
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl - methyl-2,4,6-trinitrophenylnitramine

ATTACHMENT 2

Summary of Analytical Results greater than the MDL

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9110	95.8	2.6	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13.5	1.9	0.27	mg/kg	D			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.1	1.9	0.19	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20800	47.9	3.1	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.9	0.076	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	202	1.9	0.055	mg/kg	DB			N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0048	0.037	0.0037	mg/kg	J	J	15	N	1
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.8	0.28	mg/kg	JD	U	06B	N	10
030A001	NWO-030-0001	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.96	0.084	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6690	85.3	2.3	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.2	1.7	0.24	mg/kg	D			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	10	1.7	0.17	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19200	42.7	2.7	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.7	1.7	0.067	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	358	1.7	0.049	mg/kg	DB			N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0051	0.031	0.0031	mg/kg	J	J	15	N	1
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.28	4.3	0.25	mg/kg	JD	U	06B	N	10
030A002	NWO-030-0002	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.7	0.85	0.075	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6400	87.2	2.4	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.2	1.7	0.24	mg/kg	D			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	8.4	1.7	0.17	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19200	43.6	2.8	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	3.9	1.7	0.069	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	399	1.7	0.05	mg/kg	DB			N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0057	0.033	0.0033	mg/kg	J	J	15	N	1
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.3	4.4	0.25	mg/kg	JD	U	06B	N	10
030A003	NWO-030-0003	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.5	0.87	0.077	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8450	93.7	2.5	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.3	1.9	0.26	mg/kg	D			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	12.9	1.9	0.19	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20700	46.9	3	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.5	1.9	0.074	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	317	1.9	0.053	mg/kg	DB			N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0056	0.034	0.0034	mg/kg	J	J	15	N	1
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.7	0.27	mg/kg	JD	U	06B	N	10
030A004	NWO-030-0004	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.7	0.94	0.082	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8540	86.7	2.3	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	12.5	1.7	0.24	mg/kg	D			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	13	1.7	0.17	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20400	43.4	2.8	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.2	1.7	0.069	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	347	1.7	0.049	mg/kg	DB			N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0065	0.033	0.0033	mg/kg	J	J	15	N	1
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.3	4.3	0.25	mg/kg	JD	U	06B	N	10
030A005	NWO-030-0005	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.3	0.87	0.076	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	5380	77.3	2.1	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	8.2	1.5	0.22	mg/kg	D			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	20	1.5	0.15	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22000	38.7	2.5	mg/kg	D			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	15.3	1.5	0.061	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	318	1.5	0.044	mg/kg	DB			N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0042	0.03	0.003	mg/kg	J	J	15	N	1
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.36	3.9	0.22	mg/kg	JD	U	06B	N	10
030A007	NWO-030-0006	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.7	0.77	0.068	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	7130	83.4	2.3	mg/kg	DB			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.1	1.7	0.23	mg/kg	D			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11	1.7	0.17	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22900	41.7	2.7	mg/kg	D			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.4	1.7	0.066	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	343	1.7	0.048	mg/kg	DB			N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0072	0.034	0.0034	mg/kg	J	J	15	N	1
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.33	4.2	0.24	mg/kg	JD	U	06B	N	10
030A008	NWO-030-0007	2/28/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.3	0.83	0.073	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6530	86.7	2.3	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.4	1.7	0.24	mg/kg	D			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	9.1	1.7	0.17	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17300	43.4	2.8	mg/kg	D			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	4.7	1.7	0.069	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	306	1.7	0.049	mg/kg	DB			N	10
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0069	0.031	0.0031	mg/kg	J	J	15	N	1
030A009	NWO-030-0008	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.8	0.87	0.076	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6490	79.4	2.1	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.3	1.6	0.22	mg/kg	D			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	8.1	1.6	0.16	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17200	39.7	2.5	mg/kg	D			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	3.9	1.6	0.063	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	316	1.6	0.045	mg/kg	DB			N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0046	0.032	0.0032	mg/kg	J	J	15	N	1
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.25	4	0.23	mg/kg	JD	U	06B	N	10
030A010	NWO-030-0009	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	8.7	0.79	0.07	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	6620	87	2.3	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.7	1.7	0.24	mg/kg	D			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11.2	1.7	0.17	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	17100	43.5	2.8	mg/kg	D			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.4	1.7	0.069	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	296	1.7	0.05	mg/kg	DB			N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0065	0.032	0.0032	mg/kg	J	J	15	N	1
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.27	4.3	0.25	mg/kg	JD	U	06B	N	10
030A011	NWO-030-0010	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9	0.87	0.077	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8330	81.9	2.2	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	12.9	1.6	0.23	mg/kg	D			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	15.7	1.6	0.16	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22100	41	2.6	mg/kg	D			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	6.7	1.6	0.065	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	362	1.6	0.047	mg/kg	DB			N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.0064	0.031	0.0031	mg/kg	J	J	15	N	1
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.32	4.1	0.24	mg/kg	JD	U	06B	N	10
030A012	NWO-030-0011	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.5	0.82	0.072	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	13400	93.5	2.5	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	17.5	1.9	0.26	mg/kg	D			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	18.9	1.9	0.19	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	29100	46.7	3	mg/kg	D			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	11.8	1.9	0.074	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	556	1.9	0.053	mg/kg	DB			N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	J	15	N	1
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.43	4.7	0.27	mg/kg	JD	U	06B	N	10
030A013	NWO-030-0012	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	15	0.93	0.082	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7429-90-5	Aluminum	6900	86.6	2.3	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-47-3	Chromium	10.5	1.7	0.24	mg/kg	D			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-50-8	Copper	11	1.7	0.17	mg/kg	DB			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-89-6	Iron	21800	43.3	2.8	mg/kg	D			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-92-1	Lead	4.3	1.7	0.068	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-96-5	Manganese	326	1.7	0.049	mg/kg	DB			N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-97-6	Mercury	0.0045	0.033	0.0033	mg/kg	J	J	15	N	1
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7439-98-7	Molybdenum	0.41	4.3	0.25	mg/kg	JD	U	06B	N	10
030A008	NWO-030-0013	2/28/2007	SS	0	0.5	FD	Metals	7440-02-0	Nickel	9.1	0.87	0.076	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	8910	98.1	2.6	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	12.1	2	0.27	mg/kg	D			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	15	2	0.2	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	20400	49	3.1	mg/kg	D			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	5.8	2	0.077	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	219	2	0.056	mg/kg	DB			N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.0092	0.038	0.0038	mg/kg	J	J	15	N	1
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.9	0.28	mg/kg	JD	U	06B	N	10
030A006	NWO-030-1001	2/27/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	11.9	0.98	0.086	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	11900	95.8	2.6	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	15	1.9	0.27	mg/kg	D			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	15.7	1.9	0.19	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	23800	47.9	3.1	mg/kg	D			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	8.1	1.9	0.076	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	476	1.9	0.055	mg/kg	DB			N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	J	15	N	1
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.34	4.8	0.28	mg/kg	JD	U	06B	N	10
030A014	NWO-030-1002	2/27/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	12.7	0.96	0.084	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7429-90-5	Aluminum	9310	102	2.8	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-47-3	Chromium	12.3	2	0.29	mg/kg	D			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-50-8	Copper	15.2	2	0.2	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-89-6	Iron	20900	51.1	3.3	mg/kg	D			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-92-1	Lead	6.3	2	0.081	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-96-5	Manganese	213	2	0.058	mg/kg	DB			N	10
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7439-97-6	Mercury	0.009	0.038	0.0038	mg/kg	J	J	15	N	1
030A006	NWO-030-1003	2/27/2007	SD	0	0.5	FD	Metals	7440-02-0	Nickel	11.7	1	0.09	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	10300	89.3	2.4	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	14.1	1.8	0.25	mg/kg	ED			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.1	1.8	0.18	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	24400	44.6	2.9	mg/kg	DB			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.9	1.8	0.071	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	481	1.8	0.051	mg/kg	D			N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.017	0.036	0.0036	mg/kg	J	U	06A	N	1
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.34	4.5	0.26	mg/kg	JD	J	15	N	10
030A015	NWO-030-5001	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.89	0.079	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8820	81.2	2.2	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	10.1	1.6	0.23	mg/kg	ED			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14	1.6	0.16	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20600	40.6	2.6	mg/kg	DB			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.3	1.6	0.064	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	392	1.6	0.046	mg/kg	D			N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.011	0.033	0.0033	mg/kg	J	U	06A	N	1
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.26	4.1	0.24	mg/kg	JD	J	15	N	10
030A016	NWO-030-5002	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.8	0.81	0.071	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9800	79.4	2.1	mg/kg	D			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13	1.6	0.22	mg/kg	ED			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.3	1.6	0.16	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	22600	39.7	2.5	mg/kg	DB			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	8.1	1.6	0.063	mg/kg	D			N	10

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	435	1.6	0.045	mg/kg	D			N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.032	0.033	0.0033	mg/kg	J	J	15	N	1
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	4	0.23	mg/kg	JD	J	15	N	10
030A017	NWO-030-5003	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.4	0.79	0.07	mg/kg	DB			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	18000	98.2	2.7	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	21.5	2	0.27	mg/kg	ED			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	26.5	2	0.2	mg/kg	DB			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	31100	49.1	3.1	mg/kg	DB			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	13.7	2	0.078	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	660	2	0.056	mg/kg	D			N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.027	0.036	0.0036	mg/kg	J	J	15	N	1
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.5	4.9	0.28	mg/kg	JD	J	15	N	10
030A018	NWO-030-5004	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	17.9	0.98	0.086	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	11600	88.9	2.4	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	15.1	1.8	0.25	mg/kg	ED			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	18.4	1.8	0.18	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	26100	44.5	2.8	mg/kg	DB			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	9.7	1.8	0.07	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	502	1.8	0.051	mg/kg	D			N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.019	0.035	0.0035	mg/kg	J	U	06A	N	1
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.4	0.26	mg/kg	JD	J	15	N	10
030A019	NWO-030-5005	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	14.1	0.89	0.078	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9810	82.8	2.2	mg/kg	D			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	15.3	1.7	0.23	mg/kg	ED			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	12.6	1.7	0.17	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	20700	41.4	2.6	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7.5	1.7	0.065	mg/kg	D			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	365	1.7	0.047	mg/kg	DB			N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.034	0.0034	mg/kg	J	U	06A	N	1
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	4.1	0.24	mg/kg	JD	J	15	N	10
030A020	NWO-030-5006	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.3	0.83	0.073	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	7380	77.9	2.1	mg/kg	D			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.6	1.6	0.22	mg/kg	ED			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	9.7	1.6	0.16	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19300	39	2.5	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.6	0.062	mg/kg	D			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	342	1.6	0.044	mg/kg	DB			N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.012	0.033	0.0033	mg/kg	J	U	06A	N	1
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.29	3.9	0.23	mg/kg	JD	J	15	N	10
030A021	NWO-030-5007	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	9.8	0.78	0.069	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	9890	80.2	2.2	mg/kg	D			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	13	1.6	0.22	mg/kg	ED			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	14.3	1.6	0.16	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	21600	40.1	2.6	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	7	1.6	0.063	mg/kg	D			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	380	1.6	0.046	mg/kg	DB			N	10
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.034	0.0034	mg/kg	J	U	06A	N	1
030A022	NWO-030-5008	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	12.6	0.8	0.071	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	13400	87.2	2.4	mg/kg	D			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	16.8	1.7	0.24	mg/kg	ED			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	17.7	1.7	0.17	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	27900	43.6	2.8	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	10.3	1.7	0.069	mg/kg	D			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	596	1.7	0.05	mg/kg	DB			N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.022	0.034	0.0034	mg/kg	J	U	06A	N	1

Summary of Analytical Results
Boardman Air Force Base

Location	Sample Number	Sample Date	Sample Type	Start Depth (ft)	End Depth (ft)	Sample Purpose	Fraction	CAS No.	Parameter	Result	PQL	MDL	Units	LQ	VQ	R1	Fil	DF
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.4	0.25	mg/kg	JD	J	15	N	10
030A023	NWO-030-5009	2/27/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	14.3	0.87	0.077	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7429-90-5	Aluminum	8100	80.3	2.2	mg/kg	D			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-47-3	Chromium	11.4	1.6	0.22	mg/kg	ED			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-50-8	Copper	11.7	1.6	0.16	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-89-6	Iron	19500	40.1	2.6	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-92-1	Lead	5.6	1.6	0.063	mg/kg	D			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-96-5	Manganese	314	1.6	0.046	mg/kg	DB			N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-97-6	Mercury	0.011	0.034	0.0034	mg/kg	J	U	06A	N	1
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.27	4	0.23	mg/kg	JD	J	15	N	10
030A024	NWO-030-5010	2/26/2007	SS	0	0.5	REG	Metals	7440-02-0	Nickel	11.3	0.8	0.071	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7429-90-5	Aluminum	10500	82.1	2.2	mg/kg	D			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-47-3	Chromium	13.2	1.6	0.23	mg/kg	ED			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-50-8	Copper	13.6	1.6	0.16	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-89-6	Iron	22400	41.1	2.6	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-92-1	Lead	7.1	1.6	0.065	mg/kg	D			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-96-5	Manganese	429	1.6	0.047	mg/kg	DB			N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-97-6	Mercury	0.014	0.035	0.0035	mg/kg	J	U	06A	N	1
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7439-98-7	Molybdenum	0.31	4.1	0.24	mg/kg	JD	J	15	N	10
030A025	NWO-030-5011	2/26/2007	SD	0	0.5	REG	Metals	7440-02-0	Nickel	10.9	0.82	0.072	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7429-90-5	Aluminum	11000	87.2	2.4	mg/kg	D			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-47-3	Chromium	15	1.7	0.24	mg/kg	ED			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-50-8	Copper	14.1	1.7	0.17	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-89-6	Iron	24800	43.6	2.8	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-92-1	Lead	7.8	1.7	0.069	mg/kg	D			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-96-5	Manganese	474	1.7	0.05	mg/kg	DB			N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-97-6	Mercury	0.013	0.035	0.0035	mg/kg	J	U	06A	N	1
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7439-98-7	Molybdenum	0.3	4.4	0.25	mg/kg	JD	J	15	N	10
030A015	NWO-030-5012	2/27/2007	SS	0	0.5	FD	Metals	7440-02-0	Nickel	12.2	0.87	0.077	mg/kg	DB			N	10

ft - feet
REG - regular field sample
FD - field duplicate
SS - surface soil (0 - 0.5ft)
SD - sediment
PQL - practical quantitation limit
MDL - method detection limit
LQ - laboratory qualifier
VQ - validation qualifier
R1 - reason code no. 1
Fil - filtered
DF - dilution factor

ATTACHMENT 3

Approved Variances

Shaw
Shaw Environmental & Infrastructure, Inc.

Variance No: Chem-001 Page 1 of 3

Project Name	FUDS SI NWO	Project Number:	116188
Date Of Issue	4/13/06	Linked w/NC No: (if applicable)	N/A

- - Variance Report - -

V. Summary of the Change: (by the person identifying the change)

Section of DoD QSM or MMRP SI PSAP	DoD QSM or MMRP SI PSAP Requirement	Variance Request	Justification for Variance Request
QSM Appendix DoD-B Table B-2 Page 134 (8330A) (RT window width)	The Retention Time width is +/- 3x Standard Deviation from 72-hour study	The Retention Time window is the greater of +/- 3x Standard Deviation or ½ average peak width	Small Retention Time Standard Deviation can produce unrealistic windows. Employing ½ average peak width does not allow overlap between target analytes per method SW8330A. A comparison between the calculated retention time window and ½ the peak width for method SW8330A is provided for USACE review.
QSM D.1.2.1 (LOD) Page 88 (Limit of Detection)	The ratio between the mean recovered concentration and the calculated MDL should be 1 to 5 for water and 1 to 10 for other matrices.	Under our current MDL study the following analytes did not meet the ratio: <u>SW8330A</u> (soil only) Nitrobenzene 1,3 – Dinitrobenzene 1,3,5 –Trinitrobenzene 2,4,6 –Trinitrotoluene <u>SW8330A</u> (water only) 2-Nitrotoluene	MDL verification check was analyzed and supported the calculated MDL study for 2005. GPL will change the spike concentration to meet the QSM criteria for the MDL study scheduled for 2006. The MDL verification check sample chromatograph demonstrates good signal-to-noise ratio (>3x the level of noise) and a table comparing the MDL, the RL and the MDL check standard reported in "ug/l" units for method SW8330A is provided for USACE review.
MMRP SI PSAP Table 4-D Page D-31 (method 6020) IDL study	IDL less than or equal to MDL	GPL's IDLs are not required to be less than or equal to MDL	An IDL determines the detection limit based on the differences produced when reading the base line. The MDL determines a detection limit based on analyte concentration and the variations in the readings, just above the base line. The standard deviation obtained from MDLs above, and IDLs at the base line are very similar therefore, it would not be possible to produce IDLs that are always lower than the MDLs. Comparisons of GPL's IDLs and MDLs for method SW6020 are provided for USACE review.

Variance No: Chem-001 Page 2 of 3

Project Name	FUDS SI NWO	Project Number:	116188
Date Of Issue	4/13/06	Linked w/NC No: (if applicable)	N/A
V.	Summary of the Change: (by the person identifying the change)		

Section of DoD QSM or MMRP SI PSAP	DoD QSM or MMRP SI PSAP Requirement	Variance Request	Justification for Variance Request
MMRP SI PSAP Table 4-C; Page D-28 (6010B) Table 4-D; page D-33 (6020) ICBs / CCBs Interference Check Solutions	No metals detected ≥ 2X MDL	"B" flag data where the ICS-A, ICB and/or CCB: absolute value is ≥ 2X MDL.	To identify the possibility of error or bias in the reporting of data; GPL will "B" flag all metals whose ICS-A, ICB and/or CCB exceeds 2x MDL. GPL will conduct the following corrective action measures to reduce the possibility of carry-over contamination from biasing metal results: GPL will increase rinse time between analyses to 3 minutes (triple the method requirement). GPL will re-analyze all impacted metal results where contamination is detected in associated blanks at levels >1/2 RL.

Section of DoD QSM or MMRP SI PSAP	DoD QSM or MMRP SI PSAP Requirement	Point of Clarification
MMRP SI PSAP Section 7.1.1 Laboratory Report Requirements Page QAPP-7-1	All soils reported on a dry weight basis	Soil samples from MMRP FUDS firing ranges are required to pass through a No. 10 sieve before sample digestion and analysis. However, soils collected from these sites may exhibit characteristics (i.e., clayey) that prevent effective sieving. To standardize sample preparation for all samples collected at Shaw's MMRP FUDS firing ranges; GPL will follow homogenization procedures referenced in GPL's SOP H.36. GPL SOP H.36 involves air drying soil samples for a minimum of 24 hours before the sample is homogenized and passed through a No. 10 sieve. In addition to identifying all soil samples that require sieving on the CoC, Shaw will reference GPL's SOP H.36 "Homogenization Procedures for Firing Range Soil Samples". GPL's SOP H.36 is provided for USACE review.
Identified by: Tim Roth		Date: 4/13/06

Project Name	FUDS SI NWO	Project Number:	116188
Date Of Issue	4/13/06	Linked w/NC No: (if applicable)	N/A

VI. Variance Requested: (by the person identifying the variance and the review committee)

Tim Roth

To Be Performed by:	GPL, LLLC	Date:	
To Be Verified by:	Elsa Tai	Date:	

VII. Justification of Variance: (by the review committee)

See Section V. Justification of Variance

VIII. Applicable Document/Work Plan: (by the person identifying the change)

Shaw Environmental, Inc., 2006, Type I Work Plan, Site Inspections at Multiple Sites, NWO Region, Formerly Used Defense Sites, Military Munitions Response Program, February.

Distribution List:

Shaw Project Files
Paul Ioannides, GPL, LLLP
Sean Cupolo, GPL, LLLP
Elsa, Tai, GPL, LLLP
Mark Meacham, USACE-NWO
Cheryl Groenjes, USACE-NWO

Cheryl Groenjes
5/16/06

- - Signatures - -

Requested by: **Tim Roth** Date: **5/10/06**
(printed name and date)
Signature: 5/10/06

Approved by: Mark Meacham Date: 5/16/06
(printed name and date)
Signature:

Proj. Mgr Approval: PETER KELSALL Date: 5/20/06
(printed name and date)
Signature:

QA Approval: RANDAL MCGILLIS Date: 6-22-06
(printed name and date)
Signature:

Appendix H
Geographical Information Systems Data

Photo	Name	Description	Northing (Y UTM)*	Easting (X UTM)*
01	030A009	26-FEB-07 11:08:05; Sample location for ID# NWO-030-0008; No MEC/MC encountered; 1 photo 030-BAFR-01-26FEB07	5074466	284904
02	030A019	26-FEB-07 12:28:50; Sample location for ID# NWO-030-5005; No MEC/MC encountered; 1 photo 030-BAFR-02-26FEB07	5058129	276422
03	030A018	26-FEB-07 13:16:23; Sample location for ID# NWO-030-5004; No MEC/MC encountered; 1 photo 030-BAFR-03-26FEB07	5059404	277541
04	030A017	26-FEB-07 13:51:38; Sample location for ID# NWO-030-5003; No MEC/MC encountered; 1 photo 030-BAFR-04-26FEB07	5059531	278687
05	030A016	26-FEB-07 14:20:13; Sample location for ID# NWO-030-5002; No MEC/MC encountered; 1 photo 030-BAFR-05-26FEB07	5059677	279861
06	030A005	26-FEB-07 14:59:18; Sample location for ID# NWO-030-0003; No MEC/MC encountered; 1 photo 030-BAFR-06-26FEB07	5061497	280459
07	030A025	26-FEB-07 15:32:29; Sample location for ID# NWO-030-5011; No MEC/MC encountered; 1 photo 030-BAFR-07-26FEB07	5057525	281183
08	030A021	26-FEB-07 17:02:41; Sample location for ID# NWO-030-5007; No MEC/MC encountered; 1 photo 030-BAFR-08-26FEB07	5067017	280686
09	030A024	26-FEB-07 17:37:19; Sample location for ID# NWO-030-5010; No MEC/MC encountered; 1 photo 030-BAFR-09-26FEB07	5065870	282431
10	030A011	27-FEB-07 07:50:32; Sample location for ID# NWO-030-0010/MS/MSD; Heavy MEC debris encountered; 1 photo 030-BAFR-10-27FEB07	5065570	284677
11	030A012	27-FEB-07 08:04:30; Sample location for ID# NWO-030-0011; Heavy MEC debris encountered; 1 photo 030-BAFR-11-27FEB07	5065590	284950
12	012	27-FEB-07 8:15:09; Heavy surface/subsurface MEC debris; photo 030-BAFR-12-27FEB07	5065531	284784
13	030A020	27-FEB-07 09:05:45; Sample location for ID# NWO-030-5006; No MEC/MC encountered; 1 photo 030-BAFR-13-27FEB07	5063545	284883
14	030A022	27-FEB-07 10:30:00; Sample location for ID# NWO-030-5008; No MEC/MC encountered; 1 photo 030-BAFR-14-27FEB07	5061321	284035
15	030A023	27-FEB-07 11:08:15; Sample location for ID# NWO-030-5009; No MEC/MC encountered; 1 photo 030-BAFR-15-27FEB07	5057948	284517
16	030A013	27-FEB-07 11:46:43; Sample location for ID# NWO-030-0012; No MEC/MC encountered; 1 photo 030-BAFR-16-27FEB07	5059290	282402
17	030A014	27-FEB-07 12:08:53; Sample location for ID# NWO-030-1002; No MEC/MC encountered; 1 photo 030-BAFR-17-27FEB07	5059237	281565
18	030A015	27-FEB-07 13:05:22; Sample location for ID# NWO-030-5001, NWO-030-5012; No MEC/MC encountered; 1 photo 030-BAFR-18-27FEB07	5059936	282313
19	030A010	27-FEB-07 14:06:32; Sample location for ID# NWO-030-0009; No MEC/MC encountered; 1 photo 030-BAFR-19-27FEB07	5074034	283679
20	030A002	27-FEB-07 14:25:42; Sample location for ID# NWO-030-0002; No MEC/MC encountered; 1 photo 030-BAFR-20-27FEB07	5072790	279899
21	030A001	27-FEB-07 15:17:36; Sample location for ID# NWO-030-0001; No MEC/MC encountered; 1 photo 030-BAFR-21-27FEB07	5063362	279813
22	030A004	27-FEB-07 15:39:58; Sample location for ID# NWO-030-0004; No MEC/MC encountered; 1 photo 030-BAFR-22-27FEB07	5062058	279533
23	030A006	27-FEB-07 15:50:01; Sample location for ID# NWO-030-1003, NWO-030-1001; No MEC/MC encountered; 1 photo 030-BAFR-23-27FEB07	5062016	279650
24	024	27-FEB-07 16:14:17; Start of Target Area 1 visual recon heading ENE; photo 030-BAFR-24-27FEB07	5063092	279387
25	025	27-FEB-07 16:17:17; MEC debris, M38 pieces; photo 030-BAFR-25-27FEB07	5063138	279607
26	026	27-FEB-07 16:18:58; End of Target Area 1 visual recon heading ENE; photo 030-BAFR-26-27FEB07	5063172	279715
27	027	27-FEB-07 16:21:57; Start of Target Area 1 visual recon heading south; photo 030-BAFR-27-27FEB07	5063276	279554
28	028	27-FEB-07 16:25:28; End of Target Area 1 visual recon heading south; photo 030-BAFR-28-27FEB07	5062986	279552
29	030A008	28-FEB-07 8:21:15; Sample location for ID# NWO-030-0007, NWO-030-0013; Moderate MEC debris encountered; 1 photo 030-BAFR-29-28F	5070005	284553
30	030A007	28-FEB-07 8:31:49; Sample location for ID# NWO-030-0006; Moderate MEC debris encountered; 1 photo 030-BAFR-30-28FEB07	5070044	284769
31	031	28-FEB-07 8:37:15; MEC debris, large bomb frag; photo 030-BAFR-31-28FEB07	5070048	284769
32	032	28-FEB-07 8:40:41; MEC debris, large bomb frag; photo 030-BAFR-32-28FEB07	5069933	284704
33	030A003	28-FEB-07 9:07:11; Sample location for ID# NWO-030-0003; No MEC/MC debris encountered; 1 photo 030-BAFR-33-28FEB07	5072287	280581

*Coordinates for the ranges are in UTM Zone 11N, NAD 1983.

Appendix I
Geophysical Data

This appendix is not used.

Appendix J
Conceptual Site Model

Overview

A site-specific CSM summarizes available site information and identifies relationships between exposure pathways and associated receptors. A CSM is used to determine the data types necessary to describe site conditions and quantify receptor exposure, and discusses the following information:

- Current site conditions and future land use;
- Potential contaminant sources (e.g., lead projectiles in an impact berm);
- Affected media;
- Governing fate and transport processes (e.g., surface water runoff and/or groundwater migration);
- Exposure media (i.e., media through which receptors could contact site-related contamination);
- Routes of exposure (e.g., inhalation, incidental ingestion, and dermal contact); and
- Potential human and/or representative ecological receptors at the exposure point. Receptors likely to be exposed to site contaminants are identified based on current and expected future land uses.

The CSM is evaluated for completeness and further developed as needed through TPP meetings. Based on a review of documents and interviews, the following AOCs have been identified within the Boardman AFR:

- Target No. 1,
- Target No. 2,
- Carty Reservoir Bomb Target,
- Range Complex No. 1,
- Demolition Area No. 2, and
- Impact Area.

Because of dissimilar historical use, site conditions, or prior investigations, a CSM is developed for each AOC. MEC and MC are analyzed individually within the CSM.

MEC was reported as recently as Spring of 2006 at Target No. 2 AOC and June 2006 at Demolition Area No. 2. At the Target No. 2 AOC, reports were made following the discovery of remnants of six AN-M57 GP practice bombs with spotting charges (capable of detonating) at a local recycler. These 6 bombs and remnants of 15 additional bombs recovered from the Target No. 2 AOC were detonated by a Navy EOD team at the nearby Navy Bombing Range. The bombs remnants had been gathered from agricultural fields and placed in a pile by the agricultural workers.

At the Demolition Area No. 2 AOC, the property lease holder reported to the Oregon State Police the discovery of an M83 butterfly bomb and various fuzes. These MEC were destroyed by the Oregon State Police bomb unit in June 2006.

Note: Because this text is taken from the Final TPP Memorandum, all figures and tables referenced in this appendix refer to figures and tables contained in that document. The Final TPP Memorandum is included in Appendix B of this SI Report.

Conceptual Site Model – Target No. 1 AOC

The Target No. 1 AOC consists of a single target configured with concentric circles with radii of 100, 200, and 300 ft, which was standard range layout for the time of use. The target name is consistent with the ASR Supplement. The southern one-third of the AOC overlaps with Carty Reservoir Target AOC. Figure 1 shows the general location of the Target No.1 AOC. Figure 2 shows a more detailed view of the AOC using an aerial photo overlay.

Current and Future Land Use

- The Target No. 1 AOC is located on BAIC, Inc. and PGE property adjacent to Carty Reservoir. Approximately 40 percent of the target drop area safety zone is flooded by Carty Reservoir. The safety zone is an area surrounding a target where the potential for bomb impacts exists.
- The terrain is flat with a gradual slope toward the shoreline of Carty Reservoir.
- The area northeast of the safety zone has been extensively reworked during power plant construction and the building of an earthen dam for Carty Reservoir. The property to the north and west of the target is now used for irrigated farming.
- One groundwater monitoring well installed by the PGE Power Generating Station (well "008") is located within the AOC. An industrial water supply well is located approximately 650 ft northeast of the outer boundary of the AOC.
- Carty Reservoir is the nearest surface water body to the AOC. Sixmile Canyon Creek flows through the northeast corner of the target.
- The source of water for Carty Reservoir is via pump from the Columbia River. The reservoir water is used for cooling at the PGE Power Generating Station.
- Future land use is expected to remain the same.

Former Range Use

- The target was used between 1948 and 1960 and is thought to be a replacement target for the Carty Reservoir Target, which was used between 1942 and 1945.
- It is unclear of the extent of use of this target. During the ASR field visit, no MEC or munitions debris were identified within the target footprint or safety zone. The contractor that conducted the INPR for the USACE identified several small items and according to the ASR, "the description matched that of a 31-lb practice bomb." This munitions debris is thought to be from a Mk-76 25-lb practice bomb. Munitions debris of a suspected M38A2 practice bomb was identified during the SI visual reconnaissance.

Potential Contaminant Sources

- The ASR Supplement identified the likely range munitions used at this AOC as being AN-Mk 5, AN-Mk 23, and AN-Mk 43 practice bombs. These practice bombs contained black powder and a spotting charge. In addition, the Mk-76 and

M38A2 practice bombs may also have been used based on identified munitions debris.

MEC Evaluation

Types of MEC

- Munitions debris from a suspected M38A2 practice bomb was identified during the SI visual reconnaissance.
- No MEC or munitions debris were identified during the ASR site visit in 1997. However, the contractor that conducted the INPR for the USACE identified several small items and according to the ASR, "the description matched that of a 31-lb practice bomb." This munitions debris is thought to be from a MK-76 25-lb practice bomb.
- The potential for UXO to be present at this AOC is low, based on the lack of MEC and low density of munitions debris located in the area.

Surface Exposure Pathway

- The potential route of human exposure (PGE and agricultural workers) to MEC or munitions debris includes direct contact by vehicles, agricultural tilling, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure (PGE and agricultural workers) to MEC or munitions debris would be by intrusive drilling or digging activities (including agricultural tilling) or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MC Evaluation

Types of MC

- Munitions debris from practice bombs consists primarily of light gauge sheet metal, cast iron, or lead. Iron is the primary constituent of sheet metal and cast iron. Other metals that may be present in sheet metal and cast iron include aluminum, chromium, copper, lead, molybdenum, and nickel.
- Spotting charges or signals used with practice bombs at this AOC primarily consist of a blank shotgun shell with black powder. Black powder consists of potassium nitrate, sulfur, and charcoal. A red or white phosphorous pyrotechnic charge may also have been used.
- Although not documented, other bomb munitions may have been used on this range that contained other explosives including nitroglycerin. This is based on

munitions used at nearby Target No. 2 and INPR Site No. 1. However sample analysis competed during the SI did no detect any explosive MC.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from training activities. The soil also serves as a secondary source of potential surface water, sediment, groundwater, or air contamination.
- Surface Water: Carty Reservoir may be potentially affected, although the MC from munitions used at this AOC may not pose a significant risk.
- Sediment: Sediment in Carty Reservoir may be potentially affected by surface water runoff from impacted soil areas or from MC in the soil present prior to inundation when Carty Reservoir was created. The migration of metals within the sediments is relatively low because of the low mobility of the metals in water and the arid climate.
- Groundwater: Groundwater is a potentially affected media since the creation of Carty Reservoir has resulted in a groundwater mound beneath the reservoir. Migration of MC directly to the groundwater via surface water infiltration is considered to be possible. However, the constituents of the MC may not pose a significant risk.
- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at the Boardman AFR include soil, surface water, sediment, groundwater, and air. A pathway evaluation for each media is discussed below and provided in Table 3.

Figure 3 illustrates the CSM for the Target No.1 AOC and potential pathways of MC contamination.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.
- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

SI Results for MC

- One surface soil sample was collected from Target No. 1 and analyzed for select metals and explosives. Detected results were compared to background concentrations and there were no exceedances of background. No surface water or sediment samples were collected form this AOC.

Surface Water Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated surface water include incidental ingestion of, dermal contact with, and inhalation of surface water.
- The potential routes of wildlife (including aquatic organisms) exposure to contaminated surface water include ingestion of and direct contact with surface water present at or near the AOC.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

SI Results for MC

- No surface water samples were collected form this AOC. One surface water sample was collected from Carty Reservoir during the PA/SI and analyzed for perchlorate. No detectable concentrations of perchlorate were found in the surface water sample collected from Carty Reservoir. The samples were not analyzed for metals or explosives. However, water quality (including metals) of Carty Reservoir is monitored monthly by PGE. Results from the monitoring data do not indicate metal concentrations that are above PGE operating permit conditions. The makeup water for Carty Reservoir is pumped directly from the Columbia River. Lack of MEC and munitions debris resulting from use of Target No.1 suggest that the likelihood of MC impacts to surface water is low. Only black powder explosives and red or white phosphorous signals were known to have been used and the metals contained in the bomb casings consisted of either sheet metal, iron, or lead.

Sediment Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated sediment include incidental ingestion of and dermal contact with sediment.
- The potential routes of wildlife exposure to contaminated sediment include ingestion of and direct contact with sediment.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

SI Results for MC

- No sediment samples were collected from Carty Reservoir for this AOC. A sediment sample was collected as part of the Carty Reservoir Bomb Target evaluation.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (PGE and agricultural workers).

SI Results for MC

- Groundwater samples were collected from two wells in the Target No. 1 vicinity during the PA/SI (Weston, 2004). One well was located upgradient of Target No.1 and one well was within the Target No. 1 AOC boundary. Samples were analyzed for perchlorate. In addition, both of these wells are sampled annually by PGE for metals. Analytical results indicate that metals were below the background well concentrations. An exception to this was for iron which exceeded the background concentration. However, the concentration was well below the human health screening value. Perchlorate was detected in the upgradient well but not the downgradient well. The detection in the upgradient well was below the DoD action level.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

SI Results for MC

Air is considered to be a potential pathway due to inhalation of MC from blowing dust. The potential inhalation of soil particles is included in the development of health-based screening values for soil.

Conceptual Site Model – Target No. 2 AOC

The Target No. 2 AOC consists of a single target configured with concentric circles in 200- and 400-yard radii. In addition, there were three scoring towers 120 degrees apart near the target. This range was previously assessed during the PA/SI. The target name is consistent with the ASR Supplement. Figure 1 shows the general location of the Target No. 2 AOC. Figure 4 shows the configuration and current land uses in the vicinity of the target.

Current and Future Land Use

- The Target No. 2 AOC is located on agricultural property owned by Three-mile Canyon Farms. The area is currently used for irrigated farming.
- No groundwater wells are located within the boundary of Target No 2 AOC.
- The nearest surface water is Sixmile Canyon Creek located approximately 1,800 ft west of the southwest boundary of the AOC.
- The future land use is not expected to change from the present use.

Former Range Use

- The target was used between 1942 and 1960 for practice bombing.

Potential Contaminant Sources

- Likely range munitions used at this AOC are listed as AN-M50 incendiary bombs, M38A2 practice bombs and Mk 6 2.25-inch practice rockets. Recent MEC finds at Target No. 2 included AN-M57 GP practice bomb. Munitions debris from AN-47, and Mk-15 Mod 3 100lb practice bombs has also been reported.
- The AN-M50 incendiary bombs were cased in a magnesium shell and contained a fuze and thermite. Thermite consists of a mixture of powdered aluminum metal and ferric oxide.
- The M38A2 practice bombs were a sand-filled, sheet metal cased, 100-lb practice bomb and contained a black powder spotting charge.
- The Mk 6 2.25-inch practice rockets were constructed from sheet metal. The propellant used in the rocket was Ballistite, which consists of nitrocellulose and nitroglycerin. There was no spotting charge with the Mk 6 rockets. The use of the Mk 6 practice rocket is thought to be limited at this target as evidenced by the scarcity of spent rocket motors..
- The reported AN-M57 G.P practice bombs contained a spotting charge only. The high explosive version of this bomb contains Amatol or TNT.
- The AN-47 practice bombs are inert.

MEC Evaluation

Types of MEC

- The types of munitions used at the Target No. 2 AOC are listed above. Debris from these munitions was observed during the ASR site visit in 1997, during the 2004 PA/SI investigation, and in 2006 during a Navy EOD recovery. In addition, four 75-mm HEAT, M66 projectiles were reported to have been destroyed in the target area by Army EOD in 1987. The ASR indicated that the 75-mm projectiles were likely brought to the site for disposal and not used at the site.
- MEC was reported from this AOC as recently as March 2006.

Surface Exposure Pathway

- The potential route of human exposure (agricultural workers) to MEC or munitions debris includes direct contact by vehicles, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure (agricultural workers) to MEC or munitions debris would be by intrusive drilling or digging activities, agricultural tilling, or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MEC Risk Evaluation

MEC has been reported historically at Target No. 2 as recently as 2006. The MEC risk for this area is considered to be moderate based on the following:

- MEC has been reported as recently as 2006, recent finds were AN-M57 GP practice bombs;
- The area is used for farming, undergoing yearly tillage to depths of approximately 18 inches and MEC is periodically unearthed;
- The area is frequented by farm workers, the general public does not have routine access to the AOC.

MC Evaluation

Types of MC

- MC from practice bombs consists primarily of light gauge sheet metal and magnesium metal. Iron is the primary constituent of sheet metal. The incendiary bomb casings are constructed from magnesium. Other metals that may be present in sheet metal include iron include aluminum, chromium, copper, lead, molybdenum, and nickel.

- Spotting charges or signals used with practice bombs at this AOC primarily consist of a black powder, which contains potassium nitrate, sulfur, and charcoal, and thermite, which contains iron oxide, aluminum, and sulfur. In addition, the AN-M57 GP bombs may have contained either Amatol (TNT and ammonium nitrate) or TNT.
- The propellant used in the Mk 6 2.25-inch practice rockets contained nitrocellulose and nitroglycerin.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from training activities. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Surface Water: Sixmile Canyon Creek may be potentially affected by runoff from the target area.
- Sediment: Sediment in Sixmile Canyon Creek may be potentially affected by surface water runoff from impacted soil areas. However, Sixmile Canyon Creek is located approximately 1,800 ft west of the AOC boundary (Figure 4) and the target itself was located approximately 6,100 ft east. The potential for metals migration within the sediments is relatively low because of the low mobility of the metals in water and the arid climate.
- Groundwater: Groundwater is a potentially affected media. There are potential receptors downgradient and outside of the FUDS boundary and the pathway is considered potentially complete While no groundwater depths are available for the Target No. 2 area, thin perched groundwater layers above the basalt bedrock are possible, particularly with the irrigated farming that is occurring in the area. There is the potential for MC migration to groundwater. No groundwater drinking water wells are within the AOC.
- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at the Boardman AFR include soil, surface water, sediment, groundwater, and air. A pathway evaluation for each media is discussed below and provided in Table 3.

Figure 3 illustrates the CSM for the Target No. 2 AOC and potential pathways of MC contamination.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.

- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (agricultural).
- Wildlife.

SI Results for MC

- Two surface soil samples were collected during the SI field activities and analyzed for select metals and explosives. In addition, two surface soil and two subsurface soil samples were collected from this AOC during the PA/SI (Weston, 2004). The PA/SI samples were analyzed for metals and perchlorate. Analytical results for metals for all soil samples were below site background values. There were no explosive or perchlorate detections.

Surface Water Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated surface water include incidental ingestion of, dermal contact with, and inhalation of surface water.
- The potential routes of wildlife (including aquatic organisms) exposure to contaminated surface water include ingestion of and direct contact with surface water present at or near the AOC.
- There are no surface water bodies or streams within the AOC.

Receptors

- Workers (agricultural).
- Wildlife.

SI Results for MC

- No surface water samples were collected during the SI field activities at Target No. 2. Five surface water samples were collected during the PA/SI from locations located west of the Target No. 2. The surface water samples were analyzed for perchlorate. Perchlorate was detected in all surface water samples. All concentrations were below the DoD action level. The highest perchlorate concentration was in the most upstream sample and the lowest was in the most downstream sample. The most upstream sample location is upstream of all FUDS AOCs. These results indicate that the source of perchlorate in Sixmile Canyon Creek is not from FUDS related activity.

Sediment Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated sediment include incidental ingestion of and dermal contact with sediment.

- The potential routes of wildlife exposure to contaminated sediment include ingestion of and direct contact with sediment.

Receptors

- Workers (agricultural).
- Wildlife.

SI Results for MC

- No sediment samples were collected during the SI field activities at Target No. 2. One sediment sample was collected during the PA/SI from locations located west of the Target No. 2. The sediment sample was analyzed for metals. The metals analytical results from the sediment sample was below background concentration.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (agricultural).

SI Results for MC

- No groundwater samples are planned for the Target No. 2 AOC. The PA/SI addressed the groundwater pathway for the Boardman AFR. Groundwater samples were collected both up and downgradient of this AOC. Sample results show that no explosive compounds were detected. However, perchlorate was detected in both up and downgradient samples. Metals were not included in the PA/SI analytical suite. However, the types of metals contained in munitions used at Target No. 2 have a low solubility of the metals associated with munitions used at this AOC, the expected depth to groundwater (>40 ft), the thin occurrence of groundwater (few feet thick) would make it unlikely that impacts from metals would be noted. Therefore, metals are not considered a contaminant of concern for groundwater.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (agricultural).
- Wildlife.

SI Results for MC

- Air is considered to be a potential pathway due to inhalation of MC in from blowing dust. The potential inhalation of soil particles is included in the development of health-based screening values for soil.

Conceptual Site Model – Carty Reservoir Bomb Target AOC

The Carty Reservoir Bomb Target AOC consists of a single target configured with concentric circles (spacing not identified). This target is located on the western side of Carty Reservoir. Prior to the ASR, this target was not identified in any historical documents. It is thought that this target was the original target at the range. The ASR team believed that the original Target No. 1 was located in this area and then was relocated approximately 1 mile north in approximately 1946. The Carty Reservoir Bomb Target was located in a depression which made scoring difficult. The new target No. 1 location is much flatter and at a higher elevation. This range was assessed during the PA/SI. The target name is consistent with the ASR Supplement. Figure 1 shows the general location of Carty Reservoir Bomb Target AOC. Figure 5 shows a more detailed view of the AOC. The configuration and current land uses in the vicinity of the target. This AOC overlaps Target No. 1 AOC.

Current and Future Land Use

- The Carty Reservoir Bomb Target AOC is located on PGE and BAIC, Inc (leased by Three-mile Canyon Farms) property. The western half of the AOC is currently used for irrigated farming and the southern and eastern portion is native vegetation consisting of grasses. There is evidence of one time livestock grazing in the area.
- The terrain slopes toward Carty Reservoir.
- No groundwater wells are located within the boundary of this AOC.
- Carty Reservoir covers approximately 30 percent of the area.

Former Range Use

- The target is thought to have been used between 1942 and 1944 for practice bombing; however, the actual date of use is not known.

Potential Contaminant Sources

- Likely range munitions used at this AOC was the Mk 23, and M38A2 practice bombs and the M75 and M84 target marker bomb.
- The Mk 23 practice bombs were constructed from cast iron and contained black powder and a red phosphorus pyrotechnic signal charge.
- The M38A2 practice bombs were a sand-filled sheet metal cased 100-lb practice bomb and contained a black powder spotting charge.
- The M75 and M84 target marker bombs were cased in sheet metal and contained a burster and fuze and a charge of red iron ore (hematite) that was used as a marker.

MEC Evaluation

Types of MEC

- The types of munitions used at the Carty Reservoir Bomb Target AOC are listed above. Large amounts of debris from these munitions were observed during the

ASR site visit in 1997. This AOC was the only area where the ASR team observed relatively intact, fuzed, and suspected live munitions (M75/M84 practice bomb) during the 1997 site visit.

- The potential for UXO to be present at this AOC is high. This is based on prior use, historical documents, interviews, and results of the ASR site visit.

Surface Exposure Pathway

- The potential route of human exposure (PGE and agricultural workers) to MEC or munitions debris includes direct contact by vehicles, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure (primarily agricultural workers) to MEC or munitions debris would be by intrusive drilling or digging activities or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MEC Evaluation/Investigation Needed

- No visual field reconnaissance of the target area will be conducted with the objective to locate MEC, however, a visual reconnaissance will be completed to clear soil sample locations. The reconnaissance will be conducted by a qualified UXO technician with the aid of a hand-held magnetometer or metal detector.

MC Evaluation

Types of MC

- Munitions debris from practice bombs consists primarily of light gauge sheet metal and cast iron. Iron is the primary constituent of sheet metal and cast iron. Other metals that may be present in sheet metal include iron include aluminum, chromium, copper, lead, manganese, molybdenum, and nickel.
- Spotting charges or signals used with practice bombs at this AOC primarily consist of a black powder that contains potassium nitrate, sulfur, and charcoal. The M75/M84 Target ID bomb also used a booster charge containing Tetryl.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from training activities. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Surface Water: Carty Reservoir may be potentially affected by MC contained in soils prior to water inundation of portions of the target area.

- Sediment: Sediment in Carty Reservoir may be potentially affected by MC in soils prior to water inundation of portions of the target area.
- Groundwater: Groundwater is a potentially affected media since the creation of Carty Reservoir has resulted in a groundwater mound beneath the reservoir. Migration of MC directly to the groundwater via surface water infiltration is considered to be possible. However, the constituents of the MC may not pose a significant risk.
- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at the Boardman AFR include soil, surface water, sediment, groundwater, and air. A pathway evaluation for each media is discussed below and provided in Table 3.

Figure 3 illustrates the CSM for the Carty Reservoir Bomb Target AOC and potential pathways of MC contamination.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.
- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

MC Soil Evaluation/Investigation Needed

- Two soil samples will be collected from for the Carty Reservoir Bomb Target AOC. Soil samples will be located near the target center where a high density of munitions debris has been reported. Samples will be analyzed for select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). The basis for this metals list is provided in "MC Soil Evaluation/Investigation Needed" for Target No. AOC. The primary explosive used in the practice bombs was black powder explosives and red or white phosphorous signals were documented as being used at this AOC. In addition the M75/M84 Target ID bomb also used a booster containing the explosive Tetryl. The two samples will also be analyzed for explosives (including nitroglycerin).

Surface Water Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated surface water include incidental ingestion of, dermal contact with, and inhalation of surface water.
- The potential routes of wildlife (including aquatic organisms) exposure to contaminated surface water include ingestion of and direct contact with surface water present at or near the AOC.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

MC Surface Water Evaluation/Investigation Needed

- No surface water samples will be collected from Carty Reservoir. A water sample was collected from Carty Reservoir during the PA/SI in 2004 and analyzed for perchlorate only. Perchlorate was not detected in the surface water sample.
- Sampling for metals and explosives is not required. Water samples from the reservoir are analyzed monthly for metals and other water quality parameters. The only documented explosive used at this target was black powder, whose constituents are nonhazardous.

Sediment Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated sediment include incidental ingestion of and dermal contact with sediment.
- The potential routes of wildlife exposure to contaminated sediment include ingestion of and direct contact with sediment.

Receptors

- Workers (PGE and agricultural).
- Wildlife.

MC Sediment Evaluation/Investigation Needed

- One sediment sample will be collected from Carty Reservoir and analyzed for explosives (including nitroglycerin) and select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). The basis for this metals list is provided in "MC Soil Evaluation/Investigation Needed" for Target No. AOC. While only black powder explosives and red or white phosphorous signals were documented as being used at this AOC, ODEQ requested that one sample be analyzed for explosives (including nitroglycerin) to demonstrate that no explosives, other than black powder, were used at the target. Sampling for perchlorate is not required as no perchlorate was detected

in the surface water sample collected during the PA/SI and perchlorate containing compounds were not part of the munitions used at this AOC.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (PGE and agricultural).

MC Groundwater Evaluation/Investigation Needed

- No additional groundwater samples will be collected from the Carty Reservoir Bomb Target AOC. The PA/SI addressed the groundwater pathway for the Boardman AFR. Groundwater samples were collected both up and downgradient of this AOC. Sample results show that no explosive compounds were detected. Perchlorate was detected in an upgradient sample, and in downgradient samples off the FUDS property boundary. Metals were not included in the PA/SI analytical suite. However, metals are routinely analyzed for in groundwater samples collected from nearby downgradient PGE monitoring wells. These results are available for use in this SI.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (agricultural).
- Wildlife.

MC Air Evaluation/Investigation Needed

- No air samples will be collected from the Boardman AFR. Analytical results from soil samples will be us used in the evaluation of the air pathway. The USEPA 2004 Region 9 PRGs incorporate dust exposure into the values and additional exposure data beyond soil data is not required.

Conceptual Site Model – Range Complex No. 1 AOC

The Range Complex No. 1 AOC consists of a three areas: INPR Site No. 1, the Demolition Area, and the Turret Gunnery Training Range. Figure 1 shows the general location of the Range No. 1 Complex AOC. Figures 6 through 8 show details of the AOC.

The INPR Site No. 1 is a bomb target that was in use between 1946 and 1960. The ASR Supplement indicated that the target was configured with concentric circles of 100, 200, and 300 ft. However, analysis of recent aerial photos shows faint concentric circles at 75, 500, and 1000 ft (see Figure 6). A portion of the safety zone for this site lies within the non-FUDS property currently used by the Navy Bombing Range. Soil samples were collected from INPR Site No.1 during the PA/SI.

The Demolition Area was used for the demolition of munitions between 1952 and 1960 and may be the area used by the Umatilla Ordinance Deport for demolition of unserviceable munitions. The area consists of two rows, approximately 200 ft apart. Each row has 20 pits (craters) spaced 50 ft apart. Munitions debris is embedded in the crater walls and scattered in a wide radius from the craters.

The Turret Gunnery Training Range was used to train B-36 Bomber gunners to fire at target drones that flew across their front. The turret gun firing points were located on current Navy Bombing Range Property and are not FUDS property. Only the downrange portion of the range is within the Boardman AFR FUDS. A portion of the safety zone is outside of the FUDS boundary on the active Navy bombing range. The range name is consistent with the ASR Supplement.

Current and Future Land Use

- Range Complex No.1 is shown on Figures 6 through 8. Much of the northern and eastern portions of the range complex are currently being used for irrigated crops. The southern portion of the range is used for the Boeing Antennae Test Range, and wildlife conservation area managed by The Nature Conservancy.
- No groundwater wells are located within the boundary of this AOC.
- Future land use is expected to remain the same as current land use.

Former Range Use

- The INPR Site No. 1 was active from 1946 to 1960 and was used for practice bombing.
- The Demolition Area was active from between 1952 and 1960 and was used for demolition and disposal of munitions.
- The Turret Gunnery Training Range was used between 1952 and 1960. It was used to train B-36 Bomber gunners.

Potential Contaminant Sources

- The likely range munitions used were:

- INPR Site No. 1 – Mk 23, Mk 76, Mk 84, Mk 89, Mk 106, M38A2, BDU 10, and BDU 33 practice bombs. In addition Weston (2004) reported finding a Mark-12 practice nuclear bomb (inert training bomb) and a Fuel-Air-Explosive BLU-95 bomb. The BLU-95 was likely a bomb that drifted over from the adjacent Navy Bomb Range.
- Demolition Area – C-4 Blocks, M60 igniter, detonation cord and time blasting fuze, blasting caps both electric and non-electric, all other munitions types used on the Boardman AFR.
- Turret Gunnery Training Range – 20-mm Ball practice ammunition. The projectile is machined from bar steel.

Table 2 summarizes the constituents of the munitions.

MEC Evaluation

Types of MEC

- The types of munitions used at the Range Complex No. 1 AOC are listed above. Debris from these munitions were observed during the ASR site visit in 1997. The ASR noted that other than the Mk 23 practice bomb, the remaining bombs on the INPR Site No. 1 site are post Korean War vintage, particularly the BDU 10 practice nuclear bomb.
- The potential for UXO to be present at this AOC is high within INPR Site No.1 and the Demolition Area and low within the Turret Gunnery Range . This is based on prior use, historical documents, interviews, and results of the ASR site visit.

Surface Exposure Pathway

- The potential route of human exposure (Boeing, agricultural workers, and natural area workers) to MEC or munitions debris includes direct contact by vehicles, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure (Boeing, agricultural workers, and natural area workers) to MEC or munitions debris would be by intrusive drilling or digging activities or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MEC Evaluation/Investigation Needed

- No visual field reconnaissance of the Range Complex No. 1 AOC will be conducted with the objective to locate MEC; however, a visual will be completed to clear soil sample locations. The reconnaissance will be conducted by a

qualified UXO technician with the aid of a hand-held magnetometer or metal detector.

MC Evaluation

Types of MC

- Munitions debris from practice bombs consists primarily of light gauge sheet metal and cast iron. Iron is the primary constituent of sheet metal and cast iron. Other metals that may be present in sheet metal include aluminum, chromium, copper, lead, manganese, molybdenum, and nickel.
- Spotting charges or signals used with practice bombs at this AOC primarily consist of a black powder that contains potassium nitrate, sulfur, and charcoal. The BLU-95 contained ethylene oxide.
- Demolition charges C-4 and detonation cord contain explosives RDX and PETN.
- MC in the Turret Gunnery Training Range consists of metals from steel projectiles.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from training activities. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Surface Water: The nearest surface water is Carty Reservoir located approximately 6 miles southwest of the center of the range complex. Because of the distance, there is no complete surface water pathway.
- Sediment: Because of the distance to the nearest surface water, there is no complete pathway for sediment.
- Groundwater: Groundwater is a potentially affected media. There are potential receptors downgradient and outside of the FUDS boundary and the pathway is considered potentially complete. While no groundwater depths are available for Range Complex No. 1 area, thin perched groundwater layers above the basalt bedrock are possible, particularly with the irrigated farming that is occurring in the area. There is the potential for MC migration to groundwater. No groundwater drinking water wells are within the AOC.
- Groundwater is a potentially affected media since it is approximately 10 ft bgs at the site and migration of MC directly to the groundwater from the soil is considered to be possible.
- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at Range Complex No. 1 AOC include soil, groundwater, and air. A pathway evaluation for each media is discussed below and provided in Table 3.

Figures 3 and 9 illustrate the CSMs for Range Complex No. 1 AOC and potential pathways of MC contamination.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.
- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (Boeing, wildlife conservation, and agricultural).
- Wildlife.

MC Soil Evaluation/Investigation Needed

- Four soil samples will be collected from the Range Complex No. 1 AOC. Two soil samples will be collected from the Demolition Area and will be located near two of the detonation craters where a high density of munitions debris is present. The sampling locations will be selected following a visual reconnaissance conducted by a UXO technician aided by magnetometer. Samples will be analyzed for explosives (including nitroglycerin and PETN) and select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). The basis for this metals list is provided in "MC Soil Evaluation/Investigation Needed" for Target No. AOC.
- Two soil samples will be collected from the Turret Gunnery Range and analyzed for select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel) only. No explosive analysis is required as the range was only used for small arms firing.
- A soil sample was collected from INPR SITE No. 1 during the PA/SI and analyzed for metals, explosives, and perchlorate. Metals were not detected in significant concentrations and explosives and perchlorate were not detected. Additional soil samples are not required for this area.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (Boeing, wildlife conservation, and agricultural).

MC Groundwater Evaluation/Investigation Needed

- No additional groundwater samples will be collected from the Range Complex No. 1. The PA/SI addressed the groundwater pathway for the Boardman AFR, and sufficient data exist to assess groundwater. Groundwater samples were collected within and downgradient of the Boardman AFR. Sample results show that no explosive compounds were detected in any sample. However, perchlorate was detected in some wells. Metals were not included in the PA/SI analytical suite. However, the types of metals contained in munitions used at Range Complex No. 1 have a low solubility of the metals associated with munitions used at this AOC, the expected depth to groundwater (>40 ft), the thin occurrence of groundwater (few feet thick) would make it unlikely that impacts from metals would be noted. Therefore, metals are not considered a contaminant of concern for groundwater.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (Boeing, wildlife conservation, and agricultural).
- Wildlife.

MC Air Evaluation/Investigation Needed

- No air samples will be collected from the Boardman AFR. Analytical results from soil samples will be us used in the evaluation of the air pathway. The USEPA 2004 Region 9 PRGs incorporate dust exposure into the values and additional exposure data beyond soil data is not required.

Conceptual Site Model – Demolition Area No. 2 AOC

Demolition Area No. 2 is a newly identified AOC. The identification was made through interviews with a property leaseholder (The Nature Conservancy) and the Oregon State Police. The AOC consists of a number of detonation craters with munitions debris (Figure 10). Fuzes and munitions debris were recently destroyed by the Oregon State Police.

Current and Future Land Use

- Little is known of the Demolition Area No. 2 AOC and who used it.
- No groundwater wells are located within the boundary of this AOC.
- The land is currently used as a wildlife conservation area.
- Future land is expected to remain the same as current land use.

Former Range Use

- The area appears to have been used as an ordnance disposal/demolition area.
- It is unknown who was responsible for the demolition area.

Potential Contaminant Sources

- The likely munitions used at this AOC are:
    - M83 Butterfly bombs, M66 base detonator fuzes, 100-lb GP bomb base plate, C-4 blocks, detonation cord and time blasting fuze, and blasting caps both electric and non-electric.

MEC Evaluation

Types of MEC

- The types of munitions used at the Demolition Area No. 2 AOC are listed above. Debris from these munitions was located by employees of The Nature Conservancy who manage a portion of land for critical wildlife habitat.
- Ordnance disposal of the M83 Butterfly bomb was completed by the Oregon State Police in June 2006.
- The potential for UXO to be present at this AOC is high. This based on recent UXO finds in the area.

Surface Exposure Pathway

- The potential route of human exposure to MEC or munitions debris includes direct contact by vehicles, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure to MEC or munitions debris would be by intrusive drilling or digging activities or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MEC Evaluation/Investigation Needed

- No visual reconnaissance of Demolition Range No. 2 AOC is necessary. MEC and munitions debris has been identified at the AOC. Prior to collection of soil samples a visual MEC avoidance survey will be conducted by a qualified UXO technician with the aid of a hand-held magnetometer.

MC Evaluation

Types of MC

- Munitions debris from the M83 Butterfly Bombs consists primarily of light gauge sheet metal.
- Demolition charges C-4 and detonation cord contain explosives RDX and PETN.
- TNT is found in the M83 bomblets.
- Unidentified munitions destroyed at this site may have contained perchlorate but likely not in significant quantities.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from demolition activities. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Surface Water: The nearest surface water is Carty Reservoir, located approximately 4 miles to the southwest. Because of this distance, there is no complete surface water pathway.
- Sediment: Because of the distance to the nearest surface water, there is no complete pathway for sediment.
- Groundwater: Groundwater is a potentially affected media. There are potential receptors downgradient and outside of the FUDS boundary and the pathway is considered potentially complete. While no groundwater depths are available for Range Complex No. 1 AOC area, thin perched groundwater layers above the basalt bedrock are possible, particularly with the irrigated farming that is occurring in the area. There is the potential for MC migration to groundwater. No groundwater drinking water wells are within the AOC.

- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at the Demolition Area No. 2 AOC include soil, groundwater, and air. A pathway evaluation for each media is discussed below and provided in Table 3. Figure 9 illustrates the CSM for the Demolition Area No. 2 AOC.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.
- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (agricultural).
- Wildlife.

MC Soil Evaluation/Investigation Needed

- Two soil samples will be collected from the Demolition Area No. 2 AOC. A soil sample will be collected near two of the demolition craters. The sampling location will be selected following visual reconnaissance UXO survey utilizing a magnetometer to avoid UXO. Samples will be analyzed for explosives (including nitroglycerin and PETN) and select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). The basis for this metals list is provided in "MC Soil Evaluation/Investigation Needed" for Target No. AOC.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (agricultural).

MC Groundwater Evaluation/Investigation Needed

- No additional groundwater samples will be collected from this AOC. The PA/SI addressed the groundwater pathway for the Boardman AFR, and sufficient data exist to assess groundwater. Groundwater samples were

collected within and downgradient of the Boardman AFR. Sample results show that no explosive compounds were detected in any sample. However, perchlorate was detected in some wells. Metals were not included in the PA/SI analytical suite. However, the types of metals contained in munitions used at Demolition Area No. 2 have a low solubility of the metals associated with munitions used at this AOC, the expected depth to groundwater (>40 ft), the thin occurrence of groundwater (few feet thick) would make it unlikely that impacts from metals would be noted. Therefore, metals are not considered a contaminant of concern for groundwater.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (agricultural).
- Wildlife.

MC Air Evaluation/Investigation Needed

- No air samples will be collected from the Boardman AFR. Analytical results from soil samples will be us used in the evaluation of the air pathway. The USEPA 2004
  Region 9 PRGs incorporate dust exposure into the values and additional exposure data beyond soil data is not required.

Conceptual Site Model – Impact Area AOC

The Impact Area is a newly identified AOC. The identification was made through interviews with a property leaseholder (The Nature Conservancy). The AOC consists of a number of impact craters with a small amount of munitions debris (Figure 11). The AOC is locally known as the "Ship in the Desert". Impact craters are also visible on aerial photographs (Figure 11).

Current and Future Land Use

- Little is known of the Impact Area and who used it.
- One groundwater well is located approximately 1 mile south (upgradient) of the AOC.
- The land is currently used as a wildlife conservation area.
- Future land is expected to remain the same as current land use.

Former Range Use

- The area appears to have been used as an unofficial bomb target. Review of historical and recent aerial photographs does not indicate any established targets.
- The period of use is unknown.

Potential Contaminant Sources

- The potential munitions used at this AOC are:
- AN-Mk 5, AN-Mk 23, and AN-Mk 43 practice bombs. These practice bombs contained black powder and a red or white phosphorus pyrotechnic charge. The use of other practice bombs is possible.

MEC Evaluation

Types of MEC

- The types of munitions used at the Impact Area are listed above. The nature of the debris found at the AOC is unknown, however, it was described as only a small amount.
- The potential for UXO to be present at this AOC is moderate. This is based on suspected prior use as a practice bomb target.

Surface Exposure Pathway

- The potential route of human exposure to MEC or munitions debris includes direct contact by vehicles, foot traffic, or handling.
- The potential route of wildlife exposure to MEC or munitions debris would be by directly walking on them.

Subsurface Exposure Pathway

- The potential routes of human exposure to MEC or munitions debris would be by intrusive drilling or digging activities or geologic instability (erosion, freeze-thaw, etc.).
- The potential route of wildlife exposure to MEC or munitions debris would be by burrowing activities.

An analysis of the exposure pathways and receptors for MEC is provided in Table 3.

MEC Evaluation/Investigation Needed

- A visual field reconnaissance of the Impact Area will be complete to identify and MEC and munitions debris on the ground surface. The reconnaissance will be conducted by a qualified UXO technician with the aid of a hand-held magnetometer.

MC Evaluation

Types of MC

- Munitions debris is thought to be from AN-Mk 5, AN-Mk 23, and AN-Mk 43 practice bombs. The bomb consists of a cast iron body. These practice bombs contained black powder and a red or white phosphorus pyrotechnic charge. Additional munitions may have been used. Four reconnaissance transects are planed as shown on Figure 11.

Overview of Pathways

Affected media and potential pathways for MC include:

- Soil: Soil is the primary medium of concern because of possible MC in the soil from demolition activities. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Surface Water: Surface water is a potentially affected media. However the pathway is considered incomplete because, the upper portion of Sixmile Canyon Creek flows only during high precipitation events and the creek is dry much of the time.
- Sediment: Sediment is a potentially affected media. The upper portion of Sixmile Canyon Creek is adjacent to the AOC. However, flow is seasonal and the creek is dry much of the time.
- Groundwater: Groundwater is a potentially affected media. There are potential receptors downgradient and outside of the FUDS boundary and the pathway is considered potentially complete. While no groundwater depths are available for Range Complex No. 1 area, thin perched groundwater layers above the basalt bedrock are possible, particularly with the irrigated farming that is occurring in the area. There is the potential for MC migration to groundwater. No groundwater drinking water wells are within the AOC.

- Air: Air is a potential medium of concern because of the possibility of inhalation of contaminated soil particles. Blowing dust from the target could mobilize soil particles. This pathway is considered to be complete.

Exposure media at the Impact Area include soil, sediment, and air. A pathway evaluation for each media is discussed below and provided in Table 3. Figure 3 illustrates the CSM for the Impact Area.

Soil Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated soils include incidental ingestion of and dermal contact with contaminated media, as well as inhalation of soil particulates during intrusive work.
- The potential routes of wildlife exposure to contaminated soils include ingestion of and direct contact with contaminated media. Plants may uptake MC and then subsequently be eaten by wildlife. Burrowing animals may ingest MC-contaminated soil and subsequently be eaten by predators.

Receptors

- Workers (agricultural).
- Wildlife.

MC Soil Evaluation/Investigation Needed

- One soil sample will be collected from the Impact Area AOC. A soil sample will be collected near one of the impact craters where munitions debris is located. The sampling location will be selected following visual field reconnaissance utilizing a magnetometer. Samples will be analyzed for explosives (including nitroglycerin) and select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). The basis for this metals list is provided in "MC Soil Evaluation/Investigation Needed" for Target No. AOC.

Sediment Exposure Pathway

Exposure Routes

- The potential routes of human exposure to contaminated sediment include incidental ingestion of and dermal contact with sediment.
- The potential routes of wildlife exposure to contaminated sediment include ingestion of and direct contact with sediment.

Receptors

- Workers (agricultural).
- Wildlife.

MC Sediment Evaluation/Investigation Needed

- One sediment sample will be collected from this AOC. The sample will be collected from the bottom of the Sixmile Canyon Creek drainage at a probable point of entry. The sample will be analyzed for explosives (including nitroglycerin) and select metals (aluminum, chromium, copper, iron, lead, manganese, molybdenum, mercury, and nickel). This metals list is based on expected metals to be contained in the munitions (bomb casings, explosives, and fuzes) plus metals that may be used during background comparisons.

Groundwater Exposure Pathway

Exposure Routes

- The potential routes for human exposure to contaminated groundwater include ingestion, dermal contact, and inhalation where groundwater is used as a water supply.
- Direct exposure to wildlife is not a concern.

Receptors

- Workers (agricultural).

MC Groundwater Evaluation/Investigation Needed

- No additional groundwater samples will be collected from this AOC. The PA/SI addressed the groundwater pathway for the Boardman AFR, and sufficient data exist to assess groundwater. Groundwater samples were collected within and downgradient of the Boardman AFR. Sample results show that no explosive compounds were detected in any sample. However, perchlorate was detected in some wells. Metals were not included in the PA/SI analytical suite. However, the types of metals contained in munitions used at the Impact Area have a low solubility of the metals associated with munitions used at this AOC, the expected depth to groundwater (>40 ft), the thin occurrence of groundwater (few feet thick) would make it unlikely that impacts from metals would be noted. Therefore, metals are not considered a contaminant of concern for groundwater.

Air Exposure Pathway

Exposure Routes

- The potential route of human exposure to contaminated air includes inhalation during times of blowing dust.
- The potential route of wildlife exposure to contaminated air includes inhalation of air during times of blowing dust.

Receptors

- Workers (agricultural).
- Wildlife.

MC Air Evaluation/Investigation Needed

- No air samples will be collected from the Boardman AFR. Analytical results from soil samples will be us used in the evaluation of the air pathway. The USEPA 2004
  Region 9 PRGs incorporate dust exposure into the values and additional exposure data beyond soil data is not required.

Appendix K
Munitions Response Site Prioritization Protocol Evaluations

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site (MRS) Name:	**MRS No. 1**
Component:	US Army
Installation/Property Name:	**Boardman Air Force Range**
Location (City, County, State):	Morrow County, Oregon
UTM Coordinates (NAD83):	N 5063404, E 279733, Zone 11
Site Name (RMIS ID):	F10OR016001R01
Project Name (Project No.):	Formerly Used Defense Sites, Military Munitions Response Program Site Inspections at Multiple Sites (116188)
Date Information Entered/Updated:	10-Jul-2007
Point of Contact (Name/Phone):	Mike Nelson 206-764-3458

Project Phase ("X" only one):									
	PA	**X**	**SI**		**RI**		**FS**		**RD**
	RA-C		**RIP**		**RA-O**		**RC**		**LTM**

Media Evaluated ("X" all that apply):				
	X	**Groundwater (human receptor)**		**Sediment (human receptor)**
	X	**Surface soil (human receptor)**		**Surface water (ecological receptor)**
		Sediment (ecological receptor)		**Surface water (human receptor)**

MRS Summary

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present):

MRS No 1 - Target No. 1. Operational from 1942 to 1960. Boardman AFR was used as a practice bombing range for World War II, Korean War, and later practice bombing. The Boardman AFR consists of three individual targets and one range complex which included a bombing target, a demolition area, and a turret gunnery training range. Originally, the range was approximantely 95,985 acres. In 1963, the range was split in half with the eastern half being transfered to the Department of Navy for bombing range and the western half was transferred to the Department of Interior and the State of Oregon. The western half is the FUDS and the eastern half is still used by the Navy as an active bombing range (2007 SI Report, Section 2.1). Target No. 1 was used between 1948 and 1960, and was a replacement range for the original Target No. 1 (Carty Reservoir Bomb Target, MRS # 3). Approximately 40 percent of the former target is covered by Carty Reservoir. Munitions used at MRS No. 1 were AN-MK5, MK23, MK 43, w/ Mk4 signal charges, M38A2, and MK-76. Munitions constituents: metals (chromium, copper, iron, lead, molybdenum, and nickel), and explosives:black powder (2007 SI Rpt, Section 4.3). There were no exceedances of site background in soil samples (2007 SI Rpt, Section 4.4.1).

Description of Pathways for Human and Ecological Receptors:

Pathways evaluated include surface soil and groundwater. Exposure would be through ingestion or inhalation.

Description of Receptors (Human and Ecological):

Receptors in the area of Target No. 1 are workers and wildlife.

Table 1
EHE Module: Munitions Type Data Element Table

Directions: Below are eleven classifications of munitions and their descriptions. Annotate the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Sensitive	All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorous (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions].	30	
	All hand grenades containing energetic filler.		
	Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.		
High explosive (used or damaged)	All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."	25	
	All DMM containing a high-explosive filler that have been damaged by burning or detonation, or deteriorated to the point of instability.		
Pyrotechnic (used or damaged)	All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).	20	
	All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have been damaged by burning or detonation, or deteriorated to the point of instability.		
High explosive (unused)	All DMM containing a high-explosive filler that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	15	
Propellant	All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).	15	
	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are damaged by burning or detonation, or deteriorated to the point of instability.		
Bulk secondary high explosives, pyrotechnics, or propellant	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.	10	
	Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.		
Pyrotechnic (not used or damaged)	All DMM containing a pyrotechnic filler (i.e. red phosphorous), other than white phosphorous filler, that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	10	
Practice	All UXO that are practice munitions that are not associated with a sensitive fuze.	5	5
	All DMM that are practice munitions that are not associated with a sensitive fuze and that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.		
Riot control	All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3	
Small arms	All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	2	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space below.

All munitions debris found has been that of practice bombs AN-MK5, AN-MK 23, AN-MK 43, and MK 4 signal charge, M38A2, MK-76 (2007, Table 2-1). No sensitive explosive components were used at this MRS (2007 SI, Section 4.3). No MEC has been located at MRS. (2007 SI, Section 4.3).

Table 2

EHE Module: Source of Hazard Data Element Table

Directions: Below are eleven classifications describing sources of explosive hazards. Annotate the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range* , *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Former range	The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10	
Former munitions treatment (i.e. OB/OD) unit	The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8	
Former practice munitions range	The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6	6
Former maneuver area	The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5	
Former burial pit or other disposal area	The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5	
Former industrial operating facilities	The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4	
Former firing points	The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4	
Former missile or air defense artillery emplacements	The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2	
Former storage or transfer points	The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2	
Former small arms range	The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS iinto this category.].	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0	
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**6**

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space below.

This MRS is a former bombing target used for practice bombs, munitions debris from only practice munitions has been identified (2007 SI, Section 4.3).

Table 3
EHE Module: Location of Munitions Data Element Table

Directions: Below are eight classifications of munitions locations and their descriptions. Annotate the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface* , *subsurface* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Confirmed surface	Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	25	
Confirmed subsurface, active	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20	
Confirmed subsurface, stable	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15	
Suspected (physical evidence)	There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10	10
Suspected (historical evidence)	There is historical evidence indicating that UXO or DMM may be present at the MRS.	5	
Subsurface, physical constraint	There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2	
Small arms (regardless of location)	The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.]	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space below.

There have been no reported MEC at the MRS. Munitions debris from practice bombs (M38A2) has been confirmed during the 2007 SI (Section 4.3). INPR and PA/SI identified munitions debris (2007 SI, Section 4.3).

Table 4
EHE Module: Ease of Access Data Element Table

Directions: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Annotate the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
No barrier	There is no barrier preventing access to any part of the MRS (i.e. all parts of the MRS are accessible).	10	
Barrier to MRS access is incomplete	There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8	8
Barrier to MRS access is complete but not monitored	There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5	
Barrier to MRS access is complete and monitored	There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0	
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**8**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space below.

Portions of the MRS have restricted access, accessible by escort from the PGE power plant mangement. Other portions are open to general access (2007 SI, Section 4.3.2).

Table 5
EHE Module: Status of Property Data Element Table

Directions: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Annotate the score that corresponds with the status of property at the MRS.

Note: N/A

Classification	Description	Possible Score	Score
Non-DoD control	The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	5	5
Scheduled for transfer from DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3	
DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0	
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space below.

The MRS is located on privately owned land (2007 SI, Section 2.3).

Table 6

EHE Module: Population Density Data Element Table

Directions: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and annotate the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Possible Score	Score
> 500 persons per square mile	There are more than 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	5	
100 - 500 persons per square mile	There are 100 to 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	3	
< 100 persons per square mile	There are fewer than 100 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	1	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**1**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space below.

The 2000 Census data indicates that the population density for Morrow County is 5.4 persons per square mile with a total county population of 10,995 (2007 SI, Section 2.4.3).

Table 7
EHE Module: Population Near Hazard Data Element Table

Directions: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and annotate the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
26 or more inhabited structures	There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5	5
16 to 25 inhabited structures	There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4	
11 to 15 inhabited structures	There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3	
6 to 10 inhabited structures	There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2	
1 to 5 inhabited structures	There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1	
0 inhabited structures	There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0	
POPULATION NEAR HAZARI	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space below.

The recent aerial photography data indicate that there are an estimated 54 inhabitated structures within 2 miles of the MRS (2007 SI Report, Section 3.2.3).

Table 8

EHE Module: Types of Activities/Structures Data Element Table

Directions: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and annotate the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Residential, educational, commercial, or subsistence	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5	
Parks and recreational areas	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4	
Agricultural, forestry	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3	3
Industrial or warehousing	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2	2
No known or recurring activities	There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1	
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space below.

There are no residences, schools, or other critical assets within 2 miles of the MRS (2007 SI Report, Section 2.4.3). Portions of the MRS and surrounding area are used for irrigated farming and the PGE coal power plant is within 2 miles of the MRS (2007 SI Report, Section 4.1 and Figure 2-2).

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

Directions: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and annotate the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Ecological and cultural resources present	There are both ecological and cultural resources present on the MRS.	5	5
Ecological resources present	There are ecological resources present on the MRS.	3	
Cultural resources present	There are cultural resources present on the MRS.	3	
No ecological or cultural resources present	There are no ecological resources or cultural resources present on the MRS.	0	
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space below.

There are known archeological sites located within the MRS (2007 SI, 3.2.1). A portion of the MRS boarders on Carty Reservoir which contains wetlands (2007 SI Report Section 2.4.8 and Figure 2-6).

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 01 - 09, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.

4. Identify the appropriate range for the **EHE Module Total** at right.

5. Identify the **EHE Module Rating** that corresponds to the range selected and record this rating in the **EHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 01	5	11
Source of Hazard	Table 02	6	
Accessibility Factor Data Elements			
Location of Munitions	Table 03	10	23
Ease of Access	Table 04	8	
Status of Property	Table 05	5	
Receptor Factor Data Elements			
Population Density	Table 06	1	14
Population Near Hazard	Table 07	5	
Types of Activities/Structures	Table 08	3	
Ecological and/or Cultural Resources	Table 09	5	
EHE MODULE TOTAL			**48**

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**E**

Table 11

CHE Module: CWM Configuration Data Element Table

Directions: Below are seven classifications of CWM configuration and their descriptions. Annotate the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is (a) explosively configured CWM that are UXO (i.e. CWM/UXO), or (b) explosively configured CWM that are DMM (i.e. CWM/DMM) that have been damaged.	30	
CWM mixed with UXO	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25	
CWM, explosive configuration that are undamaged DMM	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20	
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is (a) nonexplosively configured CWM/DMM, or (b) bulk CWM/DMM (e.g., ton container).	15	
CAIS K941 and CAIS K942	The CWM/DMM known or suspected of being present at the MRS is CAIS K941(toxic gas set M-1) or CAIS K942 (toxic gas set M-2/E11).	12	
CAIS (chemical agent identification sets)	Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10	
Evidence of no CWM	Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space below.

There have been no reported use of CWM at the MRA

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11 - 19, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	0
Ease of Access	Table 14	0	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	0	0
Population Near Hazard	Table 17	0	
Types of Activities/Structures	Table 18	0	
Ecological and/or Cultural Resources	Table 19	0	
CHE MODULE TOTAL			**0**

4. Identify the appropriate range for the **CHE Module Total** at right.

5. Identify the **CHE Module Rating** that corresponds to the range selected and record this rating in the **CHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
Iron (7439-89-6)	50.00	11,000.00	0
		Total from Table 27	
		Sum the Ratios	0

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	**L**

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	**L**

Receptor Factor

Directions: Annotate the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	**L**
Place an "X" in the box to the right if there is no known or suspected Groundwater MC Hazard		

Table 22

HHE Module: Surface Water - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Human Endpoint) MC Hazard	**X**

Table 23

HHE Module: Sediment - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	**H (High)**
100 > CHF >2	**M (Medium)**
2 > CHF	**L (Low)**

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Human Endpoint) MC Hazard		**X**

Table 24

HHE Module: Surface Water - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use either dissolved or total metals analyses.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Ecological Endpoint) MC Hazard	**X**

Table 25

HHE Module: Sediment - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Sediment (Ecological Endpoint) MC Hazard	**X**

Table 26

HHE Module: Surface Soil - Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Soil MC Hazard	**X**

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

Directions: **Only use this table if there are more than five contaminants present at the MRS.** This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: For human exposures to groundwater and surface water, use dissolved, rather than total, metals analyses when both are available. Remember not to add ratios from different media.

Media	Contaminant [CAS No.]	Maximum Concentration	Units	Comparison Value	Units	Ratios
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
				SUBTOTAL FOR SURFACE SOIL		**0**
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
				SUBTOTAL FOR SEDIMENT		**0**
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
				SUBTOTAL FOR SURFACE WATER		**0**
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
				SUBTOTAL FOR GROUNDWATER		**0**

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21 - 26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter-Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each medium's rating (A - G) and record the letter in the corresponding **Media Rating** box below.

Medium (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A - G)
Table 21 - Groundwater	L	L	L	LLL	G
Table 22 - Surface Water (Human Endpoint)					
Table 23 - Sediment (Human Endpoint)					
Table 24 - Surface Water (Ecological Endpoint)					
Table 25 - Sediment (Ecological Endpoint)					
Table 26 - Surface Soil					
			HHE MODULE RATING		**G**

DIRECTIONS (Continued):

4. Select the single highest **Media Rating** (A is the highest; G is the lowest) and enter the letter in the **HHE Module Rating** box below.

HHE Ratings (for reference only)	
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

NOTE: An alternative module rating may be assigned when a module letter rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Alternative Module Ratings
Evaluation Pending
No Longer Required
No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, enter the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Enter the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

NOTE: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Reference Table 10:		Reference Table 20:		Reference Table 28:	
EHE Module Rating	Priority	CHE Module Rating	Priority	HHE Module Rating	Priority
E	6	No Known or Suspected CWM Hazard	No Known or Suspected CWM Hazard	G	8

MRS or Alternative Priority	6

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site (MRS) Name:	**MRS No. 2**
Component:	US Army
Installation/Property Name:	**Boardman Air Force Range**
Location (City, County, State):	Morrow County, Oregon
UTM Coordinates (NAD83):	N 5072555, E 280149, Zone 11
Site Name (RMIS ID):	F10OR016001R02
Project Name (Project No.):	Formerly Used Defense Sites, Military Munitions Response Program Site Inspections at Multiple Sites (116188)
Date Information Entered/Updated:	10-Jul-2007
Point of Contact (Name/Phone):	Mike Nelson 206-764-3458

Project Phase ("X" only one):								
	PA	**X**	**SI**		**RI**		**FS**	**RD**
	RA-C		**RIP**		**RA-O**		**RC**	**LTM**

Media Evaluated ("X" all that apply):				
		Groundwater (human receptor)		**Sediment (human receptor)**
	X	**Surface soil (human receptor)**		**Surface water (ecological receptor)**
		Sediment (ecological receptor)		**Surface water (human receptor)**

MRS Summary

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present):

MRS No. 2 is also known as Target No. 2. Boardman AFR was operational from 1942 to 1960. The Boardman AFR was used as a practice bombing range for World War II, Korean War, and later practice bombing. Boardman AFR consists of three individual targets and one range complex that included a bombing target, a demolition area, and a turret gunnery training range. Originally, the range was approximately 95,985 acres. In 1963, the range was split in half with the eastern half being transfered to the Department of Navy for bombing range and the western half was transferred to the Department of Interior and the State of Oregon. The western half is the FUDS and the eastern half is still used by the Navy as an active bombing range. The Target No. 2 was used between 1942 and 1960. Currently, the MRS is used for irrigated farming. Munitions were practice bombs (AN-47, AN-M57 GP, MK-15 Mod 3, M38A2), incendiary round (AN-M50), and 2.25 rockets (MK-6). MEC has been reported as recently as Spring 2006 and consisted of AN-M57 GP practice bombs. Munitions debris has been found in the MRS (SI, Section 5.3). MC: metals, explosives - black powder (2007 SI Section 5.4). No MC background exceedances (2007 SI, Section 5.4).

Description of Pathways for Human and Ecological Receptors:

Pathways evaluated include surface soil. Exposure would be through ingestion or inhalation.

Description of Receptors (Human and Ecological):

Receptors in the area of Target No. 2 are workers and wildlife.

Table 1
EHE Module: Munitions Type Data Element Table

Directions: Below are eleven classifications of munitions and their descriptions. Annotate the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Sensitive	All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorous (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions].	30	30
	All hand grenades containing energetic filler.		
	Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.		
High explosive (used or damaged)	All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."	25	
	All DMM containing a high-explosive filler that have been damaged by burning or detonation, or deteriorated to the point of instability.		
Pyrotechnic (used or damaged)	All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).	20	
	All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have been damaged by burning or detonation, or deteriorated to the point of instability.		
High explosive (unused)	All DMM containing a high-explosive filler that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	15	
Propellant	All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).	15	
	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are damaged by burning or detonation, or deteriorated to the point of instability.		
Bulk secondary high explosives, pyrotechnics, or propellant	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.	10	
	Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.		
Pyrotechnic (not used or damaged)	All DMM containing a pyrotechnic filler (i.e. red phosphorous), other than white phosphorous filler, that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	10	
Practice	All UXO that are practice munitions that are not associated with a sensitive fuze.	5	5
	All DMM that are practice munitions that are not associated with a sensitive fuze and that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.		
Riot control	All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3	
Small arms	All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	2	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**30**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space below.

All MEC and munitions debris found has been that of practice bombs (AN-M50A2 indendiary bomb, AN-M52 indendiary bomb, M38A2, AN-M47, AN-M57 GP, MK-15 Mod 3 practice bombs) and 2.25-inch Practice Rocket (2007 SI Section 5.3). All bombs used at this target contained nonsensitive components, except for the AN-M47 that may contain a sensitive fuze (2007 SI, Section 4.3).

Table 2

EHE Module: Source of Hazard Data Element Table

Directions: Below are eleven classifications describing sources of explosive hazards. Annotate the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range* , *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Former range	The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10	10
Former munitions treatment (i.e. OB/OD) unit	The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8	
Former practice munitions range	The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6	6
Former maneuver area	The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5	
Former burial pit or other disposal area	The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5	
Former industrial operating facilities	The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4	
Former firing points	The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4	
Former missile or air defense artillery emplacements	The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2	
Former storage or transfer points	The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2	
Former small arms range	The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS iinto this category.].	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0	
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space below.

This MRS is a former bombing target used for practice bombing. MEC and munitions debris only from practice munitions have been identified (2007 SI, Section 5.3). All bombs used at this target contained nonsensitive components, except for the AN-M47 that may contain a sensitive fuze (2007 SI, Section 5.3).

Table 3
EHE Module: Location of Munitions Data Element Table

Directions: Below are eight classifications of munitions locations and their descriptions. Annotate the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface* , *subsurface* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Confirmed surface	Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	25	
Confirmed subsurface, active	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20	
Confirmed subsurface, stable	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15	15
Suspected (physical evidence)	There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10	
Suspected (historical evidence)	There is historical evidence indicating that UXO or DMM may be present at the MRS.	5	
Subsurface, physical constraint	There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2	
Small arms (regardless of location)	The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.]	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).		**15**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space below.

MEC (M38A2 practice bombs) has been reported as recently as Spring 2006 at the MRS (2007 SI, Section 5.3). MEC are recovered through deep tilling of the soil for agricultural purposes (2007 SI, section 5.3.1).

Table 4
EHE Module: Ease of Access Data Element Table

Directions: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Annotate the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
No barrier	There is no barrier preventing access to any part of the MRS (i.e. all parts of the MRS are accessible).	10	10
Barrier to MRS access is incomplete	There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8	
Barrier to MRS access is complete but not monitored	There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5	
Barrier to MRS access is complete and monitored	There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0	
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space below.

The MRS is within an area of irrigated agriculture and accessible to the general public (2007 SI, Section 5.3.2).

Table 5
EHE Module: Status of Property Data Element Table

Directions: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Annotate the score that corresponds with the status of property at the MRS.

Note: N/A

Classification	Description	Possible Score	Score
Non-DoD control	The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	5	5
Scheduled for transfer from DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3	
DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0	
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space below.

The MRS is located on privately owned land (2007 SI, Section 2.3).

Table 6

EHE Module: Population Density Data Element Table

Directions: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and annotate the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Possible Score	Score
> 500 persons per square mile	There are more than 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	5	
100 - 500 persons per square mile	There are 100 to 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	3	
< 100 persons per square mile	There are fewer than 100 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	1	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**1**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space below.

The 2000 Census data indicate that the population density for Morrow County is 5.4 persons per square mile with a total county population of 10,995 (2007 SI, Section 2.4.3).

Table 7
EHE Module: Population Near Hazard Data Element Table

Directions: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and annotate the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
26 or more inhabited structures	There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5	
16 to 25 inhabited structures	There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4	
11 to 15 inhabited structures	There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3	3
6 to 10 inhabited structures	There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2	
1 to 5 inhabited structures	There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1	
0 inhabited structures	There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0	
POPULATION NEAR HAZARI	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 5).		**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space below.

The recent aerial photography data indicate that there are an estimated 11 inhabitated structures within 2 miles of the MRS (2007 SI Report, Section 3.2.3).

Table 8

EHE Module: Types of Activities/Structures Data Element Table

Directions: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and annotate the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Residential, educational, commercial, or subsistence	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5	
Parks and recreational areas	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4	
Agricultural, forestry	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3	3
Industrial or warehousing	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2	
No known or recurring activities	There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1	
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space below.

There are no residences, schools, or other critical assets within 2 miles of the MRS (2007 SI Report, Section 2.4.3). Portions of the MRS and surrounding area are used for irrigated farming (2007 SI Report, Section 5.1).

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

Directions: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and annotate the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Ecological and cultural resources present	There are both ecological and cultural resources present on the MRS.	5	
Ecological resources present	There are ecological resources present on the MRS.	3	
Cultural resources present	There are cultural resources present on the MRS.	3	
No ecological or cultural resources present	There are no ecological resources or cultural resources present on the MRS.	0	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space below.

There are no known archeological sites located within the MRS. The Oregon State Historic Preservation Office stated that two general areas were in the vicintiy of MRSs (AOCs) but that no area was within the MRS (2007 SI, 3.2.1). The MRS is used for irrigated agricultural purposes and no area within the MRS is managed for ecological resources (2007 SI, Section 2.4.8, Figure 2-6).

Table 10

Determining the EHE Module Rating

		Source	Score	Value
DIRECTIONS:	**Explosive Hazard Factor Data Elements**			
1. From Tables 01 - 09, record the data element scores in the **Score** boxes to the right.	Munitions Type	Table 01	30	40
	Source of Hazard	Table 02	10	
	Accessibility Factor Data Elements			
	Location of Munitions	Table 03	15	30
	Ease of Access	Table 04	10	
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.	Status of Property	Table 05	5	
	Receptor Factor Data Elements			
	Population Density	Table 06	1	7
	Population Near Hazard	Table 07	3	
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.	Types of Activities/Structures	Table 08	3	
	Ecological and/or Cultural Resources	Table 09	0	
	EHE MODULE TOTAL			**77**

	EHE Module Total	**EHE Module Rating**
4. Identify the appropriate range for the **EHE Module Total** at right.	92 to 100	A
	82 to 91	B
	71 to 81	C
	60 to 70	D
5. Identify the **EHE Module Rating** that corresponds to the range selected and record this rating in the **EHE Module Rating** box at the lower right corner of this table.	48 to 59	E
	38 to 47	F
	less than 38	G
NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Alternative Module Ratings	Evaluation Pending
		No Longer Required
		No Known or Suspected Explosive Hazard
	EHE MODULE RATING	**C**

Table 11

CHE Module: CWM Configuration Data Element Table

Directions: Below are seven classifications of CWM configuration and their descriptions. Annotate the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is (a) explosively configured CWM that are UXO (i.e. CWM/UXO), or (b) explosively configured CWM that are DMM (i.e. CWM/DMM) that have been damaged.	30	
CWM mixed with UXO	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25	
CWM, explosive configuration that are undamaged DMM	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20	
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is (a) nonexplosively configured CWM/DMM, or (b) bulk CWM/DMM (e.g., ton container).	15	
CAIS K941 and CAIS K942	The CWM/DMM known or suspected of being present at the MRS is CAIS K941(toxic gas set M-1) or CAIS K942 (toxic gas set M-2/E11).	12	
CAIS (chemical agent identification sets)	Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10	
Evidence of no CWM	Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space below.

There have been no reported used of CWM at the MRA

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11 - 19, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	0
Ease of Access	Table 14	0	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	0	0
Population Near Hazard	Table 17	0	
Types of Activities/Structures	Table 18	0	
Ecological and/or Cultural Resources	Table 19	0	
CHE MODULE TOTAL			**0**

4. Identify the appropriate range for the **CHE Module Total** at right.

5. Identify the **CHE Module Rating** that corresponds to the range selected and record this rating in the **CHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Groundwater MC Hazard		**X**

Table 22

HHE Module: Surface Water - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Human Endpoint) MC Hazard	**X**

Table 23

HHE Module: Sediment - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Human Endpoint) MC Hazard		**X**

Table 24

HHE Module: Surface Water - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use either dissolved or total metals analyses.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Ecological Endpoint) MC Hazard	**X**

Table 25

HHE Module: Sediment - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Sediment (Ecological Endpoint) MC Hazard	**X**

Table 26

HHE Module: Surface Soil - Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	

CHF Scale	CHF Value	Sum the Ratios
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Soil MC Hazard	**X**

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

Directions: **Only use this table if there are more than five contaminants present at the MRS.** This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: For human exposures to groundwater and surface water, use dissolved, rather than total, metals analyses when both are available. Remember not to add ratios from different media.

Media	Contaminant [CAS No.]	Maximum Concentration	Units	Comparison Value	Units	Ratios
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
				SUBTOTAL FOR SURFACE SOIL		**0**
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
				SUBTOTAL FOR SEDIMENT		**0**
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
				SUBTOTAL FOR SURFACE WATER		**0**
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
				SUBTOTAL FOR GROUNDWATER		**0**

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21 - 26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter-Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each medium's rating (A - G) and record the letter in the corresponding **Media Rating** box below.

Medium (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A - G)
Table 21 - Groundwater					
Table 22 - Surface Water (Human Endpoint)					
Table 23 - Sediment (Human Endpoint)					
Table 24 - Surface Water (Ecological Endpoint)					
Table 25 - Sediment (Ecological Endpoint)					
Table 26 - Surface Soil					
			HHE MODULE RATING		**No Known or Suspected MC Hazard**

DIRECTIONS (Continued):

4. Select the single highest **Media Rating** (A is the highest; G is the lowest) and enter the letter in the **HHE Module Rating** box below.

HHE Ratings (for reference only)	
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

NOTE: An alternative module rating may be assigned when a module letter rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Alternative Module Ratings
Evaluation Pending
No Longer Required
No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, enter the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Enter the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

NOTE: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Reference Table 10:		Reference Table 20:		Reference Table 28:	
EHE Module Rating	Priority	CHE Module Rating	Priority	HHE Module Rating	Priority
C	4	No Known or Suspected CWM Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected MC Hazard

MRS or Alternative Priority	4

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site (MRS) Name:	**MRS No. 3**
Component:	US Army
Installation/Property Name:	**Boardman Air Force Range**
Location (City, County, State):	Morrow County, Oregon
UTM Coordinates (NAD83):	N 5061866, E 279539, Zone 11
Site Name (RMIS ID):	F10OR016001R03
Project Name (Project No.):	Formerly Used Defense Sites, Military Munitions Response Program Site Inspections at Multiple Sites (116188)
Date Information Entered/Updated:	10-Jul-2007
Point of Contact (Name/Phone):	Mike Nelson 206-764-3458

Project Phase ("X" only one):										
	PA	**X**	**SI**		**RI**		**FS**		**RD**	
	RA-C		**RIP**		**RA-O**		**RC**		**LTM**	

Media Evaluated ("X" all that apply):					
	Groundwater (human receptor)	**X**	**Sediment (human receptor)**		
X	**Surface soil (human receptor)**	**X**	**Surface water (ecological receptor)**		
X	**Sediment (ecological receptor)**	**X**	**Surface water (human receptor)**		

MRS Summary

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present):

MRS No. 3 - Carty Reservoir Bomb Target. Operational from 1942 to 1960. Used as a practice bombing range for World War II, Korean War, and later practice bombing. Consists of three individual targets and one range complex (bombing target, demolition area, and turret gunnery training range). Orginally, the range was approximately 95,985 acres. In 1963, the range was divided with the eastern half being transfered to the Department of Navy for bombing range and the western half was transfered to the Department of Interior and the State of Oregon. The western half is the FUDS and the eastern half is still used as an active bombing range. MRS #3 used between 1942 and 1945. Currently used for irrigated farming, managed ecological area, a portion is flooded by Carty Reservoir. Munitions used at MRS No. 3 were MK 23, M38A2, and M89 practice bombs, M75/M84 target marker bomb. MEC was reported in the ASR (ASR, pg 22). Munitions debris has been found in the MRA (2007 SI, Section 6.3). MC consists of metals (chromium, copper, iron, lead, molybdenum, and nickel), explosives are black powder (2007 SI, Section 6.4). There were no background exceedances for metals, no detections of explosives in soil and sediment, no detections of perchlorate in surface water (2007 SI, Section 6.4).

Description of Pathways for Human and Ecological Receptors:

Pathways evaluated include surface soil, sediment and surface water. Exposure would be through ingestion or inhalation.

Description of Receptors (Human and Ecological):

Receptors in the area of Carty Reservoir Bomb Target are workers and wildlife.

Table 1
EHE Module: Munitions Type Data Element Table

Directions: Below are eleven classifications of munitions and their descriptions. Annotate the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Sensitive	All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorous (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions].	30	30
	All hand grenades containing energetic filler.		
	Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.		
High explosive (used or damaged)	All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."	25	
	All DMM containing a high-explosive filler that have been damaged by burning or detonation, or deteriorated to the point of instability.		
Pyrotechnic (used or damaged)	All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).	20	
	All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have been damaged by burning or detonation, or deteriorated to the point of instability.		
High explosive (unused)	All DMM containing a high-explosive filler that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	15	
Propellant	All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).	15	
	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are damaged by burning or detonation, or deteriorated to the point of instability.		
Bulk secondary high explosives, pyrotechnics, or propellant	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.	10	
	Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.		
Pyrotechnic (not used or damaged)	All DMM containing a pyrotechnic filler (i.e. red phosphorous), other than white phosphorous filler, that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	10	
Practice	All UXO that are practice munitions that are not associated with a sensitive fuze.	5	5
	All DMM that are practice munitions that are not associated with a sensitive fuze and that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.		
Riot control	All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3	
Small arms	All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	2	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**30**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space below.

All MEC and munitions debris found has been that of practice bombs AN-Mk 23, M38A2, M75/M84, M89 (2007 SI, Section 6.3). The M75/M84 target marker bombs contained a sensitive fuzing (2007 SI, Section 6.3).

Table 2

EHE Module: Source of Hazard Data Element Table

Directions: Below are eleven classifications describing sources of explosive hazards. Annotate the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range* , *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Former range	The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10	10
Former munitions treatment (i.e. OB/OD) unit	The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8	
Former practice munitions range	The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6	6
Former maneuver area	The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5	
Former burial pit or other disposal area	The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5	
Former industrial operating facilities	The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4	
Former firing points	The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4	
Former missile or air defense artillery emplacements	The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2	
Former storage or transfer points	The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2	
Former small arms range	The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS iinto this category.].	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0	
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space below.

This MRS is a former bombing target used for practice bombs, munitions debris from only practice munitions has been identified (2007 SI, Section 6.3). The M75/M84 target marker bombs contained a sensitive fuzing (2007 SI, Section 6.3).

Table 3
EHE Module: Location of Munitions Data Element Table

Directions: Below are eight classifications of munitions locations and their descriptions. Annotate the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface* , *subsurface* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Confirmed surface	Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	25	
Confirmed subsurface, active	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20	
Confirmed subsurface, stable	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15	15
Suspected (physical evidence)	There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10	
Suspected (historical evidence)	There is historical evidence indicating that UXO or DMM may be present at the MRS.	5	
Subsurface, physical constraint	There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2	
Small arms (regardless of location)	The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.]	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).		**15**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space below.

MEC was reported and destroyed during the ASR in 1997 at the MRS (ASR, Appendix M2). Munitions debris from practice bombs has been reported at the MRS (2007 SI, Section 6.3). The M75/M84 target marker bombs contained a sensitive fuzing (2007 SI, Section 6.3).

Table 4
EHE Module: Ease of Access Data Element Table

Directions: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Annotate the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
No barrier	There is no barrier preventing access to any part of the MRS (i.e. all parts of the MRS are accessible).	10	
Barrier to MRS access is incomplete	There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8	8
Barrier to MRS access is complete but not monitored	There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5	
Barrier to MRS access is complete and monitored	There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0	
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**8**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space below.

Portions of the MRS have restricted access, accessible by escort from the PGE power plant mangement; other portions are open to general access (2007 SI, Section 6.3.2).

Table 5
EHE Module: Status of Property Data Element Table

Directions: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Annotate the score that corresponds with the status of property at the MRS.

Note: N/A

Classification	Description	Possible Score	Score
Non-DoD control	The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	5	5
Scheduled for transfer from DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3	
DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0	
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space below.

The MRS is located on privately owned land (2007 SI, Section 2.3).

Table 6

EHE Module: Population Density Data Element Table

Directions: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and annotate the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Possible Score	Score
> 500 persons per square mile	There are more than 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	5	
100 - 500 persons per square mile	There are 100 to 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	3	
< 100 persons per square mile	There are fewer than 100 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	1	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**1**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space below.

The 2000 Census data indicates that the population density for Morrow County is 5.4 persons per square mile with a total county population of 10,995 (2007 SI, Section 2.4.3).

Table 7
EHE Module: Population Near Hazard Data Element Table

Directions: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and annotate the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
26 or more inhabited structures	There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5	5
16 to 25 inhabited structures	There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4	
11 to 15 inhabited structures	There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3	
6 to 10 inhabited structures	There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2	
1 to 5 inhabited structures	There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1	
0 inhabited structures	There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0	
POPULATION NEAR HAZARI	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space below.

The recent aerial photography data indicate that there are an estimated 54 inhabitated structures within 2 miles of the MRS (2007 SI Report, Section 3.2.3).

Table 8

EHE Module: Types of Activities/Structures Data Element Table

Directions: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and annotate the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Residential, educational, commercial, or subsistence	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5	
Parks and recreational areas	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4	
Agricultural, forestry	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3	3
Industrial or warehousing	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2	2
No known or recurring activities	There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1	
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space below.

There are no residences, schools, or other critical assets within 2 miles of the MRS (2007 SI Report, Section 2.4.3). Portions of the MRS and surrounding area are used for irrigated farming and the PGE coal power plant is within 2 miles of the MRS (2007 SI Report, Section 6.1 and Figure 2-2).

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

Directions: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and annotate the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Ecological and cultural resources present	There are both ecological and cultural resources present on the MRS.	5	5
Ecological resources present	There are ecological resources present on the MRS.	3	
Cultural resources present	There are cultural resources present on the MRS.	3	
No ecological or cultural resources present	There are no ecological resources or cultural resources present on the MRS.	0	
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space below.

There are no known archeological sites located within the MRS (2007 SI, 3.2.1). Portions of the MRS are managed for ecological resources by The Nature Conservancy (2007 SI, Section 2.4.8, 6.1, Figure 2-6).

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 01 - 09, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.

4. Identify the appropriate range for the **EHE Module Total** at right.

5. Identify the **EHE Module Rating** that corresponds to the range selected and record this rating in the **EHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 01	30	40
Source of Hazard	Table 02	10	
Accessibility Factor Data Elements			
Location of Munitions	Table 03	15	28
Ease of Access	Table 04	8	
Status of Property	Table 05	5	
Receptor Factor Data Elements			
Population Density	Table 06	1	14
Population Near Hazard	Table 07	5	
Types of Activities/Structures	Table 08	3	
Ecological and/or Cultural Resources	Table 09	5	
EHE MODULE TOTAL			**82**

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**B**

Table 11

CHE Module: CWM Configuration Data Element Table

Directions: Below are seven classifications of CWM configuration and their descriptions. Annotate the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is (a) explosively configured CWM that are UXO (i.e. CWM/UXO), or (b) explosively configured CWM that are DMM (i.e. CWM/DMM) that have been damaged.	30	
CWM mixed with UXO	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25	
CWM, explosive configuration that are undamaged DMM	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20	
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is (a) nonexplosively configured CWM/DMM, or (b) bulk CWM/DMM (e.g., ton container).	15	
CAIS K941 and CAIS K942	The CWM/DMM known or suspected of being present at the MRS is CAIS K941(toxic gas set M-1) or CAIS K942 (toxic gas set M-2/E11).	12	
CAIS (chemical agent identification sets)	Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10	
Evidence of no CWM	Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space below.

There have been no reported use of CWM at the MRS

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11 - 19, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	0
Ease of Access	Table 14	0	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	0	0
Population Near Hazard	Table 17	0	
Types of Activities/Structures	Table 18	0	
Ecological and/or Cultural Resources	Table 19	0	
CHE MODULE TOTAL			**0**

4. Identify the appropriate range for the **CHE Module Total** at right.

5. Identify the **CHE Module Rating** that corresponds to the range selected and record this rating in the **CHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Groundwater MC Hazard		**X**

Table 22

HHE Module: Surface Water - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Human Endpoint) MC Hazard	**X**

Table 23

HHE Module: Sediment - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	**H (High)**
100 > CHF >2	**M (Medium)**
2 > CHF	**L (Low)**

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Human Endpoint) MC Hazard		**X**

Table 24

HHE Module: Surface Water - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use either dissolved or total metals analyses.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Ecological Endpoint) MC Hazard	**X**

Table 25

HHE Module: Sediment - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	

CHF Scale	CHF Value	Sum the Ratios
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Sediment (Ecological Endpoint) MC Hazard	**X**

Table 26

HHE Module: Surface Soil - Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	

CHF Scale	CHF Value	Sum the Ratios
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Soil MC Hazard	**X**

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

Directions: **Only use this table if there are more than five contaminants present at the MRS.** This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: For human exposures to groundwater and surface water, use dissolved, rather than total, metals analyses when both are available. Remember not to add ratios from different media.

Media	Contaminant [CAS No.]	Maximum Concentration	Units	Comparison Value	Units	Ratios
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
				SUBTOTAL FOR SURFACE SOIL		**0**
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
				SUBTOTAL FOR SEDIMENT		**0**
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
				SUBTOTAL FOR SURFACE WATER		**0**
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
				SUBTOTAL FOR GROUNDWATER		**0**

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21 - 26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter-Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each medium's rating (A - G) and record the letter in the corresponding **Media Rating** box below.

Medium (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A - G)
Table 21 - Groundwater					
Table 22 - Surface Water (Human Endpoint)					
Table 23 - Sediment (Human Endpoint)					
Table 24 - Surface Water (Ecological Endpoint)					
Table 25 - Sediment (Ecological Endpoint)					
Table 26 - Surface Soil					
			HHE MODULE RATING		**No Known or Suspected MC Hazard**

DIRECTIONS (Continued):

4. Select the single highest **Media Rating** (A is the highest; G is the lowest) and enter the letter in the **HHE Module Rating** box below.

HHE Ratings (for reference only)	
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

NOTE: An alternative module rating may be assigned when a module letter rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Alternative Module Ratings
Evaluation Pending
No Longer Required
No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, enter the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Enter the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

NOTE: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Reference Table 10:		Reference Table 20:		Reference Table 28:	
EHE Module Rating	Priority	CHE Module Rating	Priority	HHE Module Rating	Priority
B	3	No Known or Suspected CWM Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected MC Hazard

MRS or Alternative Priority	3

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site (MRS) Name:	**MRS No. 4**
Component:	US Army
Installation/Property Name:	**Boardman Air Force Range**
Location (City, County, State):	Morrow County, Oregon
UTM Coordinates (NAD83):	N 5072555, E 280149, Zone 11
Site Name (RMIS ID):	F10OR016001R04
Project Name (Project No.):	Formerly Used Defense Sites, Military Munitions Response Program Site Inspections at Multiple Sites (116188)
Date Information Entered/Updated:	10-Jul-2007
Point of Contact (Name/Phone):	Mike Nelson 206-764-3458

Project Phase ("X" only one):								
	PA	**X**	**SI**		**RI**		**FS**		**RD**
	RA-C		**RIP**		**RA-O**		**RC**		**LTM**

Media Evaluated ("X" all that apply):				
		Groundwater (human receptor)		**Sediment (human receptor)**
	X	**Surface soil (human receptor)**		**Surface water (ecological receptor)**
		Sediment (ecological receptor)		**Surface water (human receptor)**

MRS Summary

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present):

MRS No. 4 - Range Complex No. 1. Operational from 1942 to 1960. Used as a practice bombing range for World War II, Korean War, and later. Consists of three individual targets and one range complex (bombing target, demolition area, turret gunnery training range). Orginally the range was approximately 95,985 acres. In 1963, the range was split, with the eastern half transfered to the Department of Navy for bombing range and western half transfered to Department of Interior and State of Oregon. Western half is the FUDS. Eastern half is used by the Navy as an active bombing range. MRS #4 used between 1946 and 1960. The MRS consists of three subranges: INPR Site No. 1, Demolition Area, and Turret Gunnery Training Range. Currently, the MRS is used for irrigated farming, managed ecological area, and antennae test range. Munitions used at MRS No. 4 were practice bombs and demolition charges of other munitions (2007 SI, Section 7.3, Table 2-1). No MEC but significant MD has been reported at INPR Site No. 1 and Demolition Area (2007 SI Section 7.3). MC: metals (chromium, copper, iron, lead, molybdenum, and nickel) and explosives (RDX, PETN and black powder) (2007 SI, Section 7.3). No background exceedances and no detections of explosives or perchlorate (2007 SI, Section 7.4).

Description of Pathways for Human and Ecological Receptors:

Pathways evaluated include surface soil. Exposure would be through ingestion or inhalation.

Description of Receptors (Human and Ecological):

Receptors in the area of Range Complex No. 1 are workers and wildlife.

Table 1
EHE Module: Munitions Type Data Element Table

Directions: Below are eleven classifications of munitions and their descriptions. Annotate the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Sensitive	All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorous (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions].	30	30
	All hand grenades containing energetic filler.		
	Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.		
High explosive (used or damaged)	All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."	25	25
	All DMM containing a high-explosive filler that have been damaged by burning or detonation, or deteriorated to the point of instability.		
Pyrotechnic (used or damaged)	All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).	20	
	All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have been damaged by burning or detonation, or deteriorated to the point of instability.		
High explosive (unused)	All DMM containing a high-explosive filler that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	15	15
Propellant	All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).	15	15
	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are damaged by burning or detonation, or deteriorated to the point of instability.		
Bulk secondary high explosives, pyrotechnics, or propellant	All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.	10	10
	Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.		
Pyrotechnic (not used or damaged)	All DMM containing a pyrotechnic filler (i.e. red phosphorous), other than white phosphorous filler, that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	10	10
Practice	All UXO that are practice munitions that are not associated with a sensitive fuze.	5	5
	All DMM that are practice munitions that are not associated with a sensitive fuze and that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.		
Riot control	All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3	
Small arms	All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	2	2
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**30**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space below.

INPR Site No. 1 was used as a practice bombing target. Munitions debris identifed at the target were BDU-33, Mk-84, Mark -12 practice nuclear bomb, Mk-106, Mk-89 (2007 SI, Section 7.3). A BLU-73 fuel-air explosive bomb was found in INPR Site No. 1 (PA/SI, 2004). It was a likely drift over from the adjacent active Navy bombing range (2007 SI, Section 7.3). The Demolition Area has a large density of munitions debris in and surrounding demolition pits (2007 SI, Section 7.3). Due to the potential for drift from the adjacent Navy bombing range, the potential for munitions with sensitive fuzes exists. A wide variety of munitions may have been destroyed at the Demolition Area. No debris was observed at the Turret Gunnery Training Range, which used .30-caliber ammunition (2007 SI, Section 7.3). Munitions used/destroyed at INPR Site contained sensitive components (SI, Section 7.3).

Table 2

EHE Module: Source of Hazard Data Element Table

Directions: Below are eleven classifications describing sources of explosive hazards. Annotate the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range* , *practice munitions* , *small arms* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Former range	The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10	10
Former munitions treatment (i.e. OB/OD) unit	The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8	8
Former practice munitions range	The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6	6
Former maneuver area	The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5	
Former burial pit or other disposal area	The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5	
Former industrial operating facilities	The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4	
Former firing points	The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4	
Former missile or air defense artillery emplacements	The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2	
Former storage or transfer points	The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2	
Former small arms range	The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS iinto this category.].	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0	
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space below.

This MRS is a former bombing target used for practice bombs (INPR Site No. 1), a munitions demolition area (Demolition Area), and small arms training area (Turret Gunnery Training Range). Munitions used/destroyed at INPR Site contained sensitive components (SI, Section 7.3).

Table 3
EHE Module: Location of Munitions Data Element Table

Directions: Below are eight classifications of munitions locations and their descriptions. Annotate the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface* , *subsurface* , *physical evidence* , and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Confirmed surface	Physical evidence indicates that there are UXO or DMM on the surface of the MRS. Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	25	
Confirmed subsurface, active	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20	
Confirmed subsurface, stable	Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS, and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15	
Suspected (physical evidence)	There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10	10
Suspected (historical evidence)	There is historical evidence indicating that UXO or DMM may be present at the MRS.	5	
Subsurface, physical constraint	There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2	
Small arms (regardless of location)	The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.]	1	
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).		**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space below.

Munitions debris was reported during the ASR and PA/SI at INPR Site No. 1 (2007 SI, Section 7.3). Large density of munitions debis is present in the Demolition Area (2007 SI, Section 7.3). There is a potential for munitions drift from the adjacent active Navy bombing range as evidenced by the presence of the BLU-73 fuel-air explosive bomb that was found in INPR Site No. 1 (PA/SI 2004).

Table 4
EHE Module: Ease of Access Data Element Table

Directions: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Annotate the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
No barrier	There is no barrier preventing access to any part of the MRS (i.e. all parts of the MRS are accessible).	10	
Barrier to MRS access is incomplete	There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8	8
Barrier to MRS access is complete but not monitored	There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5	
Barrier to MRS access is complete and monitored	There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0	
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).		**8**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space below.

The Demolition Area and portions of the INPR Site No. 1 have restricted access by the Boeing Company. The northern portion of the MRS is generally open to access (2007 SI, Section 7.3.2).

Table 5
EHE Module: Status of Property Data Element Table

Directions: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Annotate the score that corresponds with the status of property at the MRS.

Note: N/A

Classification	Description	Possible Score	Score
Non-DoD control	The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	5	5
Scheduled for transfer from DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3	
DoD control	The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0	
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space below.

The MRS is located on privately owned land (2007 SI, Section 2.3).

Table 6

EHE Module: Population Density Data Element Table

Directions: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and annotate the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Possible Score	Score
> 500 persons per square mile	There are more than 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	5	
100 - 500 persons per square mile	There are 100 to 500 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	3	
< 100 persons per square mile	There are fewer than 100 persons per square mile in the county in which the MRS is located, based on US Census Bureau data.	1	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**1**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space below.

The 2000 Census data indicate that the population density for Morrow County is 5.4 persons per square mile with a total county population of 10,995 (2007 SI, Section 2.4.3).

Table 7
EHE Module: Population Near Hazard Data Element Table

Directions: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and annotate the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
26 or more inhabited structures	There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5	5
16 to 25 inhabited structures	There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4	
11 to 15 inhabited structures	There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3	
6 to 10 inhabited structures	There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2	
1 to 5 inhabited structures	There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1	
0 inhabited structures	There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0	
POPULATION NEAR HAZARI	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space below.

The recent aerial photography data indicate that there are an estimated 79 inhabitated structures within 2 miles of the MRS (2007 SI Report, Section 3.2.3).

Table 8

EHE Module: Types of Activities/Structures Data Element Table

Directions: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and annotate the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structures* is defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Residential, educational, commercial, or subsistence	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5	5
Parks and recreational areas	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4	
Agricultural, forestry	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3	3
Industrial or warehousing	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2	
No known or recurring activities	There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1	
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space below.

There are residences located within 2 miles of the MRS. There are no schools or other critical assests located within a 2-mile radius (2007 SI Report, Section 2.4.3). Portions of the MRS and surrounding area are used for irrigated farming (2007 SI Report, Section 7.1).

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

Directions: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and annotate the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
Ecological and cultural resources present	There are both ecological and cultural resources present on the MRS.	5	
Ecological resources present	There are ecological resources present on the MRS.	3	3
Cultural resources present	There are cultural resources present on the MRS.	3	
No ecological or cultural resources present	There are no ecological resources or cultural resources present on the MRS.	0	
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).		**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space below.

There are no known archeological sites located within the MRS. The Oregon State Historic Preservation Office stated that two general areas were in the vicintiy of the MRS (AOCs) but no area was within the MRS (2007 SI, 3.2.1). Portions of the MRS are managed for ecological resources by The Nature Conservancy (2007 SI, Section 2.4.8, 6.1, Figure 2-6).

Table 10

Determining the EHE Module Rating

		Source	Score	Value
DIRECTIONS:	**Explosive Hazard Factor Data Elements**			
1. From Tables 01 - 09, record the data element scores in the **Score** boxes to the right.	Munitions Type	Table 01	30	40
	Source of Hazard	Table 02	10	
	Accessibility Factor Data Elements			
	Location of Munitions	Table 03	10	23
	Ease of Access	Table 04	8	
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.	Status of Property	Table 05	5	
	Receptor Factor Data Elements			
	Population Density	Table 06	1	14
	Population Near Hazard	Table 07	5	
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.	Types of Activities/Structures	Table 08	5	
	Ecological and/or Cultural Resources	Table 09	3	
	EHE MODULE TOTAL			**77**

	EHE Module Total	**EHE Module Rating**
4. Identify the appropriate range for the **EHE Module Total** at right.	92 to 100	A
	82 to 91	B
	71 to 81	C
	60 to 70	D
5. Identify the **EHE Module Rating** that corresponds to the range selected and record this rating in the **EHE Module Rating** box at the lower right corner of this table.	48 to 59	E
	38 to 47	F
	less than 38	G
NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Alternative Module Ratings	Evaluation Pending
		No Longer Required
		No Known or Suspected Explosive Hazard
	EHE MODULE RATING	**C**

Table 11

CHE Module: CWM Configuration Data Element Table

Directions: Below are seven classifications of CWM configuration and their descriptions. Annotate the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the MRSPP Primer (Draft, Dec 2005).

Classification	Description	Possible Score	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is (a) explosively configured CWM that are UXO (i.e. CWM/UXO), or (b) explosively configured CWM that are DMM (i.e. CWM/DMM) that have been damaged.	30	
CWM mixed with UXO	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25	
CWM, explosive configuration that are undamaged DMM	The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20	
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is (a) nonexplosively configured CWM/DMM, or (b) bulk CWM/DMM (e.g., ton container).	15	
CAIS K941 and CAIS K942	The CWM/DMM known or suspected of being present at the MRS is CAIS K941(toxic gas set M-1) or CAIS K942 (toxic gas set M-2/E11).	12	
CAIS (chemical agent identification sets)	Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10	
Evidence of no CWM	Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space below.

There have been no reported used of CWM at the MRA

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11 - 19, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	0
Ease of Access	Table 14	0	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	0	0
Population Near Hazard	Table 17	0	
Types of Activities/Structures	Table 18	0	
Ecological and/or Cultural Resources	Table 19	0	
CHE MODULE TOTAL			**0**

4. Identify the appropriate range for the **CHE Module Total** at right.

5. Identify the **CHE Module Rating** that corresponds to the range selected and record this rating in the **CHE Module Rating** box at the lower right corner of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Groundwater MC Hazard		**X**

Table 22

HHE Module: Surface Water - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Human Endpoint) MC Hazard	**X**

Table 23

HHE Module: Sediment - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	**H (High)**	**CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])**
100 > CHF >2	**M (Medium)**	
2 > CHF	**L (Low)**	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Human Endpoint) MC Hazard		**X**

Table 24

HHE Module: Surface Water - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use either dissolved or total metals analyses.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Ecological Endpoint) MC Hazard	**X**

Table 25

HHE Module: Sediment - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Sediment (Ecological Endpoint) MC Hazard	**X**

Table 26

HHE Module: Surface Soil - Data Element Table

Contaminant Hazard Factor (CHF)

Directions: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Note: N/A

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value
CHF > 100	H (High)
100 > CHF >2	M (Medium)
2 > CHF	L (Low)

CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

Directions: Annotate the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

Directions: Annotate the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Soil MC Hazard	**X**

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

Directions: **Only use this table if there are more than five contaminants present at the MRS.** This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B, Relative Risk Site Evaluation (RRSE) Primer, Summer 1997 - Revised) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: For human exposures to groundwater and surface water, use dissolved, rather than total, metals analyses when both are available. Remember not to add ratios from different media.

Media	Contaminant [CAS No.]	Maximum Concentration	Units	Comparison Value	Units	Ratios
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
				SUBTOTAL FOR SURFACE SOIL		**0**
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
				SUBTOTAL FOR SEDIMENT		**0**
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
				SUBTOTAL FOR SURFACE WATER		**0**
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
				SUBTOTAL FOR GROUNDWATER		**0**

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21 - 26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter-Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each medium's rating (A - G) and record the letter in the corresponding **Media Rating** box below.

Medium (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A - G)
Table 21 - Groundwater					
Table 22 - Surface Water (Human Endpoint)					
Table 23 - Sediment (Human Endpoint)					
Table 24 - Surface Water (Ecological Endpoint)					
Table 25 - Sediment (Ecological Endpoint)					
Table 26 - Surface Soil					
			HHE MODULE RATING		**No Known or Suspected MC Hazard**

DIRECTIONS (Continued):

4. Select the single highest **Media Rating** (A is the highest; G is the lowest) and enter the letter in the **HHE Module Rating** box below.

HHE Ratings (for reference only)	
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

NOTE: An alternative module rating may be assigned when a module letter rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Alternative Module Ratings	
	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, enter the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Enter the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

NOTE: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Reference Table 10:		Reference Table 20:		Reference Table 28:	
EHE Module Rating	Priority	CHE Module Rating	Priority	HHE Module Rating	Priority
C	4	No Known or Suspected CWM Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected MC Hazard

MRS or Alternative Priority	4

Appendix L
Reference Copies

The EDR Radius Map
with GeoCheck®

Boardman AFR
North
BOARDMAN, OR 97818

Inquiry Number: 1692341.2s

June 08, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NORTH
BOARDMAN, OR 97818

COORDINATES

Latitude (North):	45.757500 - 45° 45' 27.0''
Longitude (West):	119.782200 - 119° 46' 55.9''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	283624.3
UTM Y (Meters):	5070652.0
Elevation:	617 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	45119-G7 CROW BUTTE, OR
Most Recent Revision:	1993
South Map:	45119-F7 ELLA, OR
Most Recent Revision:	1993

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
BOARDMAN AIR FORCE RANGE N/A BOARDMAN, OR	CERCLIS	ORD987175627

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL Proposed National Priority List Sites
Delisted NPL National Priority List Deletions
NPL RECOVERY Federal Superfund Liens
CERC-NFRAP CERCLIS No Further Remedial Action Planned
CORRACTS Corrective Action Report
RCRA-TSDF Resource Conservation and Recovery Act Information
RCRA-LQG Resource Conservation and Recovery Act Information
ERNS Emergency Response Notification System
HMIRS Hazardous Materials Information Reporting System
US ENG CONTROLS Engineering Controls Sites List
US INST CONTROL Sites with Institutional Controls
US BROWNFIELDS A Listing of Brownfields Sites
CONSENT Superfund (CERCLA) Consent Decrees
ROD Records Of Decision
UMTRA Uranium Mill Tailings Sites
ODI Open Dump Inventory
TRIS Toxic Chemical Release Inventory System
TSCA Toxic Substances Control Act
FTTS FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS Section 7 Tracking Systems
ICIS Integrated Compliance Information System
PADS PCB Activity Database System
MLTS Material Licensing Tracking System
MINES Mines Master Index File
RAATS RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

SHWS - ECSI Environmental Cleanup Site Information System
OR CRL Confirmed Release List and Inventory
SWF/LF Solid Waste Facilities List
UIC Underground Injection Control Program Database
HIST LF Old Closed SW Disposal Sites
LUST Leaking Underground Storage Tank Database
AOC COL Columbia Slough
UST Underground Storage Tank Database
OR MANIFEST Manifest Information
OR SPILLS Spill Data
OR HAZMAT Hazmat/Incidents
ENG CONTROLS Engineering Controls Recorded at ESCI Sites
INST CONTROL Institutional Controls Recorded at ESCI Sites
VCS Voluntary Cleanup Program Sites
DRYCLEANERS Drycleaning Facilities
BROWNFIELDS Brownfields Projects
CDL Uninhabitable Drug Lab Properties

TRIBAL RECORDS

INDIAN RESERV Indian Reservations
INDIAN LUST Leaking Underground Storage Tanks on Indian Land
INDIAN UST Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Historical Auto Stations EDR Proprietary Historic Gas Stations
EDR Historical Cleaners EDR Proprietary Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database includes selective information on sites which generate, transport, store , treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/09/2006 has revealed that there is 1 RCRA-SQG site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FINLEY BUTTES REGIONAL LANDFIL	***73221 BOMBING RANGE RD***	***>2 SW***	***A3***	***12***

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 12/31/2004 has revealed that there is 1 DOD site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BOARDMAN NAVAL BOMBING RANGE		1 - 2 N	0	6

EXECUTIVE SUMMARY

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 12/05/2005 has revealed that there is 1 FUDS site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BOARDMAN AIR FORCE RANGE		>2 ENE	4	13

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 04/27/2006 has revealed that there is 1 FINDS site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FINLEY BUTTES REGIONAL LANDFIL	***73221 BOMBING RANGE RD***	***>2 SW***	***A3***	***12***

STATE AND LOCAL RECORDS

AST: The Aboveground Storage Tank database contains registered ASTs. The data comes from the list of ASTs reported to the Office of State Fire Marshal.

A review of the AST list, as provided by EDR, and dated 01/01/2006 has revealed that there is 1 AST site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FINLEY BUTTES LANDFILL CO	***73221 BOMBING RANGE RD***	***>2 SW***	***A2***	***6***

AIRS: A listing of Title V facility source and emissions information.

A review of the AIRS list, as provided by EDR, and dated 12/31/2002 has revealed that there is 1 AIRS site within approximately 3 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FINLEY BUTTES LANDFILL CO	***73221 BOMBING RANGE RD***	***>2 SW***	***A2***	***6***

EXECUTIVE SUMMARY

OR HSIS: Hazardous Substance Information Survey

A review of the HSIS list, as provided by EDR, and dated 01/01/2006 has revealed that there is 1 HSIS site within approximately 3 miles of the target property.

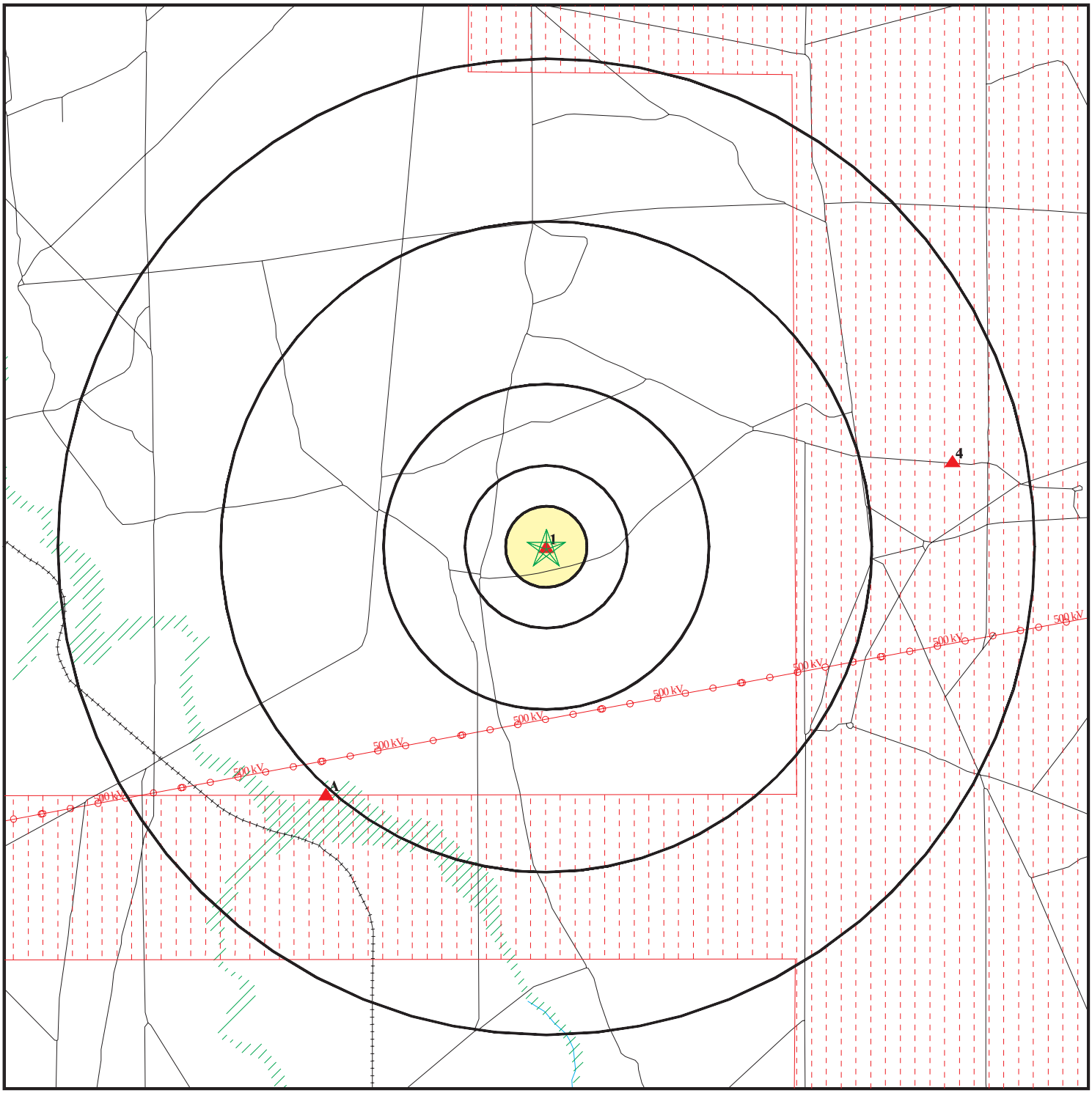
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FINLEY BUTTES LANDFILL CO	*73221 BOMBING RANGE RD*	*>2 SW*	*A2*	*6*

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
PORTLAND GENERAL ELECTRIC CO B	RCRA-SQG, FINDS, OR MANIFEST
BOARDMAN NAVAL BOMBING RANGE	SHWS - ECSI
BOARDMAN AIR FORCE RANGE	SHWS - ECSI
DESERT MAGIC DISPOSAL SITE	SHWS - ECSI
PGE - BOARDMAN	SHWS - ECSI, FINDS, AIRS
BOEING ENGINE TEST FACILITY	SHWS - ECSI, VCS
PGE COYOTE SPRINGS - TRANSFORMER RELEASE	SHWS - ECSI
BOARDMAN FOODS INC	AST, HSIS
BOARDMAN CITY OF	AST, HSIS
BOARDMAN CITY OF	AST, HSIS
BOARDMAN AUTO REPAIR	AST, HSIS
BOARDMAN CITY OF	AST, HSIS
BOARDMAN CITY OF	AST, HSIS
BOARDMAN CHIP CO INC	AST, HSIS
BOARDMAN CITY OF	AST, HSIS
BOEING BOARDMAN (OREGON)	AST, HSIS
PGE	AST, HSIS
PGE	OR SPILLS, AST, AIRS, HSIS
NORTH MORROW COUNTY TRANSFER STATION	SWF/LF
THREEMILE CANYON FARMS COMPOST FACILITY	SWF/LF
WASTE MANAGEMENT BARGE UNLOADING FACILIT	SWF/LF
FINLEY BUTTES REGIONAL LANDFILL	SWF/LF
BOARDMAN, CITY OF - SEWER SYSTEM	LUST, UST
BOARDMAN SCHOOL BUS SHED	LUST
BAKER, HAROLD C	UST
BOARDMAN, CITY OF - SEWER SYSTEM	UST
BOARDMAN, CITY OF -- WATER PLANT	UST
BOARDMAN PLANT	UST
H & B CONSTRUCTION	RCRA-SQG, FINDS
BOEING TEST SITE	RCRA-SQG, FINDS
BOARDMAN AIR FORCE RANGE	FINDS
BOARDMAN NAVAL BOMBING RANGE	FINDS
BOARDMAN, CITY OF - SEWER SYSTEM	FINDS
BOARDMAN, CITY OF	FINDS
BOARDMAN, CITY OF - SEWER SYSTEM	FINDS
BOARDMAN CITY OF SEWER SYSTEM	FINDS
BOARDMAN SCHOOL BUS SHED	FINDS
BOARDMAN AIRFORCE RANGE	FINDS
SAM BOARDMAN ELEM. SCHOOL	FINDS
BOARDMAN PLANT	TRIS
BOARDMAN COAL PLANT	OR SPILLS
BOARDMAN POWER PLANT	OR SPILLS

OVERVIEW MAP - 1692341.2s

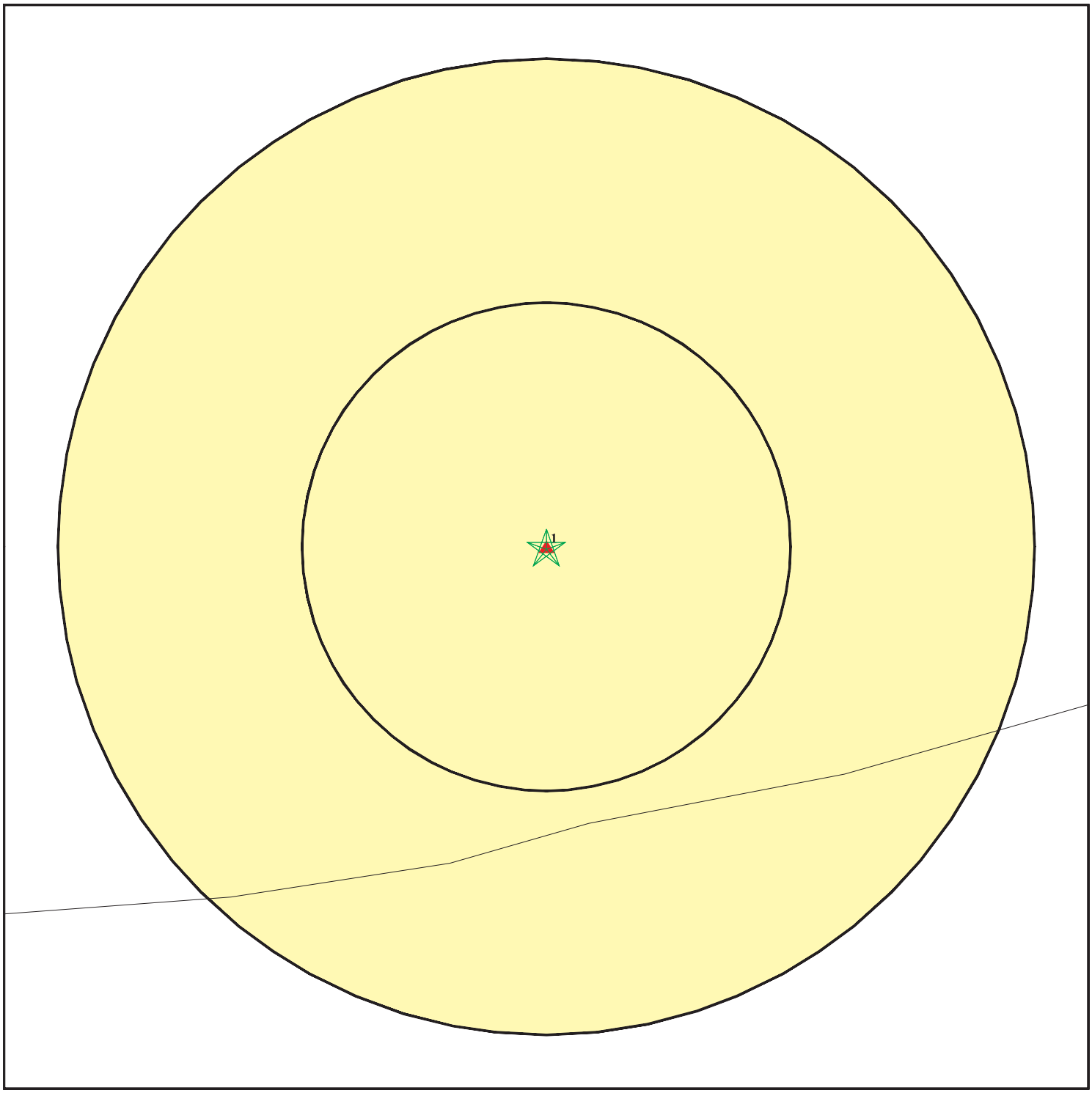


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Boardman AFR ADDRESS: North BOARDMAN OR 97818 LAT/LONG: 45.7575 / 119.7822	CLIENT: Shaw Env. and Infrastructure CONTACT: Jennifer Lillis INQUIRY #: 1692341.2s DATE: June 08, 2006

DETAIL MAP - 1692341.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Boardman AFR ADDRESS: North BOARDMAN OR 97818 LAT/LONG: 45.7575 / 119.7822	CLIENT: Shaw Env. and Infrastructure CONTACT: Jennifer Lillis INQUIRY #: 1692341.2s DATE: June 08, 2006

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		3.000	0	0	0	0	0	0
Proposed NPL		3.000	0	0	0	0	0	0
Delisted NPL		3.000	0	0	0	0	0	0
NPL RECOVERY		3.000	0	0	0	0	0	0
CERCLIS	X	3.000	0	0	0	0	0	0
CERC-NFRAP		3.000	0	0	0	0	0	0
CORRACTS		3.000	0	0	0	0	0	0
RCRA TSD		3.000	0	0	0	0	0	0
RCRA Lg. Quan. Gen.		3.000	0	0	0	0	0	0
RCRA Sm. Quan. Gen.		3.000	0	0	0	0	1	1
ERNS		3.000	0	0	0	0	0	0
HMIRS		3.000	0	0	0	0	0	0
US ENG CONTROLS		3.000	0	0	0	0	0	0
US INST CONTROL		3.000	0	0	0	0	0	0
DOD		3.000	0	0	0	0	1	1
FUDS		3.000	0	0	0	0	1	1
US BROWNFIELDS		3.000	0	0	0	0	0	0
CONSENT		3.000	0	0	0	0	0	0
ROD		3.000	0	0	0	0	0	0
UMTRA		3.000	0	0	0	0	0	0
ODI		3.000	0	0	0	0	0	0
TRIS		3.000	0	0	0	0	0	0
TSCA		3.000	0	0	0	0	0	0
FTTS		3.000	0	0	0	0	0	0
SSTS		3.000	0	0	0	0	0	0
ICIS		3.000	0	0	0	0	0	0
PADS		3.000	0	0	0	0	0	0
MLTS		3.000	0	0	0	0	0	0
MINES		3.000	0	0	0	0	0	0
FINDS		3.000	0	0	0	0	1	1
RAATS		3.000	0	0	0	0	0	0
STATE AND LOCAL RECORDS								
State Haz. Waste - ECSI		3.000	0	0	0	0	0	0
OR CRL		3.000	0	0	0	0	0	0
State Landfill		3.000	0	0	0	0	0	0
UIC		3.000	0	0	0	0	0	0
HIST LF		3.000	0	0	0	0	0	0
LUST		3.000	0	0	0	0	0	0
AOC COL		3.000	0	0	0	0	0	0
UST		3.000	0	0	0	0	0	0
AST		3.000	0	0	0	0	1	1
MANIFEST		3.000	0	0	0	0	0	0
OR SPILLS		3.000	0	0	0	0	0	0
OR HAZMAT		3.000	0	0	0	0	0	0
ENG CONTROLS		3.000	0	0	0	0	0	0
INST CONTROL		3.000	0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
VCS		3.000	0	0	0	0	0	0
DRYCLEANERS		3.000	0	0	0	0	0	0
BROWNFIELDS		3.000	0	0	0	0	0	0
CDL		3.000	0	0	0	0	0	0
AIRS		3.000	0	0	0	0	1	1
HSIS		3.000	0	0	0	0	1	1
TRIBAL RECORDS								
INDIAN RESERV		3.000	0	0	0	0	0	0
INDIAN LUST		3.000	0	0	0	0	0	0
INDIAN UST		3.000	0	0	0	0	0	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		3.000	0	0	0	0	0	0
EDR Historical Auto Stations		3.000	0	0	0	0	0	0
EDR Historical Cleaners		3.000	0	0	0	0	0	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
Target
Property

Actual:
617 ft.

BOARDMAN AIR FORCE RANGE — **CERCLIS** — **1002999527**
N/A — **ORD987175627**
BOARDMAN, OR

CERCLIS Classification Data:
Federal Facility: Not a Federal Facility
Non NPL Status: Combined PA/SI Ongoing
NPL Status: Not on the NPL

CERCLIS Assessment History:

Assessment:	DISCOVERY	Completed:	03/20/1990
Assessment:	PRELIMINARY ASSESSMENT	Completed:	06/16/1992
Assessment:	ARCHIVE SITE	Completed:	07/26/1994
Assessment:	SITE INSPECTION	Completed:	07/26/1994
Assessment:	SITE UNARCHIVED	Completed:	08/28/2003

CERCLIS Site Status:
Not reported
CERCLIS Alias Name(s):
BOARDMAN AIRFORCE RANGE

DOD
Region
North
> 1
8045 ft.

BOARDMAN NAVAL BOMBING RANGE — **DOD** — **CUSA003112**
N/A
BOARDMAN NAVAL BOMBING RA (County), OR
Additional polygons located at: North 15387 ft.

FEDERAL LANDS:

Feature 1:	Navy DOD
Feature 2:	Not reported
Feature 3:	Not reported
Agency:	DOD
URL:	Not reported
Name 1:	Boardman Naval Bombing Range
Name 2:	Not reported
Name 3:	Not reported
State:	OR

A2
SW
> 1
10739 ft.

Relative:
Equal

Actual:
617 ft.

FINLEY BUTTES LANDFILL CO — **AST** — **S104049988**
73221 BOMBING RANGE RD — **AIRS** — **N/A**
BOARDMAN, OR 97818 — **HSIS**

Site 1 of 2 in cluster A

HSIS:

Emergency Contact:	JAMES BROWNING
Emergency Procedure:	OFFICE
Chemical Trade Name:	ACETYLENE
Manager Name:	JAMES BROWNING
Mailing Address:	PO BOX 61726 VANCOUVER, WA 98666
Mailing County:	CLARK
Day Phone:	5414812233
Employee File #:	023682
No. of Employees:	11
Placard:	No
Business Type:	MUNICIPAL SOLID WASTE LANDFILL & MANAGEMENT GROUP
Sprinkler System:	No
Business Phone:	5414812233
Department Or Division Of Company:	Not reported
Facility Has Written Emergency Plan:	Yes
Company Name:	FINLEY BUTTES LANDFILL CO

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

Fire Dept Code:	0000
Physical State :	Not reported
Physical State Of The Substance:	GAS
Average Amount Possessed During The Year Code:	10
Description Of The Avg Qnty Code:	200-499
Maximum Amount Possessed During The Year Code:	10
Description Of The Max Qnty Code:	200-499
Applicable Unit Of Measure Code:	3
Description Of The Unit Of Measure:	CUBIC FEET
Storage Container:	
Type Code:	L
Description:	CYLINDER
Pressure of Hazardous Substance Code:	1
Pressure Description:	NORMAL PRESSURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Days The Hazardous Substance Is On Site During Year:	365
Is The Substance Protected A Trade Secret:	No
United Nations/north America 4 Digit Classification Number:	1001
Chemical Abstract Service Identifier Number:	74862
First Hazardous Classification Code For Chemical:	2.1
Hazard Classification 1 Of The Chemical:	Flammable Gases
Second Hazardous Classification Code For Chemical:	6.3
Hazard Classification 2 Of The Chemical:	Acute Health Hazard
Third Hazardous Classification Code For Chemical:	Not reported
Hazard Classification 3 Of The Chemical:	Not reported
Is Substance Pure Or Mixture:	Pure
Hazard Rank:	2
Chemical Is An Extremely Hazardous Substance (ehs):	Not reported
Does The Chemical Contain A 112r Chemical:	No
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Most Hazardous Ingridient:	ACETYLENE
Contains 112R :	No
Contains EHS:	No
Contains 313:	No
Fertilizer:	No
Pesticide:	No
NAICS Code 1:	562212
NAICS Desc 1:	SOLID WASTE LANDFILL
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
Emergency Contact:	JAMES BROWNING
Emergency Procedure: OFFICE	
Chemical Trade Name:	OXYGEN
Manager Name:	JAMES BROWNING
Mailing Address:	PO BOX 61726 VANCOUVER, WA 98666
Mailing County:	CLARK
Day Phone:	5414812233
Employee File #:	023682
No. of Employees:	11
Placard:	No
Business Type:	MUNICIPAL SOLID WASTE LANDFILL & MANAGEMENT GROUP
Sprinkler System:	No
Business Phone:	5414812233

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

Department Or Division Of Company:	Not reported
Facility Has Written Emergency Plan:	Yes
Company Name:	FINLEY BUTTES LANDFILL CO
Fire Dept Code:	0000
Physical State :	Not reported
Physical State Of The Substance:	GAS
Average Amount Possessed During The Year Code:	10
Description Of The Avg Qnty Code:	200-499
Maximum Amount Possessed During The Year Code:	10
Description Of The Max Qnty Code:	200-499
Applicable Unit Of Measure Code:	3
Description Of The Unit Of Measure:	CUBIC FEET
Storage Container:	
Type Code:	L
Description:	CYLINDER
Pressure of Hazardous Substance Code:	1
Pressure Description:	NORMAL PRESSURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Days The Hazardous Substance Is On Site During Year:	365
Is The Substance Protected A Trade Secret:	No
United Nations/north America 4 Digit Classification Number:	1072
Chemical Abstract Service Identifier Number:	7782447
First Hazardous Classification Code For Chemical:	2.2
Hazard Classification 1 Of The Chemical:	NonFlammable Gases
Second Hazardous Classification Code For Chemical:	5.1
Hazard Classification 2 Of The Chemical:	Oxidizers
Third Hazardous Classification Code For Chemical:	Not reported
Hazard Classification 3 Of The Chemical:	Not reported
Is Substance Pure Or Mixture:	Pure
Hazard Rank:	2
Chemical Is An Extremely Hazardous Substance (ehs):	Not reported
Does The Chemical Contain A 112r Chemical:	No
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Most Hazardous Ingridient:	OXYGEN
Contains 112R :	No
Contains EHS:	No
Contains 313:	No
Fertilizer:	No
Pesticide:	No
NAICS Code 1:	562212
NAICS Desc 1:	SOLID WASTE LANDFILL
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
Emergency Contact:	JAMES BROWNING
Emergency Procedure: OFFICE	
Chemical Trade Name:	ANTIFREEZE
Manager Name:	JAMES BROWNING
Mailing Address:	PO BOX 61726 VANCOUVER, WA 98666
Mailing County:	CLARK
Day Phone:	5414812233
Employee File #:	023682
No. of Employees:	11
Placard:	No

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

Business Type:	MUNICIPAL SOLID WASTE LANDFILL & MANAGEMENT GROUP
Sprinkler System:	No
Business Phone:	5414812233
Department Or Division Of Company:	Not reported
Facility Has Written Emergency Plan:	Yes
Company Name:	FINLEY BUTTES LANDFILL CO
Fire Dept Code:	0000
Physical State :	Not reported
Physical State Of The Substance:	LIQUID
Average Amount Possessed During The Year Code:	04
Description Of The Avg Qnty Code:	50-199
Maximum Amount Possessed During The Year Code:	10
Description Of The Max Qnty Code:	200-499
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Storage Container:	
Type Code:	D
Description:	STEEL DRUM
Pressure of Hazardous Substance Code:	1
Pressure Description:	NORMAL PRESSURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Days The Hazardous Substance Is On Site During Year:	365
Is The Substance Protected A Trade Secret:	No
United Nations/north America 4 Digit Classification Number:	3082
Chemical Abstract Service Identifier Number:	107211
First Hazardous Classification Code For Chemical:	6.3
Hazard Classification 1 Of The Chemical:	Acute Health Hazard
Second Hazardous Classification Code For Chemical:	Not reported
Hazard Classification 2 Of The Chemical:	Not reported
Third Hazardous Classification Code For Chemical:	Not reported
Hazard Classification 3 Of The Chemical:	Not reported
Is Substance Pure Or Mixture:	Mixture
Hazard Rank:	2
Chemical Is An Extremely Hazardous Substance (ehs):	Not reported
Does The Chemical Contain A 112r Chemical:	No
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Most Hazardous Ingridient:	ETHYLENE GLYCOL
Contains 112R :	No
Contains EHS:	No
Contains 313:	Yes
Fertilizer:	No
Pesticide:	No
NAICS Code 1:	562212
NAICS Desc 1:	SOLID WASTE LANDFILL
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
Emergency Contact:	JAMES BROWNING
Emergency Procedure: OFFICE	
Chemical Trade Name:	GASOLINE UNLEADED
Manager Name:	JAMES BROWNING
Mailing Address:	PO BOX 61726 VANCOUVER, WA 98666
Mailing County:	CLARK
Day Phone:	5414812233

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

Employee File #:	023682
No. of Employees:	11
Placard:	No
Business Type:	MUNICIPAL SOLID WASTE LANDFILL & MANAGEMENT GROUP
Sprinkler System:	No
Business Phone:	5414812233
Department Or Division Of Company:	Not reported
Facility Has Written Emergency Plan:	Yes
Company Name:	FINLEY BUTTES LANDFILL CO
Fire Dept Code:	0000
Physical State :	Not reported
Physical State Of The Substance:	LIQUID
Average Amount Possessed During The Year Code:	04
Description Of The Avg Qnty Code:	50-199
Maximum Amount Possessed During The Year Code:	10
Description Of The Max Qnty Code:	200-499
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Storage Container:	
Type Code:	A
Description:	ABOVEGROUND TANK
Pressure of Hazardous Substance Code:	1
Pressure Description:	NORMAL PRESSURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Days The Hazardous Substance Is On Site During Year:	365
Is The Substance Protected A Trade Secret:	No
United Nations/north America 4 Digit Classification Number:	1203
Chemical Abstract Service Identifier Number:	8006619
First Hazardous Classification Code For Chemical:	3.1
Hazard Classification 1 Of The Chemical:	Flammable Liq.(FP<0F)
Second Hazardous Classification Code For Chemical:	6.4
Hazard Classification 2 Of The Chemical:	Chronic Health Hazard
Third Hazardous Classification Code For Chemical:	6.3
Hazard Classification 3 Of The Chemical:	Acute Health Hazard
Is Substance Pure Or Mixture:	Mixture
Hazard Rank:	2
Chemical Is An Extremely Hazardous Substance (ehs):	Not reported
Does The Chemical Contain A 112r Chemical:	No
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Most Hazardous Ingridient:	PETROLEUM DISTILLATES
Contains 112R :	No
Contains EHS:	No
Contains 313:	Yes
Fertilizer:	No
Pesticide:	No
NAICS Code 1:	562212
NAICS Desc 1:	SOLID WASTE LANDFILL
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
Emergency Contact:	JAMES BROWNING
Emergency Procedure: OFFICE	
Chemical Trade Name:	USED MOTOR OIL
Manager Name:	JAMES BROWNING
Mailing Address:	PO BOX 61726

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

	VANCOUVER, WA 98666
Mailing County:	CLARK
Day Phone:	5414812233
Employee File #:	023682
No. of Employees:	11
Placard:	No
Business Type:	MUNICIPAL SOLID WASTE LANDFILL & MANAGEMENT GROUP
Sprinkler System:	No
Business Phone:	5414812233
Department Or Division Of Company:	Not reported
Facility Has Written Emergency Plan:	Yes
Company Name:	FINLEY BUTTES LANDFILL CO
Fire Dept Code:	0000
Physical State :	Not reported
Physical State Of The Substance:	LIQUID
Average Amount Possessed During The Year Code:	10
Description Of The Avg Qnty Code:	200-499
Maximum Amount Possessed During The Year Code:	11
Description Of The Max Qnty Code:	500-999
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Storage Container:	
Type Code:	C
Description:	TANK INSIDE BUILDING
Pressure of Hazardous Substance Code:	1
Pressure Description:	NORMAL PRESSURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Days The Hazardous Substance Is On Site During Year:	365
Is The Substance Protected A Trade Secret:	No
United Nations/north America 4 Digit Classification Number:	1270
Chemical Abstract Service Identifier Number:	64742547
First Hazardous Classification Code For Chemical:	4.5
Hazard Classification 1 Of The Chemical:	Combustible Materials
Second Hazardous Classification Code For Chemical:	6.4
Hazard Classification 2 Of The Chemical:	Chronic Health Hazard
Third Hazardous Classification Code For Chemical:	Not reported
Hazard Classification 3 Of The Chemical:	Not reported
Is Substance Pure Or Mixture:	Mixture
Hazard Rank:	2
Chemical Is An Extremely Hazardous Substance (ehs):	Not reported
Does The Chemical Contain A 112r Chemical:	No
Chemical Is A Toxic 313 Chemical:	Not reported
EPA Pesticide Registration Number:	Not reported
Most Hazardous Ingridient:	PETROLEUM HYDROCARBONS
Contains 112R :	Not reported
Contains EHS:	Not reported
Contains 313:	Not reported
Fertilizer:	Not reported
Pesticide:	Not reported
NAICS Code 1:	562212
NAICS Desc 1:	SOLID WASTE LANDFILL
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported

Click this hyperlink while viewing on your computer to access
2 additional OR HSIS record(s) in the EDR Site Report.

FINLEY BUTTES LANDFILL CO (Continued) **S104049988**

OR AIRS:
Source ID: 250001
SIC Code: 4953
Lat Dec: 46
Lat Deg: 45
Lat Min: 44
Lat Sec: 41
Lon Dec: -120
Lon Deg: -119
Lon Min: 37
Lon Sec: 23
Permit Type: TV
Report Year: 2002
Pollutant: CO
Sum Of Emmission Amount: 1.12
Report Year: 2002
Pollutant: NO2
Sum Of Emmission Amount: 5.18
Report Year: 2002
Pollutant: PM10
Sum Of Emmission Amount: 43.26
Report Year: 2002
Pollutant: PT
Sum Of Emmission Amount: 43.26
Report Year: 2002
Pollutant: VOC
Sum Of Emmission Amount: 16.80

AST:
Employer File Number: 023682
Hazardous Substance: DIESEL FUEL #2
Reporting Quantities: 5,000-9,999
Quantity Units: GALLONS
Physical State: LIQUID
Storage 1: ABOVEGROUND TANK

Employer File Number: 023682
Hazardous Substance: GASOLINE UNLEADED
Reporting Quantities: 200-499
Quantity Units: GALLONS
Physical State: LIQUID
Storage 1: ABOVEGROUND TANK

A3 **FINLEY BUTTES REGIONAL LANDFIL** **RCRA-SQG** **1004770915**
SW **73221 BOMBING RANGE RD** **FINDS** **ORD987199643**
> 1 **BOARDMAN, OR 97818**
10739 ft.

Site 2 of 2 in cluster A

Relative:
Equal

Actual:
617 ft.

FINLEY BUTTES REGIONAL LANDFIL (Continued) **1004770915**

RCRAInfo:
Owner: WASTE CONNECTIONS INC
(503) 288-7844
EPA ID: ORD987199643
Contact: NO DATA ENTERED NO DATA ENTERED
NO DATA ENTERED
Classification: Conditionally Exempt Small Quantity Generator
TSDF Activities: Not reported
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.
The NEI (National Emissions Inventory) database contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs).
OR-DEQ (Oregon - Department Of Environmental Quality) is a regulatory agency whose job is to protect the quality of Oregon's Environment. DEQ uses a combination of technical assistance, inspections and permitting to help public and private facilities and citizens understand and comply with state and federal environmental regulations.
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

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4 **BOARDMAN AIR FORCE RANGE** **FUDS** **1007211232**
ENE **N/A**
> 1 **BOARDMAN, OR**
13470 ft.

Relative:
Equal

Actual:
617 ft.

FUDS:
Federal Facility ID: OR9799F3076
Facility Name: BOARDMAN AIR FORCE RANGE
City: BOARDMAN
State: OR
EPA Region: 0
County: MORROW
Congressional District: 02
US Army District: Seattle District (NWS)
Fiscal Year: 2004
Phone: 206-764-6958
Inst ID: Not reported
CTC: Not reported
RAB: Not reported
FUDS History : The land was acquired between 1941 and 1943 for use by the Army Air Corps as an aerial bombing and gunnery range. The site was declared excess in 1960, and approximately 58,400 acres were transferred to the Navy. Between 1960 and the present, the Ai
r Force and the Navy have excessed approximately 58,700 acres. Most of the land was conveyed to the State of Oregon, which leases the lands

BOARDMAN AIR FORCE RANGE (Continued) **1007211232**

to Boeing AGRI-Industrial Company.

FUDS Description : The 96,000-acre site is located in Morrow County, approximately 5 miles west of the City of Boardman, Oregon. It was acquired to serve as an aerial bombing and gunner range. Approximately 20 buildings were constructed. Two potential ordnance sites h
ave been located on land now belonging to the State of Oregon. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance) and therefore may present an explosive hazard.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BOARDMAN	1000103607	H & B CONSTRUCTION	RT 1 BOX 48C PAUL SMITH RD	97818	RCRA-SQG, FINDS
BOARDMAN	U000438422	BAKER, HAROLD C	ROUTE 1, BOX 49-F, KUNZE RD	97818	UST
BOARDMAN	S106780143	BOARDMAN NAVAL BOMBING RANGE	2/3N/4N/25E	97818	SHWS - ECSI
BOARDMAN	S105613818	BOARDMAN AIR FORCE RANGE	3N / 4N/24E	97818	SHWS - ECSI
BOARDMAN	1006867360	BOARDMAN AIR FORCE RANGE	3N& 4N/24E	97818	FINDS
BOARDMAN	S106780177	DESERT MAGIC DISPOSAL SITE	4N/25E/S7	97818	SHWS - ECSI
BOARDMAN	1007260958	BOARDMAN NAVAL BOMBING RANGE	BOARDMAN NAVAL BOMBING RANGE	97818	FINDS
BOARDMAN	S105614056	BOARDMAN COAL PLANT	CARTY RESERVOIR	97818	OR SPILLS
BOARDMAN	1006854024	PGE - BOARDMAN	CARTY RESERVOIR POWER SITE	97818	SHWS - ECSI, FINDS, AIRS
BOARDMAN	U004016439	BOARDMAN, CITY OF - SEWER SYSTEM	COLUMBIA AVE AT N MAIN ST	97818	UST
BOARDMAN	S104790824	BOARDMAN FOODS INC	71320 COLUMBIA LN	97818	AST, HSIS
BOARDMAN	S103705231	BOARDMAN CITY OF	NW COLUMBIA NMAIN ST	97818	AST, HSIS
BOARDMAN	S103705228	BOARDMAN CITY OF	E COLUMBIA RIPPE RD	97818	AST, HSIS
BOARDMAN	1006845236	BOARDMAN, CITY OF - SEWER SYSTEM	COLUMBIA AVE AT RIPPEE RD	97818	FINDS
BOARDMAN	1006855212	BOARDMAN, CITY OF	3 MI E OF CITY	97818	FINDS
BOARDMAN	U000438430	BOARDMAN, CITY OF - SEWER SYSTEM	SW FRONT ST - WILDLIFE AREA	97818	LUST, UST
BOARDMAN	S104043220	BOARDMAN AUTO REPAIR	101 SE FRONT	97818	AST, HSIS
BOARDMAN	1006845230	BOARDMAN, CITY OF - SEWER SYSTEM	SW FRONT ST - WILDLIFE AREA	97818	FINDS
BOARDMAN	S103415483	BOARDMAN CITY OF	SW FRONTAGE RD	97818	AST, HSIS
BOARDMAN	S107134738	NORTH MORROW COUNTY TRANSFER STATION	69900 FRONTAGE LANE	97818	SWF/LF
BOARDMAN	1006845233	BOARDMAN CITY OF SEWER SYSTEM	202 MAIN STREET	97818	FINDS
BOARDMAN	U004016440	BOARDMAN, CITY OF -- WATER PLANT	MARINE DR	97818	UST
BOARDMAN	S105744798	BOARDMAN CITY OF	1A E MARINE DR	97818	AST, HSIS
BOARDMAN	S104326169	BOARDMAN CHIP CO INC	70850 E MARINE LN	97818	AST, HSIS
BOARDMAN	S105857564	BOARDMAN CITY OF	79579 N RIPPEE RD	97818	AST, HSIS
BOARDMAN	S107600274	THREEMILE CANYON FARMS COMPOST FACILITY	75906 THREEMILE ROAD	97818	SWF/LF
BOARDMAN	U004016438	BOARDMAN PLANT	TOWER RD	97818	UST
BOARDMAN	S107593155	BOARDMAN POWER PLANT	73334 TOWER ROAD	97818	OR SPILLS
BOARDMAN	S106899836	BOEING BOARDMAN (OREGON)	78433 TOWER RD	97818	AST, HSIS
BOARDMAN	1005454998	BOARDMAN PLANT	73334 TOWER RD.	97818	TRIS
BOARDMAN	1000354776	PORTLAND GENERAL ELECTRIC CO B	73334 TOWER RD	97818	RCRA-SQG, FINDS, OR MANIFEST
BOARDMAN	1004770294	BOEING TEST SITE	78433 TOWER RD	97818	RCRA-SQG, FINDS
BOARDMAN	S105744640	PGE	73334 TOWER RD	97818	AST, HSIS
BOARDMAN	S106497172	BOEING ENGINE TEST FACILITY	TOWER RD (5 MILES SOUTH OF BOARDMA	97818	SHWS - ECSI, VCS
BOARDMAN	S105745456	PGE	200 ULLMAN BLVD	97818	OR SPILLS, AST, AIRS, HSIS
BOARDMAN	S107421115	PGE COYOTE SPRINGS - TRANSFORMER RELEASE	200 ULLMAN RD	97818	SHWS - ECSI
BOARDMAN	S107505191	WASTE MANAGEMENT BARGE UNLOADING FACILIT	79827 ULLMAN DRIVE	97818	SWF/LF
BOARDMAN	S100500496	BOARDMAN SCHOOL BUS SHED	UNKNOWN	97818	LUST
BOARDMAN	1006864372	BOARDMAN SCHOOL BUS SHED	UNKNOWN	97818	FINDS
BOARDMAN	1007152959	BOARDMAN AIRFORCE RANGE	5 MI W OF CY OF BOARDMAN T2N R24E 1-24;	97818	FINDS
BOARDMAN	1008329469	SAM BOARDMAN ELEM. SCHOOL	WILSON RD	97818	FINDS
MORROW COUNTY	S106918883	FINLEY BUTTES REGIONAL LANDFILL	10 MI. S OF BOARDMAN SEC05,T2N,R26E		SWF/LF

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/21/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 40

Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/14/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56
Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56
Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177
Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 01/19/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 33
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/26/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/2004
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 04/25/2005
Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/13/2006
Date Data Arrived at EDR: 04/28/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 32

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 11/04/2005
Date Data Arrived at EDR: 11/28/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 63

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 07/13/2005
Date Made Active in Reports: 08/17/2005
Number of Days to Update: 35

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 04/12/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/29/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 03/31/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 05/11/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 11

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/13/2006
Date Data Arrived at EDR: 04/21/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 02/08/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 19

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 06/02/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/12/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 62

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/29/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/27/2006
Date Data Arrived at EDR: 05/02/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 28

Source: EPA
Telephone: N/A
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/05/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 06/17/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 48

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Biennially

STATE AND LOCAL RECORDS

SHWS - ECSI: Environmental Cleanup Site Information System
Sites that are or may be contaminated and may require cleanup.

Date of Government Version: 05/01/2006
Date Data Arrived at EDR: 05/16/2006
Date Made Active in Reports: 06/01/2006
Number of Days to Update: 16

Source: Department of Environmental Quality
Telephone: 503-229-6629
Last EDR Contact: 05/16/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Quarterly

CRL: Confirmed Release List and Inventory
All facilities with a confirmed release.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 28

Source: Department of Environmental Quality
Telephone: 503-229-6170
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

SWF/LF: Solid Waste Facilities List
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 04/11/2006
Date Data Arrived at EDR: 04/12/2006
Date Made Active in Reports: 04/21/2006
Number of Days to Update: 9

Source: Department of Environmental Quality
Telephone: 503-229-6299
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Semi-Annually

UIC: Underground Injection Control Program Database
DEQ's Underground Injection Control Program is authorized by the Environmental Protection Agency (EPA) to regulate all underground injection in Oregon to protect groundwater resources.

Date of Government Version: 04/27/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 06/01/2006
Number of Days to Update: 35

Source: Department of Environmental Quality
Telephone: 503-229-5945
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

HIST LF: Old Closed SW Disposal Sites
A list of solid waste disposal sites that have been closed for a long while.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 07/08/2003
Date Made Active in Reports: 07/18/2003
Number of Days to Update: 10

Source: Department of Environmental Quality
Telephone: 503-229-5409
Last EDR Contact: 07/08/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LUST: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 01/12/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 28

Source: Department of Environmental Quality
Telephone: 503-229-5790
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

AOC COL: Columbia Slough
Columbia Slough waterway boundaries.

Date of Government Version: N/A
Date Data Arrived at EDR: 10/03/2002
Date Made Active in Reports: 10/22/2002
Number of Days to Update: 19

Source: City of Portland Environmental Services
Telephone: 503-823-5310
Last EDR Contact: 08/05/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

AOC MU: East Multnomah County Area
Approximate extent of TSA VOC plume February , 2002

Date of Government Version: N/A
Date Data Arrived at EDR: 10/07/2002
Date Made Active in Reports: 10/22/2002
Number of Days to Update: 15

Source: City of Portland Environmental Services
Telephone: 503-823-5310
Last EDR Contact: 08/26/2002
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/03/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/03/2006
Number of Days to Update: 19

Source: Department of Environmental Quality
Telephone: 503-229-5815
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

AST: Aboveground Storage Tanks
Aboveground storage tank locations reported to the Office of State Fire Marshal.

Date of Government Version: 01/01/2006
Date Data Arrived at EDR: 03/16/2006
Date Made Active in Reports: 04/03/2006
Number of Days to Update: 18

Source: Office of State Fire Marshal
Telephone: 503-378-3473
Last EDR Contact: 05/30/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Semi-Annually

MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/21/2006
Number of Days to Update: 35

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Annually

SPILLS: Spill Data

Date of Government Version: 03/22/2006
Date Data Arrived at EDR: 03/23/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 20

Source: Department of Environmental Quality
Telephone: 503-229-5815
Last EDR Contact: 03/23/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Semi-Annually

HAZMAT: Hazmat/Incidents

Hazardous material incidents reported to the State Fire Marshal by emergency responders. The hazardous material may or may not have been released.

Date of Government Version: 08/31/2004
Date Data Arrived at EDR: 10/12/2004
Date Made Active in Reports: 11/05/2004
Number of Days to Update: 24

Source: State Fire Marshal's Office
Telephone: 503-373-1540
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Semi-Annually

ENG CONTROLS: Engineering Controls Recorded at ESCI Sites

Engineering controls are physical measures selected or approved by the Director for the purpose of preventing or minimizing exposure to hazardous substances. Engineering controls may include, but are not limited to, fencing, capping, horizontal or vertical barriers, hydraulic controls, and alternative water supplies.

Date of Government Version: 05/01/2006
Date Data Arrived at EDR: 05/16/2006
Date Made Active in Reports: 06/01/2006
Number of Days to Update: 16

Source: Department of Environmental Quality
Telephone: 503-229-5193
Last EDR Contact: 05/16/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Quarterly

INST CONTROL: Institutional Controls Recorded at ESCI Sites

An institutional control is a legal or administrative tool or action taken to reduce the potential for exposure to hazardous substances. Institutional controls may include, but are not limited to, use restrictions, environmental monitoring requirements, and site access and security measures.

Date of Government Version: 05/01/2006
Date Data Arrived at EDR: 05/16/2006
Date Made Active in Reports: 06/01/2006
Number of Days to Update: 16

Source: Department of Environmental Quality
Telephone: 503-229-5193
Last EDR Contact: 05/15/2006
Next Scheduled EDR Contact: 08/14/2006
Data Release Frequency: Quarterly

VCS: Voluntary Cleanup Program Sites

Responsible parties have entered into an agreement with DEQ to voluntarily address contamination associated with their property.

Date of Government Version: 02/14/2006
Date Data Arrived at EDR: 02/15/2006
Date Made Active in Reports: 03/15/2006
Number of Days to Update: 28

Source: DEQ
Telephone: 503-229-5256
Last EDR Contact: 06/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

DRYCLEANERS: Drycleaning Facilities

A listing of registered drycleaning facilities in Oregon.

Date of Government Version: 12/01/2005
Date Data Arrived at EDR: 12/13/2005
Date Made Active in Reports: 01/05/2006
Number of Days to Update: 23

Source: Department of Environmental Quality
Telephone: 503-229-6783
Last EDR Contact: 05/30/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Varies

BROWNFIELDS: Brownfields Projects

Brownfields investigations and/or cleanups that have been conducted in Oregon.

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 28

Source: Department of Environmental Quality
Telephone: 503-229-6801
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Semi-Annually

CDL: Uninhabitable Drug Lab Properties

The properties listed on these county pages have been declared by a law enforcement agency to be unfit for use due to meth lab and/or storage activities. The properties are considered uninhabitable until cleaned up by a state certified decontamination contractor and a certificate of fitness is issued by the Oregon Health Division.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 14

Source: Department of Consumer & Business Services
Telephone: 503-378-4133
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Varies

AIRS: Oregon Title V Facility Listing

A listing of Title V facility source and emissions information.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 05/04/2006
Date Made Active in Reports: 06/01/2006
Number of Days to Update: 28

Source: Department of Environmental Quality
Telephone: 503-229-6459
Last EDR Contact: 05/03/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

HSIS: Hazardous Substance Information Survey

Companies in Oregon submitting the Hazardous Substance Information Survey and either reporting or not reporting hazardous substances.

Date of Government Version: 01/01/2006
Date Data Arrived at EDR: 03/16/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 27

Source: State Fire Marshal's Office
Telephone: 503-373-1540
Last EDR Contact: 05/30/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Semi-Annually

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 03/14/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 22

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

INDIAN UST: Underground Storage Tanks on Indian Land

Date of Government Version: 04/05/2006
Date Data Arrived at EDR: 04/05/2006
Date Made Active in Reports: 04/12/2006
Number of Days to Update: 7

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Historical Auto Stations: EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Historical Cleaners: EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 04/20/2006
Number of Days to Update: 50

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/31/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 46

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Listings
Source: Employment Department
Telephone: 503-947-1420

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory Data
Source: Oregon Geospatial Enterprise Office
Telephone: 503-378-2166

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

BOARDMAN AFR
NORTH
BOARDMAN, OR 97818

TARGET PROPERTY COORDINATES

Latitude (North):	45.75750 - 45° 45' 27.0''
Longitude (West):	119.7822 - 119° 46' 55.9''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	283624.3
UTM Y (Meters):	5070652.0
Elevation:	617 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	45119-G7 CROW BUTTE, OR
Most Recent Revision:	1993
South Map:	45119-F7 ELLA, OR
Most Recent Revision:	1993

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

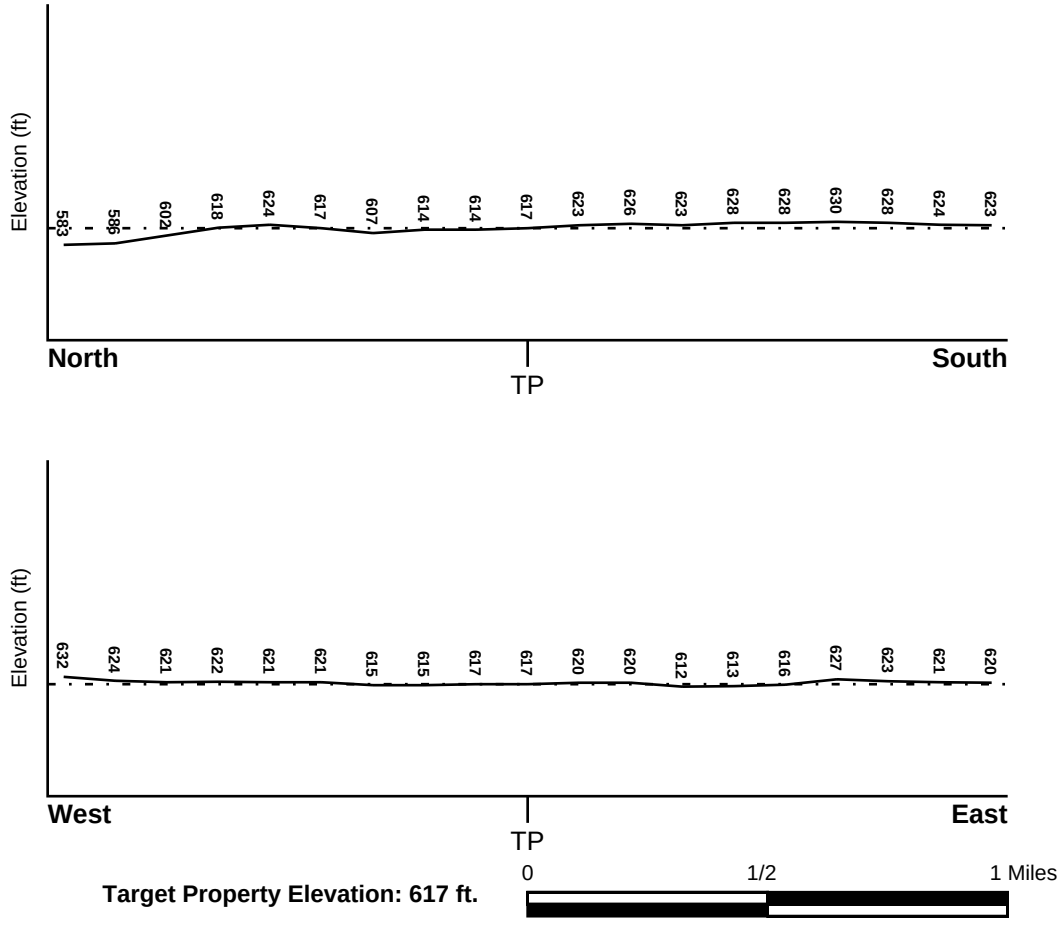
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General North

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
MORROW, OR	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 4101730125B

Additional Panels in search area: 4101730250B

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
CROW BUTTE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

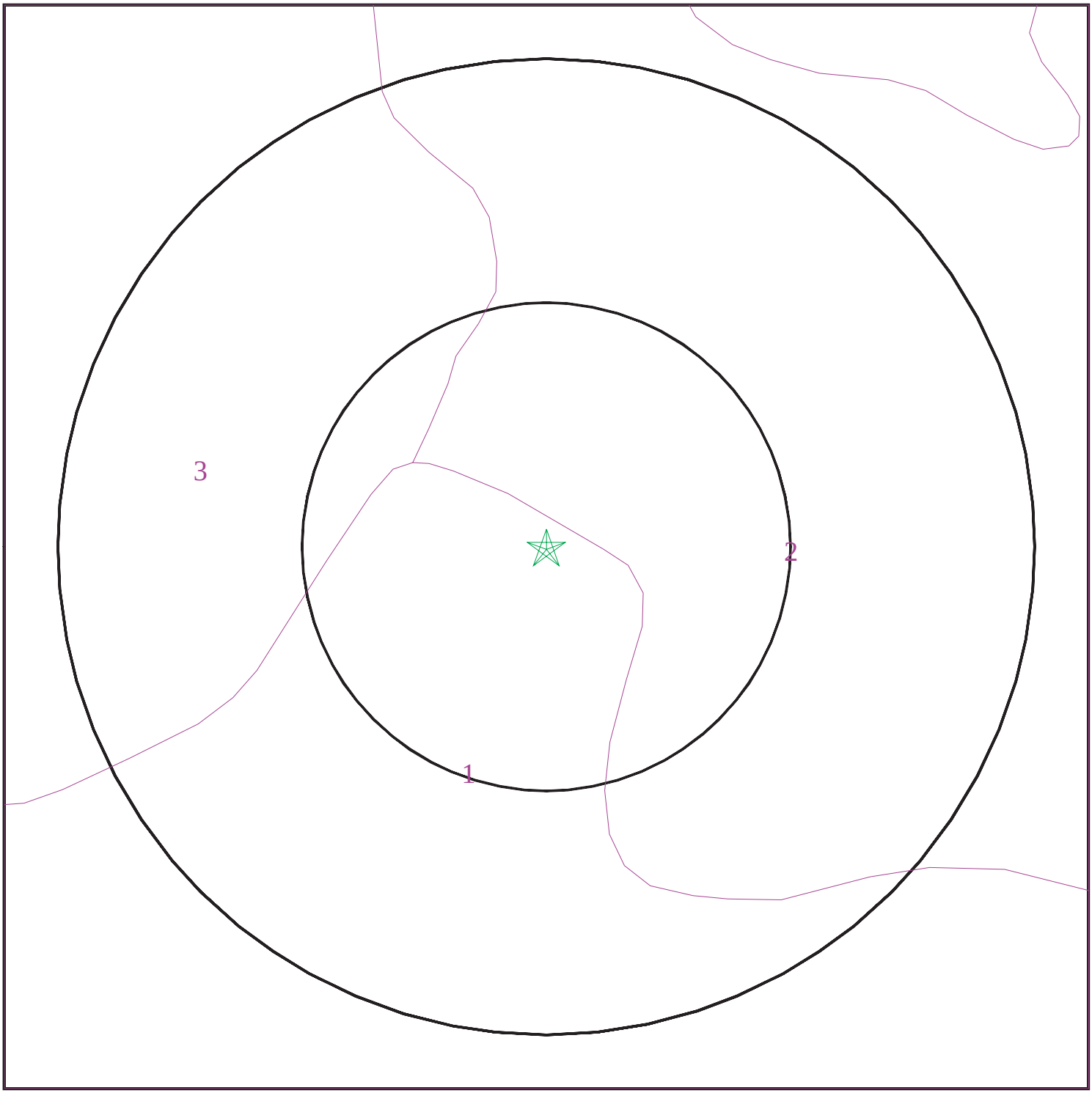
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 1692341.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Boardman AFR	CLIENT:	Shaw Env. and Infrastructure
ADDRESS:	North	CONTACT:	Jennifer Lillis
	BOARDMAN OR 97818	INQUIRY #:	1692341.2s
LAT/LONG:	45.7575 / 119.7822	DATE:	June 08, 2006

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: QUINCY

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively. Soils have very high and high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	6 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 6.10
2	6 inches	60 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 6.60

Soil Map ID: 2

Soil Component Name: KOEHLER

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat excessive. Soils have high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

Soil Layer Information

	Boundary			Classification			
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**	**Permeability Rate (in/hr)**	**Soil Reaction (pH)**
1	0 inches	4 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 7.40
2	4 inches	24 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 7.40
3	24 inches	28 inches	very gravelly - loamy fine sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 7.90
4	28 inches	32 inches	indurated	Not reported	Not reported	Max: 0.20 Min: 0.01	Max: 0.00 Min: 0.00

Soil Map ID: 3

Soil Component Name: HEZEL

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Somewhat excessive. Soils have high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

Soil Layer Information

	Boundary			Classification			
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**	**Permeability Rate (in/hr)**	**Soil Reaction (pH)**
1	0 inches	9 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 6.60
2	9 inches	30 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00	Max: 8.40 Min: 6.60
3	30 inches	60 inches	stratified	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 0.60 Min: 0.20	Max: 9.00 Min: 7.40

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

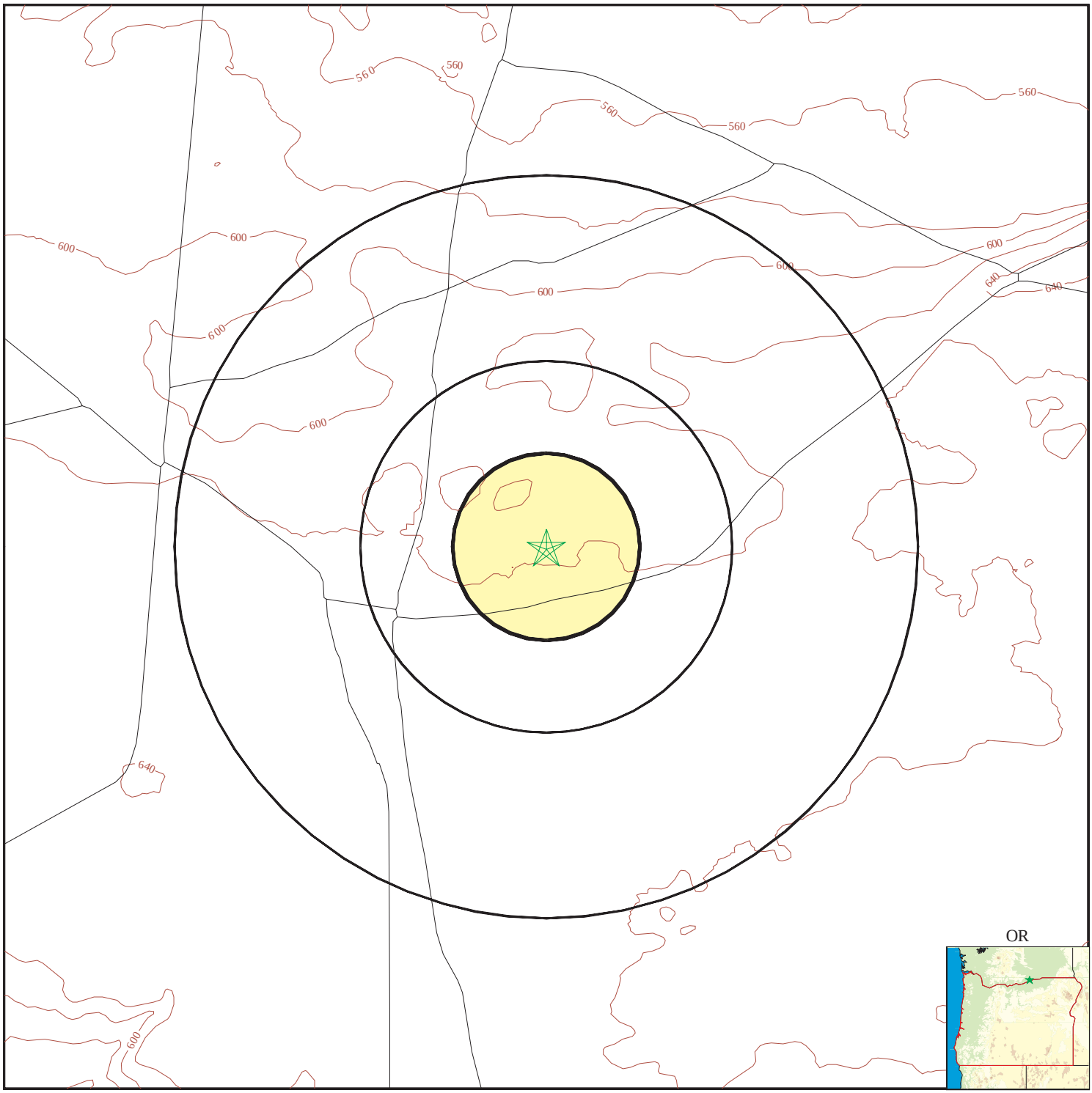
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 1692341.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location

SITE NAME:	Boardman AFR	CLIENT:	Shaw Env. and Infrastructure
ADDRESS:	North BOARDMAN OR 97818	CONTACT:	Jennifer Lillis
LAT/LONG:	45.7575 / 119.7822	INQUIRY #:	1692341.2s
		DATE:	June 08, 2006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: OR Radon

Radon Test Results

Zip	Total Sites	Min pCi/L	Max pCi/L	Avg pCi/L	>4 pCi/L
97818	1	1.0	1.0	1.0	0

Federal EPA Radon Zone for MORROW County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.
Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory Data
Source: Oregon Geospatial Enterprise Office
Telephone: 503-378-2166

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Data
Source: Department of Water Resources
Telephone: 503-986-0843

OTHER STATE DATABASE INFORMATION

RADON

State Database: OR Radon
Source: Oregon Health Services
Telephone: 503-731-4272
Radon Levels in Orgeon

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Jennifer Lillis
Shaw Env. and
9201 East Dry Creek Road
Centennial, CO 80112

Order Date: 6/8/2006 **Completion Date:** 6/8/2006
Inquiry #: 1692341.3
P.O. #: NA
Site Name: Boardman AFR
Address: North
City/State: BOARDMAN, OR 97818
Cross Streets:

Customer Project: NA
1182600MER 303-799-4241

This document reports that the largest and most complete collection of Sanborn fire insurance maps has been reviewed based on client supplied information, and fire insurance maps depicting the target property at the specified address were not identified.

NO COVERAGE

The EDR Aerial Photo Decade Package

Boardman AFR
North
BOARDMAN, OR 97818

Inquiry Number: 1692341.5

June 08, 2006

EDR® Environmental Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

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PORTLAND GENERAL ELECTRIC

BOARDMAN PLANT WATER QUALITY MONITORING PROGRAM

I. INTRODUCTION

In August 1980, Portland General Electric (PGE) began commercial operation of the Boardman Power Plant. The Plant is a 600-MW coal-fired generating plant located 10 miles south of the Columbia River and 12 miles south-southwest of Boardman in Morrow County, Oregon. At peak production, the Boardman Plant burns about 325 tons per hour of low-sulfur, western sub-bituminous coal in it's boiler. Coal is received at the Plant by train and is either fed directly to the plant or "stacked out" in the coal storage area for later use. Heat from the coal combustion is used to convert water in the boiler to steam and the steam is used to turn the turbine generator which produces electricity.

Environmental impact was a concern when siting the facility and was addressed in the Boardman Plant Site Certificate Agreement which was issued by the Oregon Energy Facility Siting Council. The Site Certificate required that the Plant meet the environmental monitoring requirements in the 1975 version of Oregon Administrative Rules Chapter 345, Division 26 "Construction and Operation Rules for Thermal Power Plants". Primary environmental impact concerns related to Plant operation can be broken down into three general categories; air, water, and terrestrial (vegetation and wildlife).

Air quality is regulated by the Oregon Department of Environmental Quality (ODEQ) under the Boardman Plant Title V Air Operating Permit (Oregon permit no. 25-0016). Monitoring required under the Title V permit is designed to ensure that the Plant complies with all State and Federal emission limits and to ensure that impacts to the environment due to air emissions are minimized. Pollutants regulated under the Title V permit include sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter (coal dust, ash, and other fugitive dusts), carbon monoxide (CO), and volatile organic carbon (VOC) compounds. An annual report summarizing emissions and compliance status is submitted to ODEQ, ODOE, and Region 10 EPA.

Terrestrial protection falls primarily under the Oregon Department of Fish and Wildlife (ODFW). There is no permit regulating terrestrial impacts at the Boardman Plant however terrestrial monitoring for Plant impacts is required under the 1975 OAR Chapter 345, Division 26. Details of this monitoring are in the Boardman Plant Terrestrial Monitoring Program. An annual report summarizing terrestrial monitoring is submitted to ODFW and ODOE.

Water quality is regulated by the Oregon Department of Environmental Quality under the Boardman Plant Water Pollution Control Facilities Permit (Oregon permit no. 100189). Carty Reservoir water is monitored to ensure compliance with limitations for maximum allowable chemical concentrations that were established in the Boardman Plant Site Certificate. Groundwater is monitored to ensure there are no impacts to the area groundwater due to leachate from the Boardman Plant Ash Disposal Area. All of the water quality monitoring requirements are consolidated into the following Boardman Plant Water Quality Monitoring Program. An annual report summarizing water quality monitoring results is submitted to ODEQ, ODOE, and OWRD.

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II. CARTY RESERVOIR QUALITY

Carty Reservoir description

Carty Reservoir (Figure 1) is a man-made impoundment with a surface area of that can vary from less than 1,000 acres at low pool (664 ft MSL) to almost 1,500 acres at full pool (677 ft MSL). Water from Carty Reservoir is used to provide the Boardman Plant with cooling water, fire water, and make-up water for the boiler. Additionally, low level processed Boardman Plant waste water is returned to the Reservoir. Because of these uses, the Reservoir is classified as an industrial waste pond and regulated by Oregon Department of Environmental Quality (ODEQ) under the Plant's Water Pollution Control Facility permit. The use of the reservoir for cooling purposes represents the greatest single use. Approximately 180,000 gallons per minute are withdrawn at the intake structure, circulated through the Plant cooling system, and returned to the reservoir at the discharge. The design of the reservoir is intended to promote maximum cooling by routing the water in a circular pattern around the reservoir.

In addition to Boardman Plant uses, PGE can supply irrigation water back to the Farms from a pumping station located on the Reservoir. Normal operating level for the reservoir is 665 ft MSL to 668 ft MSL. PGE owns water rights for adding the make up water necessary to maintain the Reservoir at the desired level. Make-up water is supplied by Three Mile Canyon Farms from the Willow Creek pump station.

Limitations for maximum allowable chemical concentrations were established by the State of Oregon through the Site Certificate Agreement to ensure the water is suitable for irrigation and other beneficial uses. The reservoir provides year-round habitat for a wide variety of vegetation and wildlife that would other wise not be present in the semi-arid climate in the Boardman area.

Carty Reservoir monitoring program

Table 1 is a list of the chemical constituents that will be routinely quantified for the Carty samples. This Table is a compilation of the Site Certificate required testing along with other constituents either required by the WPCF permit or of specific interest for Plant operation. A reservoir sample will be collected monthly at the intake structure for compliance demonstration. This sample point will be most representative of overall reservoir quality due to the circulation effect of the cooling water. Samples will also be collected at the Willow Creek pumping station during months when water is being made-up to the reservoir and from the vicinity of the reservoir irrigation withdrawal pumps during months that PGE supplies irrigation water to Three Mile Canyon Farm. Data will also be recorded for total monthly volumetric flow of make-up water to Carty and irrigation withdrawl from Carty.

Figure I - 1 Boardman Plant - Carty Reservoir

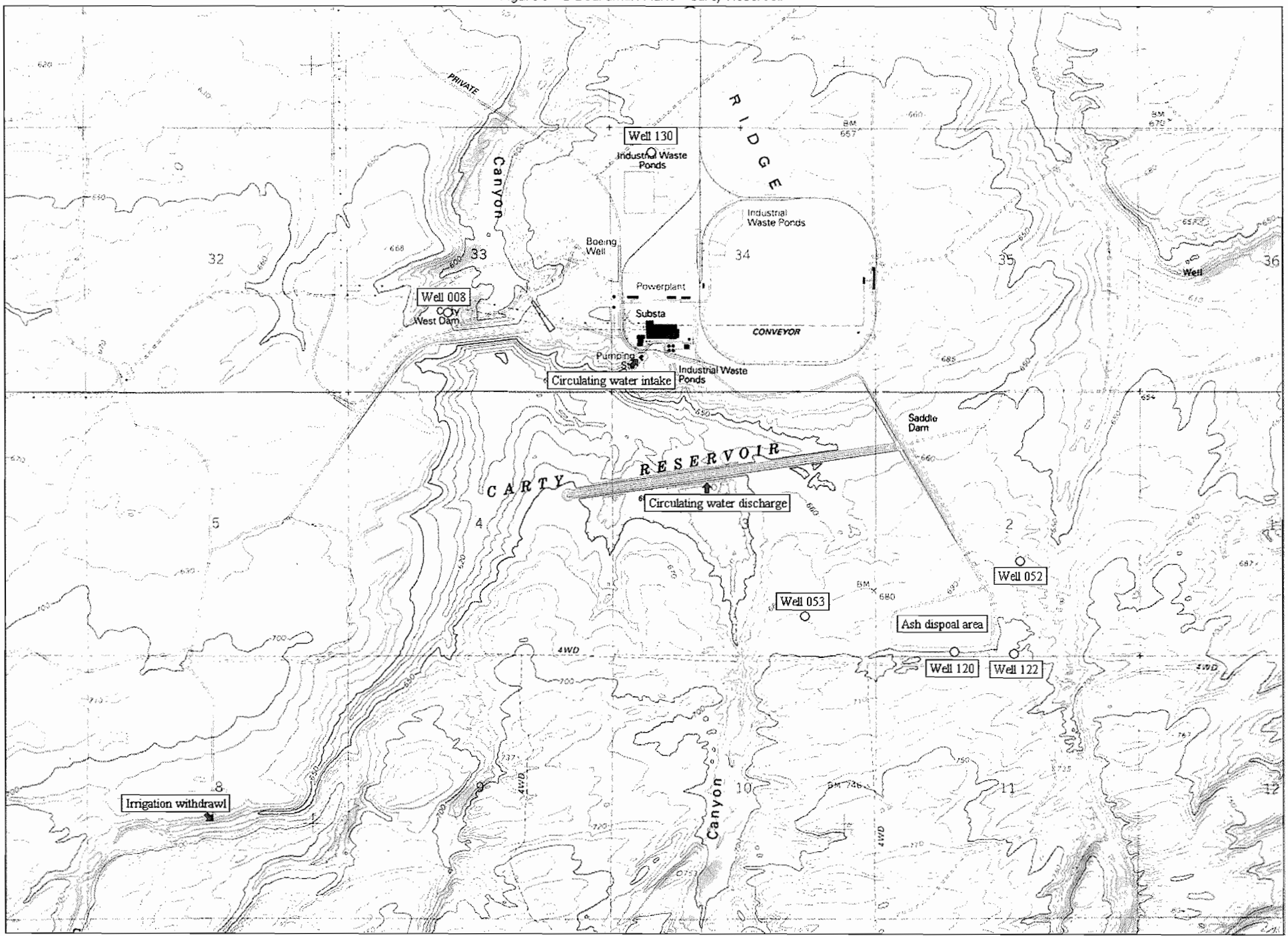

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Table 1

Boardman Plant

Water Quality Parameters

Constituent	Reason for Analysis	Site Certificate Limit
Aluminum*	DEQ request	NA
Arsenic	Site Certificate	1 mg/l
Beryllium*	DEQ request	NA
Boron	Site Certificate	0.5 mg/l
Calcium	Site Certificate	500 mg/l
Cadmium	Site Certificate	0.01 mg/l
Chromium	Site Certificate	0.05 mg/l
Copper	Site Certificate	0.1 mg/l
Iron	WPCF Permit	NA
Lead*	DEQ request	NA
Potassium	Plant operation information	NA
Magnesium	Site Certificate	250 mg/l
Manganese*	DEQ request	NA
Mercury	Site Certificate	0.01 mg/l
Selenium*	DEQ request	NA
Sodium	Site Certificate	1000 mg/l
Vanadium*	DEQ request	NA
Zinc	Site Certificate	0.1 mg/l
Alkalinity, bicarbonate	Site Certificate	500 mg/l
Alkalinity, carbonate	Plant operation information	NA
Alkalinity, total	WPCF Permit	NA
Chloride	Site Certificate	100 mg/l
Fluoride	Site Certificate	1 mg/l
Nitrate	Site Certificate	200 mg/l
Silica	Plant operation information	NA
Sulfate	Site Certificate	200 mg/l
Total dissolved solids	Site Certificate	1000 mg/l
pH	Site Certificate	No limit
Specific conductivity	WPCF permit	NA
Sodium adsorption ratio	Site Certificate	6.0

* These parameters are not applicable to the surface water samples and will be analyzed once every five years on the groundwater samples.

III. GROUNDWATER QUALITY

Geological information

The Boardman Plant site lies on an 80-mi-wide, north-sloping plain underlain by bedrocks of Columbia River basalt and the Dalles formation. The plain and low plateau of the site area are part of a regional downward warp with a 0.5- to 1.5-degree northward slope. Present landforms were established in the Pleistocene, after earlier basalt flows and geologic deformations. Though alluvial deposits cover parts of the bedrock, subsequent erosion has bared various landforms.

Windblown sands and loess form a thin mantle over the Dalles formation (averaging 10 ft thick) consisting of caliche-cemented silt intermixed with thin layers of cemented gravels. These basaltic gravels are derived from the Blue Mountains south of the area. The Boardman Plant site has 10-ft-thick Elephant Mountain flow basalt underlying the Dalles formation; however, this flow disappears in the reservoir area and is not present at the Ash Disposal Area. These basalts are hard, dense, close-jointed, and fine-grained.

The Rattlesnake Ridge member of the Ellensburg formation underlies the Elephant Mountain flows. This member consists of weakly cemented silts and clays with occasional pockets of caliche. At the plant site, the Rattlesnake Ridge member is about 20 to 35 ft thick but tends to pinch out about 0.5 mi south of the plant site and is not present in the Ash Disposal Area.

The Pomona flow of the Yakima basalt underlies the Rattlesnake Ridge formations. Each Yakima basalt flow has a vesicular top, a dense, massive center, and a basal part that varies from dense to fragmented. As in the Elephant Mountain flow, groundwater movement in the Pomona flow occurs mainly in the permeable, scraggly top and bottom parts. These rocks are largely impervious to vertical water flow.

Unnamed lava flows beneath the Pomona flow are referred to as "Columbia River basalt, undifferentiated". These basalts are estimated to be 2,000 to 3,000 ft thick. None of the borings made at the Boardman site has completely penetrated these rocks. Under the Ash Disposal Site, the Pomona Basalt directly overlays the Columbia River Basalts. Columbia River basalts contain the most widespread and productive aquifers in the area. The natural groundwater body at the Boardman site is at least 350 ft below the surface in Columbia River basalts. A perched groundwater lens has been formed atop the Pomona flow due to the surface water of Carty Reservoir. In adjacent agricultural areas, there is also shallow perched groundwater lens and seepage associated with the Elephant Mountain flows. Due to elevation differences, recharge from the Columbia River (MSL at about 275 feet) into shallow wells does not occur in the area of the Boardman Plant (at about 650 feet MSL).

Carty Reservoir was expected to add about 1,000 ac-ft annually to nearby groundwaters; however, monitoring data suggest about 2,000 ac-ft may be more realistic since the previously desert soils have become saturated. The water quality of the seepage from Carty Reservoir is better than naturally occurring groundwater. Thus, the reservoir will temporarily increase the quantity and probably the quality of water and is viewed as an environmental benefit. The reservoir also creates an adjacent perched water lens that will cease to exist after the plant and the reservoir are decommissioned. It is important to understanding the perched groundwater formed by irrigation and the seepage of the reservoir, that the alluvium is both loess and possible sediments from pre-historic Lake Condon formed when the glacial-fluvial deposits and water flowed from the ice dams in Montana. These floodwaters are collectively known as the Bretz

Floods. Also the very arid environment encourages evaporation of water at the surface and the formation of playas which are high in mineral salts. When new water first encounters playas, the dissolution of minerals may be high.

Ash disposal area

Ash from coal combustion averages 4 to 6 percent by weight of the total coal burned with approximately two-thirds being fly ash that is collected by the electrostatic precipitator. Bottom ash and economizer ash which fall out in the boiler upstream of the electrostatic precipitation are the balance of the material. Most of the ash, especially fly ash and bottom ash, is collected and sold; the rest is sealed in the ash disposal area southeast of Carty Reservoir Figure 1.

Design and operation criteria for the ash disposal area are contained in the Boardman Plant Ash Disposal Plan – PGE 3003. The ash disposal area is isolated from the reservoir by dikes which physically contain and support the stabilized ash. This site can contain up to 4,000 ac-ft of ash when filled to the maximum designed elevation (725 ft MSL). An interceptor dike has been constructed to divert any natural runoff, including flash floods, around the disposal area. The bottom of the ash disposal area is about 8 feet above the highest reservoir water level and is lined with compacted, hydrated ash, which forms a hard, impermeable layer (fly ash of this particular coal source when wetted sets up like low-grade cement). This liner with a 1 x 10 E-7 cm/s permeability rate should effectively prevent any leachate from entering the groundwater. If any excess water occurs in the ash disposal processes, it is contained on-site and used or evaporated within the disposal area. Average annual precipitation in the area is about 9 inches per year and evaporation is about 50 inches per year and there was no natural subsurface groundwater aquifer in this area before the reservoir was constructed and adjacent agriculture occurred. Simulated leaching tests performed on the ash indicate that chemical concentrations, with three exceptions, would be within the Site Certificate limits for Carty Reservoir quality. Boron, fluoride, and zinc slightly exceeded the limits.

Unlined evaporation pond

The unlined evaporation pond is located north of the Plant (Figure 1). The area of the impoundment is 10 acres with a depth of 10 feet however there is typically no standing water in the pond due to the high evaporation rate in the area. This pond receives wastewater which is too high in dissolved solids for discharge to Carty Reservoir. These wastes are predominantly a result of regenerating ion exchange materials used in the Plant water treatment system and the solids consist primarily of sodium sulfate.

Groundwater monitoring

Groundwater is monitored pursuant to OAR 345-26-060(3)(e) (1975 edition) and to meet PGE internal needs. The Water Pollution Control Facilities permit from the Oregon Department of Environmental Quality also requires groundwater monitoring for the Ash Disposal Area of the Boardman Plant.

Information on the monitoring wells that will be sampled is listed in Table 2 and the locations of these wells are shown on Figure 1. The wells will be sampled once per year in the spring unless there is indication of a water quality change in which case wells will be sampled again in the fall. All samples will be analyzed for the same list of parameters as Carty Reservoir (Table 1). Annual data on total ash deposition to the disposal area will also be recorded and reported for WPCF permit purposes.

Table 2

BOARDMAN GROUNDWATER MONITORING PROGRAM – MONITORING WELLS

Well Number	Well depth (f)t	Reference Level, top of riser (ft MSL)	Geological Formation	Location and Rational For Sampling
008	108	663.5	Pomona Basalt	North of Carty Reservoir. Monitors for comparison of effects of perched water and Carty Seepage.
052	70	680.9	Pomona Basalt	Southeast of Carty in perched water northeast of ash disposal. Monitors ash disposal area.
053	78	693.4	Pomona Basalt	South of Carty in perched water northwest of ash disposal area. Monitors ash disposal area.
120	68.5	701.8	Pomona Basalt	South of Carty in perched water south of ash disposal area. Monitors ash disposal area.
122	68.7	704.6	Pomona Basalt	South of Carty and east of ash disposal site. Monitors ash disposal area.
130	72	664	Elephant Mountain Basalt	North of unlined wastewater evaporation pond. Monitors for seepage from the pond.

Note: John Day Pool of Columbia River, approximately 275 ft. MSL.
Carty Reservoir normal operation pool 665 - 668 ft. MSL

IV. SAMPLING AND ANALYSIS PROTOCOLS

Sampling

All sampling will follow PGE-established procedures: ES-209 "Carty Reservoir Water Quality Sampling" and ES-216 "Boardman Groundwater Sampling"

Analysis

Chemical analysis will be performed by a reputable commercial environmental laboratory using standard EPA procedures for analysis and quality control. Results will be reported based on the standard method detection limits established in the procedures.

V. REPORTING

An annual report, "Boardman Plant Annual Water Quality Report", will be submitted within 90 days from the end of the calendar year. In addition to water quality data, this report will include Carty Reservoir water balance information for Oregon Water Resources Department as well as all reporting required by ODEQ under the Water Pollution Control Facilities permit.

PGE Boardman Plant
2005 Water Quality Monitoring Report

I. **Introduction** – This annual report is designed to provide necessary information regarding Boardman Plant water quality monitoring requirements established in the Water Quality Monitoring Program approved by Oregon Energy Facility Siting Council and the Water Pollution Control Facility Permit (WPCF permit #100189) issued by Oregon Department of Environmental Quality.

II. **Carty Reservoir** – Samples were collected monthly at the Boardman Plant intake structure by PGE personnel. Chemical analyzes were done by North Creek Analytical Laboratory. The analysis results are used to demonstrate compliance with chemical limits established in the Boardman Site Certificate and to trend overall water quality. Table 1 lists the monthly results for cations/metals and Table 2 lists the results for anions and other parameters. The data shows that none of the Site Certificate limits were exceeded during the reporting period. Tables 3 and 4 list the annual averages for these parameters going back to 1981. Figure 1 is a graph showing the trend of major ion concentrations from 1981 – 2005. The general trend for these ions was increasing concentration until 2001 at which time PGE implemented a program to "blow down" the reservoir by providing irrigation water to Three Mile Canyon Farms.

III. **Carty Reservoir Make-Up and Irrigation Withdrawal** – For the reporting period, the total make-up water pumped to Carty by Three Mile Canyon Farms was 10,747 acre-feet and the total irrigation water withdrawn from Carty was 578 acre-feet. Following is a summary of monthly reservoir make-up and withdrawal quantities (in acre-feet) for the reporting period;

Month	Carty Water Level (ft.)	Make-up Water	Irrigation Withdrawal
Jan. 05	666.7	0	0
Feb. 05	666.2	0	0
Mar. 05	665.7	90	0
Apr. 05	665.8	808	0
May 05	665.3	126	0
June 05	665.3	1226	0
July 05	665.8	1915	0
Aug. 05	665.3	914	0
Sept. 05	668.1	4216	0
Oct. 05	668.1	1452	578
Nov. 05	667.7	0	0
Dec. 05	667.8	0	0
Total		10,747	578

Samples from the make-up and withdrawal points were collected by PGE personnel and analyzed by North Creek Analytical Laboratory. Tables 5 and 6 contain make-up water analytical data for months in which water was pumped into Carty and Tables 7 and 8 contain irrigation withdrawal analytical data for the for month in which water was pumped out of Carty. As expected, water quality of the irrigation withdrawal was essentially the

same as the Carty Reservoir samples. Water quality of the make-up varied seasonally depending on influences of the Columbia River and Willow Creek.

IV. **Groundwater** – Samples were collected from monitoring wells in March by PGE personnel and analyzed by North Creek Analytical Laboratory. The analysis results are used to demonstrate that Plant operation causes no adverse impact to groundwater, primarily from ash disposal area leaching. Following is information on each monitoring well in the program;

Well 008 is just north of the West Dam. The screened area is in the top of the Pomona basalt with a grout or bentonite seal above the screened area to the surface. This well extends 21 feet into the Pomona Basalt. The screened area is the 10-foot section between 93 and 103 feet so that it is entirely within the Pomona Basalt. The upper 5 feet of the basalt is permeable, but the rest of the well hole below (the last 16 feet) is hard, dense basalt rock. Because it is west of any plant-related activities and is sealed from influences of overlying aquifers, Well 008 is assumed to measure the water quality of seepage from Carty Reservoir and is used as the base comparison for other well waters which monitor the Pomona basalt. Tables 9 and 10 contain annual average analytical data for this well from 1981 – 2005.

Well 052 is approximately 250 yards northeast of the ash disposal area in a low area southeast of the reservoir. Static water levels in Well 052 from 1982 through the 1984 season were so shallow (0.1 to 0.3 ft) that sampling was impossible. The water level in this well rose 18.7 ft in 1985. From 1986 to 1996 the static water level continued to rise. Since 1997, the well levels had appeared to stabilize around 40 feet. This well extends about 20 feet into the Pomona Basalts. The first few feet in the Pomona are permeable then the well hole is in hard, dense basalt. The 10-foot screened area is below the top of the basalt with a bentonite and grout seal to the surface. There is a question about whether Well 052 is within the perched lens of the reservoir. When the well was drilled in 1979, no water was encountered. Seepage from the reservoir does not appear to extend to the southeast however there are no readily apparent sources of water nearby. There are agricultural fields to the south, and up gradient, beyond Immigrant Road, which have increased in number since the wells were drilled. Thus, underground flow from the south may be occurring. Tables 11 and 12 contain annual average analytical data for this well from 1981 – 2005.

Well 053 is between the reservoir and the bermed ash disposal site approximately 500 yards northwest of the ash disposal area. The well has a grout or bentonite seal to the interface between the Pomona basalt and the overlying alluvium. There are no overlying formations or other basalts between the Pomona and the alluvial surface that makes up the first 41 feet of the well hole. Well 053 extends 37 ft into the Pomona basalt. The 10-foot screened area is entirely within the Pomona Basalts starting 63 feet below the ground surface. Well 053 is in the perched water lens of Carty Reservoir. Tables 13 and 14 contain annual average analytical data for this well from 1981 – 2005.

Well 120 is approximately 25 yards south of the ash disposal area at it's midpoint. This well is in the Pomona Basalts that rest directly on the Columbia River Basalts. The Columbia River Basalts have a 1 % slope to the north so that seepage of water south of Well 120 will

be limited by these hard, dense basalts to a level even with the mean sea level of the reservoir or the hydraulic pressure from the reservoir. Well 120 is 68.5 feet deep, extending about 20 feet into the Pomona Basalt with a seal above the Pomona basalt interface. The screened area is entirely within the Pomona Basalt. Water was first measured in Well 120 in March 1987 about seven years after the well was installed. The perched water lens is now about 45 feet below the present 40-acre ash disposal site. This level plus or minus a foot has been maintained since 1997. Tables 15 and 16 contain annual average analytical data for this well from 1981 - 2005.

Well 122, approximately 150 yards southeast of the ash disposal area, is also in the Pomona Basalt. This well is dry and has been since it was installed in 1980.

Well 130 is directly north of the Unlined Wastewater Pond northwest of the Boardman Plant. This well is 72 feet deep and monitors for groundwater seepage from the Unlined Pond. The static water level in this well has remained the same as the depth of the well and there has never been sufficient water to sample since it was installed in 1980.

Summary; Neither the operation of the Boardman Coal-Fired Plant, the ash disposal facilities, nor the reservoir have shown any adverse impacts on groundwater quality. Figures 2 through 9 show trends of major ion concentrations from 1981 to the present for monitoring wells 008, 052, 053, 120 and Carty Reservoir. Well 008 continues to show water quality based on Carty reservoir seepage. To a lesser degree, wells 053 and 120 also show impact from Carty reservoir. The major chemical constituents of these wells have changed with time as the salts in the saturated soils equilibrate with the perched water lens from Carty. Trace metal concentrations have remained consistently very low over the entire period.

V. **Ash Disposal** - In 2005 approximately 82% of the ash generated at the Boardman Plant was sold for beneficial use. For 2005;

	Bottom ash	Economizer ash	Fly ash	Total
Ash sold	400 tons	3,625 tons	78,401 tons	82,426 tons
Ash disposed	17,515 tons	0 tons	0 tons	17,515 tons

VI. **Unlined Pond** – The WPCF requires quarterly data for flow, pH, TDS, and Ammonia-Nitrogen on the unlined wastewater pond. 2005 data;

Quarter	Flow (gal.)	pH	TDS (mg/l)	Ammonia (mg/l)
1st	4,100,836	6.1	8,800	1.09
2nd	2,888,244	9.4	5,620	0.388
3rd	2,792,364	9.5	8,650	17.2
4th	1,926,624	7.3	13,800	0.363

VII. **Sewage Lagoons** – The WPCF requires chlorination of sewage lagoon water prior to discharge into the sewage evaporation seepage cell. No chlorination was required during 2005 because no water was discharged to the seepage cell during this period.

Table 1.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Cation/Metals Concentrations (mg/l)

	Arsenic	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Magnesium	Mercury	Potassium	Sodium	Zinc
January	0.00324	0.135	<0.001	30.2	<0.001	0.00885	1.78	14.6	<0.0002	4.96	32.7	<0.005
February	0.00271	0.077	<0.001	24.9	<0.001	0.00651	0.05	17.2	<0.0002	4.55	31.1	<0.005
March	0.00312	0.094	<0.001	26.6	<0.001	0.00796	0.03	17.6	<0.0002	5.43	30.7	<0.005
April	0.00220	0.122	<0.001	28.2	<0.001	0.00743	0.06	17.8	<0.0002	3.81	32.4	<0.001
May	0.00271	0.094	<0.001	28.3	<0.001	0.00591	<0.1	18.4	<0.0002	4.75	33.2	<0.01
June	0.00412	0.099	<0.001	24.1	<0.001	0.00944	<0.1	19.4	<0.0002	5.14	35.1	<0.005
July	0.00470	0.113	<0.001	20.9	<0.001	0.00871	<0.1	17.9	<0.0002	4.30	32.0	<0.005
August	0.00450	0.102	<0.001	17.7	<0.001	0.00721	<0.1	19.1	<0.0002	4.42	34.1	<0.005
September	0.00474	0.140	<0.001	17.3	<0.001	0.00632	<0.1	17.9	<0.0002	3.63	32.4	<0.005
October	0.00441	0.122	<0.001	18.7	<0.001	0.00655	0.10	17.0	<0.0002	4.44	33.8	<0.005
November	0.00509	0.097	<0.001	20.0	<0.001	0.00673	0.23	16.1	<0.0002	4.25	28.5	<0.005
December	0.00401	0.168	<0.001	21.5	<0.001	0.00397	0.19	16.6	<0.0002	3.85	28.9	0.005
Average	0.00380	0.114	<0.001	23.2	<0.001	0.00713	0.25	17.5	<0.0002	4.46	32.1	<0.005
Site Cert. Limit	1.0	0.5	0.01	500	0.05	0.1	NA	250	0.01	NA	1000	0.1

NA - indicates there is no Site Certificate Limit for this parameter.

Table 2.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	SAR	Cond	pH	Temp.
January	139	21.2	0.4	0.2	5.8	38.5	239	1.22	377	8.1	10.1
February	148	21.4	0.4	0.2	5.9	40.9	239	1.17	381	8.4	12.9
March	150	22.0	0.3	0.1	4.1	42.3	248	1.13	388	8.5	15.4
April	144	23.9	0.4	<0.1	0.2	43.4	256	1.18	398	8.3	17.6
May	148	22.6	<0.5	<0.1	0.9	40.1	262	1.19	392	8.6	18.7
June	128	23.3	<0.5	<0.1	2.1	42.2	258	1.29	389	8.7	23.8
July	112	22.8	<0.5	<0.1	2.8	40.6	247	1.24	368	8.8	25.3
August	99	22.7	<0.5	<0.1	3.4	40.0	231	1.34	352	8.8	27.8
September	114	21.7	<0.5	<0.1	2.0	38.0	227	1.30	344	8.6	23.0
October	131	20.1	<0.5	<0.1	3.6	35.9	221	1.36	343	8.4	20.8
November	123	19.6	<0.5	<0.1	4.0	35.3	213	1.15	340	8.2	11.3
December	129	20.0	<0.5	<0.1	4.1	35.4	220	1.14	371	8.0	5.0
Average	130	21.8	<0.5	0.1	3.2	39.4	238	1.23	370	8.5	17.6
Site Cert. Limit	500	100	1.0	45	NA	200	1000	6.0	NA	NA	NA

NA - indicates there is no Site Certificate Limit for this parameter.

Table 3.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Annual Average Cation/Metals Concentrations (mg/l)

	Arsenic	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Magnesium	Mercury	Potassium	Sodium	Zinc
1981	0.002	0.1	<0.0001	24	<0.0005	0.006	0.06	10	<0.0002	2.8	15	0.006
1982	0.003	0.2	<0.0001	27	<0.0005	0.006	0.06	9	<0.0002	3.2	16	0.003
1983	0.002	0.2	<0.0001	26	0.0008	0.004	0.08	10	<0.0002	3.3	17	0.003
1984	0.002	0.2	<0.0001	28	<0.0005	0.006	0.07	11	<0.0002	3.5	19	0.005
1985	0.003	0.3	<0.0001	27	<0.0005	0.005	0.07	13	<0.0002	3.9	21	0.005
1986	0.003	0.2	0.0001	24	<0.0005	0.004	0.06	14	<0.0002	3.9	22	0.003
1987	0.004	0.2	0.0001	25	0.0011	0.003	0.16	14	<0.0002	3.8	22	0.015
1988	0.004	0.2	<0.0001	25	0.0006	0.003	0.06	14	<0.0002	4.0	24	0.003
1989	0.003	0.2	<0.0001	26	0.0013	0.004	0.06	13	<0.0002	3.9	23	0.005
1990	0.003	0.2	<0.0001	25	<0.0005	0.004	0.07	13	<0.0002	3.8	23	0.003
1991	0.006	0.1	0.0001	26	0.0010	0.008	0.07	14	<0.0002	3.6	24	0.012
1992	0.004	0.1	<0.0001	25	0.0006	0.009	0.13	15	<0.0002	4.1	28	0.014
1993	0.003	0.1	<0.0001	23	<0.0005	0.009	0.05	15	<0.0002	4.1	30	0.017
1994	0.004	0.1	<0.0001	24	<0.0005	0.009	0.04	16	<0.0002	4.2	31	0.019
1995	0.003	0.1	<0.0001	23	<0.0005	0.006	0.05	16	<0.0002	4.1	30	<0.002
1996	0.003	0.1	<0.0001	24	<0.0005	0.005	0.06	16	<0.0002	4.3	30	0.007
1997	0.003	0.1	<0.0001	24	0.0010	0.005	0.21	16	<0.0002	4.4	30	0.010
1998	0.005	0.1	0.0001	25	0.0020	0.005	0.11	18	<0.0002	4.7	32	0.014
1999	0.004	0.1	<0.0001	24	0.0020	0.005	0.09	19	<0.0002	5.0	36	<0.001
2000	0.004	0.2	<0.0001	23	0.0016	0.005	0.09	19	<0.0002	4.8	36	<0.001
2001	0.005	0.1	<0.0001	25	0.0008	0.006	0.11	22	<0.0002	5.3	40	0.012
2002	0.004	0.1	0.0001	25	0.0008	0.007	0.16	22	<0.0002	6.5	35	0.002
2003	0.004	0.1	0.0001	24	0.0015	0.008	0.11	20	<0.0002	4.7	36	0.003
2004	0.003	0.1	<0.001	24	<0.001	0.008	0.20	18	<0.0002	4.6	33	<0.005
2005	0.004	0.1	<0.001	23	<0.001	0.007	0.25	18	<0.0002	4.5	32	<0.005
Site Cert. Limit	1.0	0.5	0.01	500	0.05	0.1	NA	250	0.01	NA	1000	0.1

NA - indicates there is no Site Certificate Limit for this parameter.

Table 4.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Annual Average Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	SAR	Conductivity	pH
1981	110	7	0.3	0.6	2.0	19	158	0.7	240	8.5
1982	111	8	0.3	1.2	1.8	20	169	0.7	276	8.2
1983	112	9	0.3	0.6	3.3	19	171	0.7	263	8.2
1984	116	10	0.3	0.3	2.1	19	176	0.8	325	8.5
1985	118	12	0.4	0.2	2.1	22	190	0.8	342	8.5
1986	123	14	0.4	0.3	3.1	23	200	0.9	337	8.7
1987	112	14	0.4	0.2	3.1	22	187	0.9	353	8.6
1988	120	16	0.4	0.2	4.2	22	202	0.9	378	8.2
1989	120	15	0.4	0.2	3.3	23	200	0.9	356	8.4
1990	117	16	0.4	0.2	1.9	21	192	0.9	370	8.6
1991	115	16	0.4	0.1	2.9	26	208	1.0	373	8.5
1992	112	15	0.4	0.2	3.4	38	213	1.1	329	8.5
1993	111	16	0.4	0.1	2.9	42	225	1.2	357	8.7
1994	120	17	0.4	0.1	2.1	40	228	1.2	353	8.3
1995	119	17	0.5	0.1	2.0	39	220	1.2	378	8.9
1996	123	18	0.5	0.1	2.8	39	222	1.2	389	8.6
1997	129	19	0.5	0.2	3.7	39	221	1.2	392	8.5
1998	129	21	0.4	0.5	3.6	44	224	1.2	405	8.5
1999	135	24	0.5	0.2	3.3	47	224	1.3	442	8.3
2000	124	25	0.5	0.4	3.2	46	244	1.3	434	8.6
2001	133	31	0.6	0.2	3.1	45	261	1.4	444	8.9
2002	129	27	0.5	0.1	3.8	45	258	1.2	472	8.8
2003	117	25	0.5	0.2	2.5	39	237	1.3	419	8.9
2004	124	23	<0.5	<0.1	2.9	38	235	1.3	380	8.5
2005	130	22	<0.5	0.1	3.2	39	238	1.2	370	8.5
Site Cert. Limit	**500**	**100**	**1.0**	**45**	**NA**	**200**	**1000**	**6.0**	**NA**	**NA**

NA - indicates there is no Site Certificate Limit for this parameter.

Table 5.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Make-up Water Cation/Metals Concentrations (mg/l)

	Arsenic	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Magnesium	Mercury	Potassium	Sodium	Zinc
January	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	0.00145	<0.1	<0.001	21.5	<0.001	0.0028	0.31	5.96	<0.0002	1.70	6.52	0.011
April	0.0011	0.1	<0.001	23.3	<0.001	<0.001	0.10	6.69	<0.0002	1.24	9.39	<0.01
May	0.00129	0.1	<0.001	22.5	<0.001	0.0017	1.21	7.48	<0.0002	2.36	11	<0.01
June	<0.001	0.027	<0.001	14.8	<0.001	<0.002	0.67	4.33	<0.0002	1.15	4.24	0.0067
July	0.00118	0.073	<0.001	16.2	<0.001	<0.002	0.70	4.12	<0.0002	<1.0	3.75	<0.005
August	0.00105	0.027	<0.001	17.4	<0.001	<0.002	0.28	4.79	<0.0002	<1.0	3.84	0.0051
September	<0.001	0.078	<0.001	18.3	<0.001	<0.002	0.43	4.81	<0.0002	1.01	4.64	<0.005
October	0.00112	0.018	<0.001	20.7	<0.001	<0.002	0.34	5.60	<0.0002	1.30	5.23	<0.005
November	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
December	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	0.00120	0.052	<0.001	19.3	<0.001	0.002	0.51	5.47	<0.0002	1.46	6.08	0.008

NA - indicates no water pumped into Carty for that month.

Table 6.
PGE Boardman Plant - 2005 Water Quality Report
Carty Reservoir Make-up Water Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	SAR	Cond.	pH	Temp.
January	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	73.7	3.9	0.1	0.2	7.5	15.6	112	0.4	174	8.4	10.0
April	82.6	5.9	0.1	0.4	7.9	18.6	128	0.4	206	8.0	13.3
May	91.2	4.5	<0.5	0.4	22.4	11.0	156	0.5	206	8.0	15.6
June	57.3	2.1	<0.5	<0.1	8.6	9.3	88	0.2	139	7.9	18.9
July	56.5	1.8	<0.5	<0.1	8.0	9.0	87	0.2	125	8.0	20.8
August	63.0	1.9	<0.5	<0.1	7.7	9.8	90	0.2	132	8.1	23.5
September	65.4	2.2	<0.5	<0.1	7.0	11.3	92	0.3	139	8.3	20.2
October	69.1	2.8	<0.5	<0.1	6.2	12.8	103	0.3	147	8.1	16.2
November	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
December	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	69.9	3.1	0.1	0.3	9.4	12.2	107.0	0.3	158.5	8.1	17.3

NA - indicates no water pumped into Carty for that month.

Table 7.
PGE Boardman Plant - 2005 Water Quality Report
Irrigation Withdrawal Cation/Metals Concentrations (mg/l)

	Arsenic	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Magnesium	Mercury	Potasium	Sodium	Zinc
January	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
April	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
June	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
July	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
August	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
September	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
October	0.00432	0.131	<0.001	18.4	<0.001	0.00625	<0.1	17.1	<0.0002	4.49	34.2	<0.005
November	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
December	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	0.00432	0.106	<0.001	18.4	<0.001	0.00625	~~0.104~~ <0.1	17.1	<0.0002	4.49	34.2	<0.005

NA - indicates no irrigation water was pumped from Carty for that month. No sample was collected in November 2004 because water was only pumped one day that month.

Table 8.
PGE Boardman Plant - 2005 Water Quality Report
Irrigation Withdrawal Anions Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	SAR	Cond	pH	Temp.
January	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
April	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
June	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
July	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
August	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
September	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
October	115	20.0	<0.5	<0.1	2.75	35.8	212	1.38	331	8.5	20.6
November	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
December	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	115	20.0	<0.5	0.1	2.75	35.8	212	1.38	331	8.5	20.6

NA - indicates no irrigation water was pumped from Carty for that month. No sample was collected in November 2004 because water was only pumped one day that month.

Table 9.
PGE Boardman Plant - 2005 Water Quality Report
Well #008 Annual Average Cation/Metals Concentrations (mg/l)

	Aluminum	Arsenic	Beryllium	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Mercury	Selenium	Sodium	Vanadium	Zinc
1981	<0.10	0.016	<0.001	0.1	<0.001	23	<0.001	0.007	<0.04	<0.005	12	0.0006	<0.005	29	0.038	0.052
1982	<0.10	0.014	<0.001	0.2	<0.001	26	<0.001	0.006	<0.04	<0.005	14	<0.0002	<0.005	27	0.044	0.029
1983	<0.10	0.015	<0.001	0.2	<0.001	25	<0.001	0.004	<0.04	<0.002	14	<0.0002	<0.005	27	0.043	0.059
1984	<0.10	0.008	<0.001	0.2	<0.001	27	<0.001	0.004	<0.04	<0.002	14	<0.0002	<0.005	27	0.024	0.038
1985	<0.10	0.011	<0.001	0.3	<0.001	30	0.002	0.008	0.26	<0.002	20	<0.0002	<0.005	28	0.038	0.035
1986	<0.10	0.009	<0.001	0.3	<0.001	29	<0.001	0.002	<0.04	<0.002	17	<0.0002	<0.005	28	0.038	0.026
1987	<0.10	0.010	<0.001	0.3	<0.001	31	<0.001	0.006	<0.04	<0.002	17	<0.0002	<0.005	28	0.042	0.012
1988	<0.10	0.013	<0.001	0.4	<0.001	32	<0.001	0.003	<0.04	<0.002	17	<0.0002	<0.005	28	0.043	0.014
1989	<0.10	0.008	<0.001	0.2	<0.001	31	<0.001	0.003	<0.04	<0.002	17	<0.0002	<0.005	26	0.035	0.023
1990	<0.10	0.011	<0.001	0.2	<0.001	32	<0.001	0.006	<0.04	<0.002	17	<0.0002	<0.005	28	0.033	<0.005
1991	<0.10	0.011	<0.001	0.2	<0.001	34	<0.001	0.002	0.01	<0.002	18	<0.0002	<0.005	29	0.038	<0.005
1992	<0.10	0.013	<0.001	0.2	<0.001	35	<0.001	<0.002	<0.01	<0.002	18	<0.0002	<0.002	29	0.044	<0.005
1993	<0.10	0.011	<0.001	0.2	<0.001	34	<0.001	<0.002	0.01	<0.001	18	<0.0002	<0.002	29	0.041	0.006
1994	<0.10	0.014	<0.001	0.2	<0.001	36	<0.001	<0.002	<0.01	<0.001	18	<0.0002	<0.002	30	0.050	0.007
1995	<0.10	0.013	<0.001	0.2	<0.001	34	<0.001	0.003	<0.01	<0.002	18	<0.0002	<0.002	31	0.052	0.007
1996	<0.10	0.011	<0.001	<0.1	<0.001	36	0.001	<0.002	<0.01	<0.002	19	<0.0002	<0.002	31	0.046	0.009
1997	<0.10	0.014	<0.001	<0.1	<0.001	34	0.001	<0.002	<0.01	<0.002	18	<0.0002	<0.002	30	0.047	<0.005
1998	<0.10	0.012	<0.001	0.2	<0.001	35	<0.001	<0.002	<0.01	<0.001	19	<0.0002	<0.002	31	0.055	<0.005
1999	<0.10	0.013	<0.001	0.3	<0.001	36	<0.001	<0.002	<0.01	<0.001	19	<0.0002	<0.002	31	0.048	<0.005
2000	<0.10	0.012	<0.001	0.2	<0.001	41	<0.001	<0.002	0.19	<0.001	21	<0.0002	0.002	35	0.053	<0.005
2001	<0.10	0.008	0.001	<0.1	<0.001	37	<0.001	<0.002	0.06	<0.001	20	<0.0002	0.001	40	0.027	<0.005
2002	0.24	0.011	<0.001	0.1	<0.001	43	0.001	0.002	0.28	<0.001	22	<0.0002	<0.001	37	0.056	0.009
2003	<0.10	0.010	<0.001	<0.1	<0.001	37	0.001	0.002	0.01	<0.001	20	<0.0002	0.001	35	0.047	0.006
2004	<0.10	0.013	<0.001	<0.1	<0.001	37	0.001	<0.002	0.01	<0.001	20	<0.0002	<0.001	37	0.053	0.011
2005	<0.10	0.012	<0.001	<1.0	<0.001	35	<0.001	<0.002	0.05	<0.001	19	<0.0002	<0.001	38	0.046	<0.01

Table 10.
PGE Boardman Plant - 2005 Water Quality Report
Well #008 Annual Average Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	Conductivity	pH	Static water level	Water elevation
1981	146	8	0.6	1.1	16	17	221	275	7.6	21.8	641.7
1982	149	8	0.6	1.8	19	19	233	320	7.6	22.3	641.2
1983	152	9	0.6	1.0	24	19	235	350	7.5	20.3	643.2
1984	157	11	0.6	0.6	29	17	237	400	7.4	22.3	641.2
1985	165	12	0.5	0.5	36	18	244	395	7.7	23.4	640.1
1986	166	14	0.6	0.3	37	20	256	421	7.7	24.1	639.4
1987	165	16	0.6	0.2	37	20	263	400	8.0	23.1	640.4
1988	167	19	0.6	<0.1	38	19	263	413	7.3	25.0	638.5
1989	167	17	0.6	0.2	38	18	264	410	7.4	23.5	640
1990	172	19	0.5	0.1	33	19	263	398	7.7	22.5	641
1991	184	17	0.6	<0.1	37	14	264	398	7.7	21.8	641.7
1992	185	16	0.6	<0.1	37	17	271	433	7.8	21.5	642
1993	193	16	0.6	<0.1	37	19	289	460	7.7	21.2	642.3
1994	190	17	0.6	<0.5	30	19	282	451	7.7	22.3	641.2
1995	182	19	0.7	<0.1	36	24	291	413	8.1	21.5	642
1996	184	23	0.7	0.6	40	19	300	476	8.2	21.8	641.7
1997	183	20	0.5	<0.1	44	25	270	450	7.8	21.0	642.5
1998	186	22	0.5	<0.1	48	26	270	448	7.6	20.4	643.1
1999	200	24	0.5	<0.1	46	27	290	482	7.5	19.0	644.5
2000	205	25	0.5	<0.1	43	25	273	466	7.5	19.1	644.4
2001	184	31	0.8	<0.1	46	26	310	505	7.7	18.6	644.9
2002	198	28	0.5	<0.1	43	24	316	536	7.3	19.5	644
2003	192	27	0.6	<0.1	45	20	313	486	8.0	19.2	644.3
2004	199	24	0.6	<0.1	46	18	301	454	8.0	21.3	642.2
2005	197	23	0.6	<0.1	44	20	310	441	7.9	22.8	640.7

Table 11.
PGE Boardman Plant - 2005 Water Quality Report
Well #052 Annual Average Cation/Metals Concentrations (mg/l)

	Aluminum	Arsenic	Beryllium	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Mercury	Selenium	Sodium	Vanadium	Zinc
1981																
1982																
1983																
1984																
1985	<0.1	0.004	<0.001	0.2	<0.001	62	0.0016	0.002	<0.04	<0.002	34	<0.0002	0.007	45	0.043	0.007
1986	<0.1	0.006	<0.001	0.2	<0.001	61	0.0021	0.002	<0.04	<0.002	40	<0.0002	0.005	51	0.046	0.014
1987	<0.1	0.011	<0.001	0.2	<0.001	80	0.0012	0.003	<0.04	<0.002	46	<0.0002	0.006	49	0.045	0.015
1988	<0.1	0.006	<0.001	0.2	<0.001	83	0.0017	0.003	<0.04	<0.002	46	<0.0002	0.008	49	0.050	0.011
1989	<0.1	<0.005	<0.001	0.2	<0.001	78	0.0015	0.003	<0.04	<0.002	46	0.0003	0.008	47	0.039	0.016
1990	<0.1	0.006	<0.001	0.1	<0.001	80	0.0013	0.003	<0.04	<0.002	48	<0.0002	0.006	49	0.038	0.005
1991	<0.1	0.006	<0.001	0.1	<0.001	84	0.0022	0.003	<0.04	<0.002	48	<0.0002	0.007	49	0.062	0.010
1992	<0.1	0.006	<0.001	0.1	<0.001	81	0.0015	0.003	<0.04	<0.002	46	<0.0002	0.005	49	0.058	0.005
1993	<0.1	0.006	<0.001	<0.1	<0.001	80	0.0016	<0.002	<0.01	<0.001	46	<0.0002	0.006	51	0.057	<0.005
1994	<0.1	0.007	<0.001	0.1	<0.001	82	0.0015	<0.002	<0.01	<0.001	46	<0.0002	0.006	50	0.057	0.007
1995	<0.1	0.006	<0.001	0.1	<0.001	80	0.0014	<0.002	<0.01	<0.002	46	<0.0002	0.005	50	0.058	0.006
1996	<0.1	0.006	<0.001	0.2	<0.001	80	0.0030	<0.002	<0.01	<0.002	46	<0.0002	0.004	50	0.060	0.013
1997	<0.1	0.007	<0.001	0.1	<0.001	76	0.0017	<0.002	<0.01	<0.002	43	<0.0002	0.005	46	0.058	0.014
1998	<0.1	0.006	<0.001	0.1	<0.001	72	0.0017	<0.002	<0.01	<0.001	42	<0.0002	0.004	45	0.059	<0.005
1999	<0.1	0.006	<0.001	0.3	<0.001	68	0.0016	<0.002	<0.01	<0.001	40	<0.0002	0.004	42	0.057	<0.005
2000	<0.1	0.008	<0.001	<0.1	<0.001	74	0.0022	<0.002	<0.01	<0.001	43	<0.0002	0.008	45	0.066	<0.005
2001	0.1	0.009	<0.001	<0.1	<0.001	76	0.0029	<0.002	<0.01	<0.001	45	0.0002	0.009	46	0.070	0.006
2002	0.3	0.008	<0.001	<0.1	<0.001	81	0.0024	<0.002	<0.01	<0.001	44	0.0002	0.009	46	0.075	0.010
2003	<0.1	0.007	<0.001	<0.1	<0.001	76	0.0025	<0.002	<0.01	<0.001	46	<0.0002	0.009	45	0.065	0.007
2004	<0.1	0.008	<0.001	<0.1	<0.001	73	0.0022	0.002	0.08	<0.001	44	<0.0002	0.010	45	0.073	0.006
2005	<0.1	0.007	<0.001	<1.0	<0.001	79	0.0023	<0.001	<0.01	<0.001	44	<0.0002	0.008	48	0.059	<0.01

Table 12.
PGE Boardman Plant - 2005 Water Quality Report
Well #052 Annual Average Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	Conductivity	pH	Static water level	Water elevation
1981										69.8	611.1
1982										69.7	611.2
1983										69.9	611
1984										69.5	611.4
1985	128	71	0.7	17.1	40	101	555	870	7.6	51.4	629.5
1986	119	86	0.7	18.5	50	146	638	1000	7.6	48.5	632.4
1987	114	94	0.7	20.0	51	166	675	1175	7.4	46.9	634
1988	119	98	0.7	19.0	53	168	734	1188	7.6	45.4	635.5
1989	118	97	0.7	20.5	49	176	725	1055	7.3	44.5	636.4
1990	119	94	0.7	19.3	40	178	721	1163	7.4	44.2	636.7
1991	129	96	0.8	19.6	37	176	731	1010	7.5	43.4	637.5
1992	122	93	0.7	20.2	46	172	708	889	7.5	42.7	638.2
1993	123	97	0.7	20.3	46	173	639	970	7.4	45.3	635.6
1994	121	99	0.7	24.5	41	178	696	954	7.5	43.0	637.9
1995	125	96	0.9	19.1	47	168	665	977	7.6	42.1	638.8
1996	119	90	0.8	21.0	53	160	560	964	7.3	42.1	638.8
1997	131	94	0.6	19.0	54	170	625	988	7.6	40.3	640.6
1998	130	92	0.5	17.0	66	160	580	927	7.5	40.2	640.7
1999	132	87	0.6	15.5	63	145	605	825	7.2	40.2	640.7
2000	135	94	0.7	17.1	57	149	558	890	7.4	40.1	640.8
2001	124	92	0.9	15.4	61	154	622	896	7.5	39.7	641.2
2002	125	88	0.6	14.2	61	155	650	960	7.1	39.7	641.2
2003	126	91	0.7	13.8	56	158	631	890	7.7	39.6	641.3
2004	134	90	0.7	12.7	62	165	633	865	7.7	39.7	641.2
2005	138	90	0.6	12.4	59	174	659	871	7.6	39.7	641.2

Table 13.
PGE Boardman Plant - 2005 Water Quality Report
Well #053 Annual Average Cation/Metals Concentrations (mg/l)

	Aluminum	Arsenic	Beryllium	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Mercury	Selenium	Sodium	Vanadium	Zinc
1981	<0.1	0.004	<0.001	0.2	<0.001	93	0.0014	0.008	<0.04	<0.005	70	<0.0005	0.010	90	0.032	0.013
1982	<0.1	0.005	<0.001	0.2	<0.001	83	0.0016	0.009	<0.04	<0.005	64	0.0002	0.016	81	0.017	0.011
1983	<0.1	0.005	<0.001	0.2	<0.001	67	0.0013	0.006	<0.04	<0.002	50	<0.0002	0.009	81	0.042	0.009
1984	<0.1	0.004	<0.001	0.2	<0.001	61	0.0013	0.006	<0.04	<0.002	46	<0.0002	<0.005	84	0.037	0.006
1985	<0.1	0.005	<0.001	0.2	<0.001	58	0.0007	0.008	0.07	<0.002	45	<0.0002	0.009	87	0.039	0.008
1986	<0.1	0.003	<0.001	0.3	<0.001	54	0.0022	0.004	<0.04	<0.002	42	<0.0002	<0.005	85	0.047	0.010
1987	<0.1	0.010	<0.001	0.2	<0.001	58	0.0009	0.008	<0.04	<0.002	43	<0.0002	0.008	86	0.042	0.004
1988	<0.1	<0.005	<0.001	0.2	<0.001	59	0.0005	0.006	<0.04	<0.002	46	<0.0002	0.011	90	0.048	0.015
1989	<0.1	0.006	<0.001	0.2	<0.001	68	0.0005	0.005	<0.04	<0.002	49	0.0005	0.009	78	0.040	0.015
1990	<0.1	0.007	<0.001	0.2	<0.001	65	<0.0005	0.004	<0.04	<0.002	49	<0.0002	0.005	80	0.038	0.013
1991	<0.1	0.006	<0.001	0.2	<0.001	65	0.0018	0.004	0.01	0.003	49	<0.0002	<0.005	83	0.060	0.005
1992	<0.1	0.004	<0.001	0.1	<0.001	62	<0.0002	0.004	<0.04	<0.002	46	<0.0002	0.003	79	0.049	0.007
1993	<0.1	0.003	<0.001	0.1	<0.001	59	0.0012	0.003	<0.01	<0.001	45	<0.0002	0.003	80	0.036	<0.005
1994	<0.1	0.004	<0.001	0.1	<0.001	59	<0.0002	<0.002	<0.01	<0.001	44	<0.0002	0.006	82	0.044	0.007
1995	<0.1	0.003	<0.001	0.1	<0.001	59	0.0005	<0.002	<0.01	<0.002	44	<0.0002	<0.002	81	0.007	0.009
1996	<0.1	0.002	<0.001	0.2	<0.001	60	<0.0005	<0.002	<0.01	<0.002	45	<0.0002	<0.002	80	<0.005	0.011
1997	<0.1	0.005	<0.001	0.3	<0.001	57	0.0013	<0.002	<0.01	<0.002	44	<0.0002	0.003	73	0.049	0.008
1998	<0.1	0.007	<0.001	0.1	<0.001	54	0.0006	<0.002	<0.01	<0.001	41	<0.0002	0.003	67	0.077	<0.005
1999	<0.1	0.008	<0.001	0.2	<0.001	51	<0.0005	<0.002	<0.01	<0.001	39	<0.0002	0.004	64	0.090	0.010
2000	<0.1	0.010	<0.001	0.1	<0.001	56	0.0018	<0.002	<0.01	<0.001	42	<0.0002	0.009	69	0.106	<0.005
2001	0.1	0.011	<0.001	<0.1	<0.001	57	0.0016	0.001	<0.02	<0.001	45	<0.0002	0.006	75	0.116	0.004
2002	0.2	0.010	<0.001	<0.1	<0.001	60	0.0013	0.002	<0.02	<0.001	44	<0.0002	0.005	66	0.121	0.015
2003	<0.1	0.008	<0.001	<0.1	<0.001	55	0.0012	<0.002	<0.01	<0.001	42	<0.0002	0.005	68	0.107	0.007
2004	<0.1	0.008	<0.001	<0.1	<0.001	57	0.0018	0.002	0.04	<0.001	48	<0.0002	0.009	63	0.103	0.005
2005	<0.1	0.009	<0.001	<1.0	<0.001	57	<0.001	<0.001	<0.01	<0.001	43	<0.0002	0.004	70	0.101	<0.01

Table 14.
PGE Boardman Plant - 2005 Water Quality Report
Well #053 Annual Average Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	Conductivity	pH	Static water level	Water elevation
1981	206	157	0.6	21.1	33	234	952	1310	7.6	27.3	666.1
1982	221	122	0.7	17.9	20	215	811	1288	8.0	26.8	666.6
1983	228	101	0.9	13.0	39	180	737	1018	7.6	25.2	668.2
1984	231	78	0.8	9.6	28	151	680	1185	7.4	25.8	667.6
1985	234	69	0.8	8.0	39	142	653	1400	8.1	28.7	664.7
1986	230	72	0.8	6.4	51	136	650	1013	7.9	30.3	663.1
1987	227	86	0.8	6.6	49	138	670	1150	7.9	30.2	663.2
1988	236	80	0.8	6.3	49	137	696	1208	7.7	31.5	661.9
1989	240	83	0.8	10.1	51	155	711	1125	7.6	31.3	662.1
1990	253	83	0.8	7.6	42	140	703	1188	7.5	30.9	662.5
1991	283	77	0.9	4.1	43	137	674	1063	7.4	28.8	664.6
1992	303	68	0.8	1.9	47	122	648	989	7.5	30.5	662.9
1993	306	71	0.8	0.7	47	118	668	931	7.5	29.5	663.9
1994	299	63	0.8	0.7	42	107	624	926	7.3	30.9	662.5
1995	324	64	0.9	<0.1	45	98	610	953	8.2	32.0	661.4
1996	329	57	1.0	3.3	51	88	610	950	7.4	31.1	662.3
1997	326	59	0.8	6.9	58	92	598	947	7.5	29.6	663.8
1998	288	55	0.7	5.1	74	93	545	893	7.5	30.0	663.4
1999	300	54	0.7	5.7	73	87	550	858	7.8	29.9	663.5
2000	310	56	0.9	5.4	68	81	552	827	7.7	30.0	663.4
2001	287	54	1.0	5.0	73	78	572	866	7.6	29.4	664.0
2002	296	49	0.8	4.7	68	76	565	915	7.2	29.6	663.8
2003	301	52	0.9	4.4	73	76	580	846	7.5	29.5	663.9
2004	319	50	0.9	4.7	74	72	576	834	7.9	29.3	664.1
2005	334	49	0.8	4.2	72	69	578	846	7.6	28.9	664.5

Table 15.
PGE Boardman Plant - 2005 Water Quality Report
Well #120 Annual Average Cation/Metals Concentrations (mg/l)

	Aluminum	Arsenic	Beryllium	Boron	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Mercury	Selenium	Sodium	Vanadium	Zinc
1981																
1982																
1983																
1984																
1985																
1986																
1987	<0.1	0.007	<0.0001	0.3	<0.001	99	0.0006	0.018	<0.04	<0.002	45	<0.0002	0.012	73	0.024	0.007
1988	<0.1	<0.005	<0.0001	0.2	<0.001	96	0.0009	0.008	<0.04	<0.002	47	<0.0002	0.013	72	0.036	0.009
1989	<0.1	<0.005	<0.0001	0.2	<0.001	104	0.0008	0.002	<0.04	<0.002	58	<0.0002	0.019	69	0.035	0.009
1990	<0.1	<0.005	<0.0001	0.2	<0.001	112	0.0007	0.003	<0.04	<0.002	72	<0.0002	0.018	74	0.036	0.005
1991	<0.1	0.005	<0.001	0.2	<0.001	116	0.0023	0.002	<0.04	<0.002	72	<0.0002	0.013	75	0.069	0.004
1992	<0.1	0.006	<0.001	0.2	<0.001	109	0.0009	<0.002	<0.04	<0.002	68	<0.0002	0.010	73	0.059	0.009
1993	<0.1	0.005	<0.001	0.1	<0.001	107	0.0010	<0.002	<0.01	<0.001	65	<0.0002	0.013	73	0.057	0.007
1994	<0.1	0.005	<0.001	0.2	<0.001	109	0.0012	<0.002	<0.01	<0.001	66	<0.0002	0.012	71	0.061	0.006
1995	<0.1	0.005	<0.001	0.2	<0.001	107	0.0010	0.003	<0.01	<0.002	66	<0.0002	0.010	71	0.061	0.023
1996	<0.1	0.004	<0.001	0.2	<0.001	102	0.0028	<0.002	<0.01	<0.002	63	<0.0002	0.008	69	0.064	0.007
1997	<0.1	0.005	<0.001	0.1	<0.001	93	0.0011	<0.002	<0.01	<0.002	58	<0.0002	0.008	62	0.065	0.008
1998	<0.1	0.005	<0.001	0.2	<0.001	86	<0.0005	<0.002	<0.01	<0.001	54	<0.0002	0.006	61	0.066	<0.005
1999	<0.1	0.005	<0.001	0.2	<0.001	80	<0.0005	<0.002	<0.01	<0.001	50	<0.0002	0.008	59	0.065	<0.005
2000	<0.1	0.007	<0.001	0.1	<0.001	86	0.0009	<0.002	<0.01	<0.001	54	<0.0002	0.008	63	0.077	<0.005
2001	0.2	0.009	<0.001	<0.1	<0.001	87	0.0015	<0.002	<0.02	<0.001	50	<0.0002	0.014	71	0.079	0.006
2002	0.3	0.007	<0.001	<0.1	<0.001	94	0.0013	<0.002	<0.02	<0.001	55	<0.0002	0.013	71	0.088	0.009
2003	<0.1	0.006	<0.001	<0.1	<0.001	77	0.0012	<0.002	<0.01	<0.001	53	<0.0002	0.012	59	0.076	0.005
2004	<0.1	0.007	<0.001	<0.1	<0.001	84	0.0017	<0.002	0.01	<0.001	53	<0.0002	0.015	60	0.086	0.006
2005	<0.1	0.006	<0.001	<1.0	<0.001	90	<0.001	<0.001	<0.01	<0.001	53	<0.0002	0.010	64	0.072	<0.01

Table 16.
PGE Boardman Plant - 2005 Water Quality Report
Well #120 Annual Average Anion Concentrations (mg/l) + Other Parameters

	Bicarb.Alk.	Chloride	Fluoride	Nitrate	Silica	Sulfate	TDS	Conductivity	pH	Static water level	Water elevation
1981										Dry	NA
1982										Dry	NA
1983										Dry	NA
1984										Dry	NA
1985										Dry	NA
1986										Dry	NA
1987	117	122	0.4	51.0	42	116	802	1250	7.9	53.5	648.3
1988	124	119	0.5	44.0	49	105	841	1313	7.5	51.8	650
1989	152	142	0.5	66.0	47	125	956	1475	7.2	50.5	651.3
1990	128	197	0.5	63.0	42	130	1019	1463	7.3	50	651.8
1991	142	173	0.6	66.2	41	142	1073	1500	7.5	49.4	652.4
1992	139	159	0.5	61.4	44	142	997	1438	7.7	49.3	652.5
1993	144	168	0.5	56.3	47	158	946	1379	7.4	48.6	653.2
1994	145	160	0.5	48.5	43	145	917	1386	7.4	49.5	652.3
1995	147	163	0.8	49.9	50	150	945	1352	7.6	48.9	652.9
1996	138	150	0.7	44.5	56	145	950	1422	7.5	48.5	653.3
1997	178	140	0.5	36.5	58	160	915	1250	8.0	46.4	655.4
1998	160	130	0.5	32.0	71	160	725	1158	7.4	46	655.8
1999	169	120	0.5	26.0	66	145	730	1068	7.7	45.9	655.9
2000	171	125	0.5	25.1	61	165	741	1058	7.4	45.7	656.1
2001	158	122	0.6	25.0	66	165	756	1120	7.5	45.5	656.3
2002	160	114	0.6	23.2	60	165	733	1170	7.0	45.3	656.5
2003	158	117	0.6	22.9	67	165	776	1065	7.4	45.2	656.6
2004	167	114	0.7	22.3	67	171	762	1050	7.8	45.2	656.6
2005	170	112	0.6	21.9	66	180	778	1045	7.5	45.2	656.6

Figure 1.
PGE - Boardman Plant
Carty Reservoir Annual Average Concentration (mg/l) of Major Ions

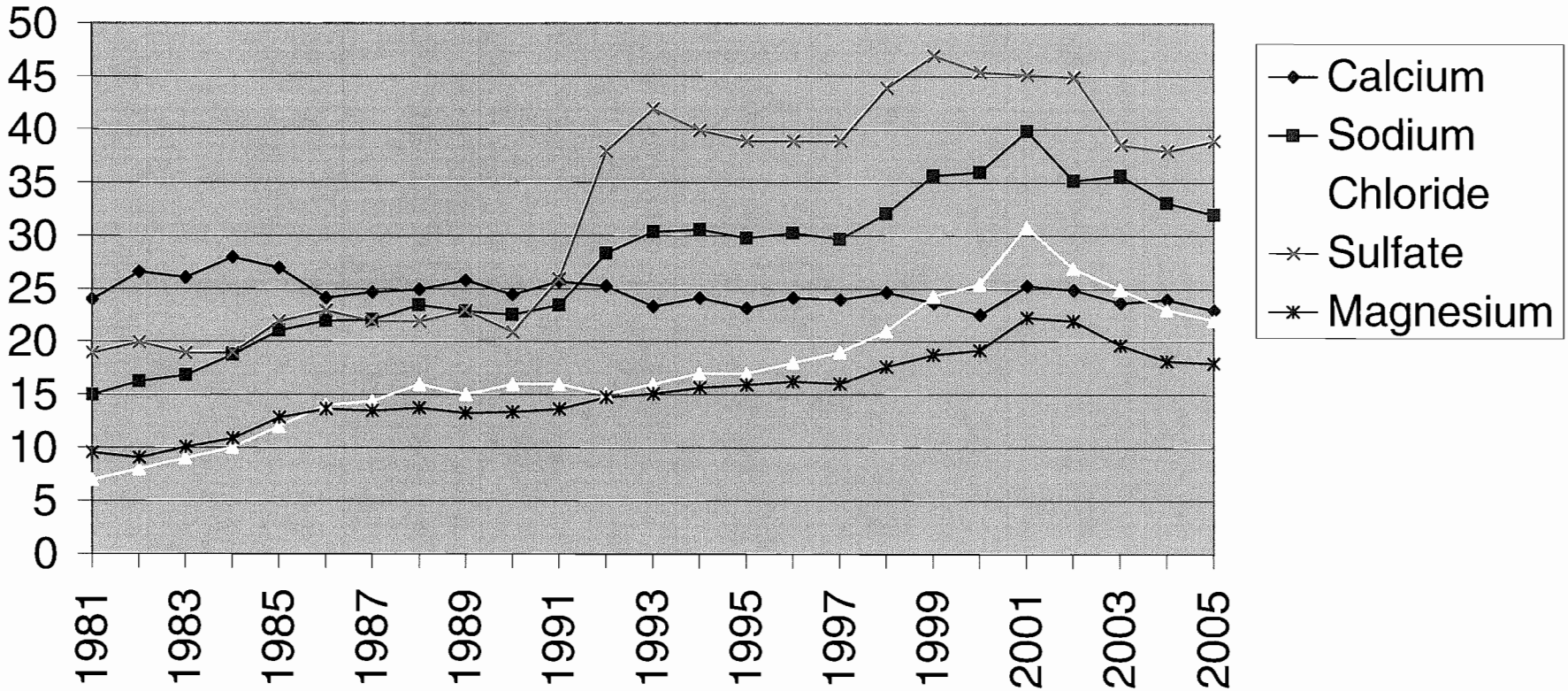


Figure 2.
PGE - Boardman Plant
Alkalinity (mg/l)

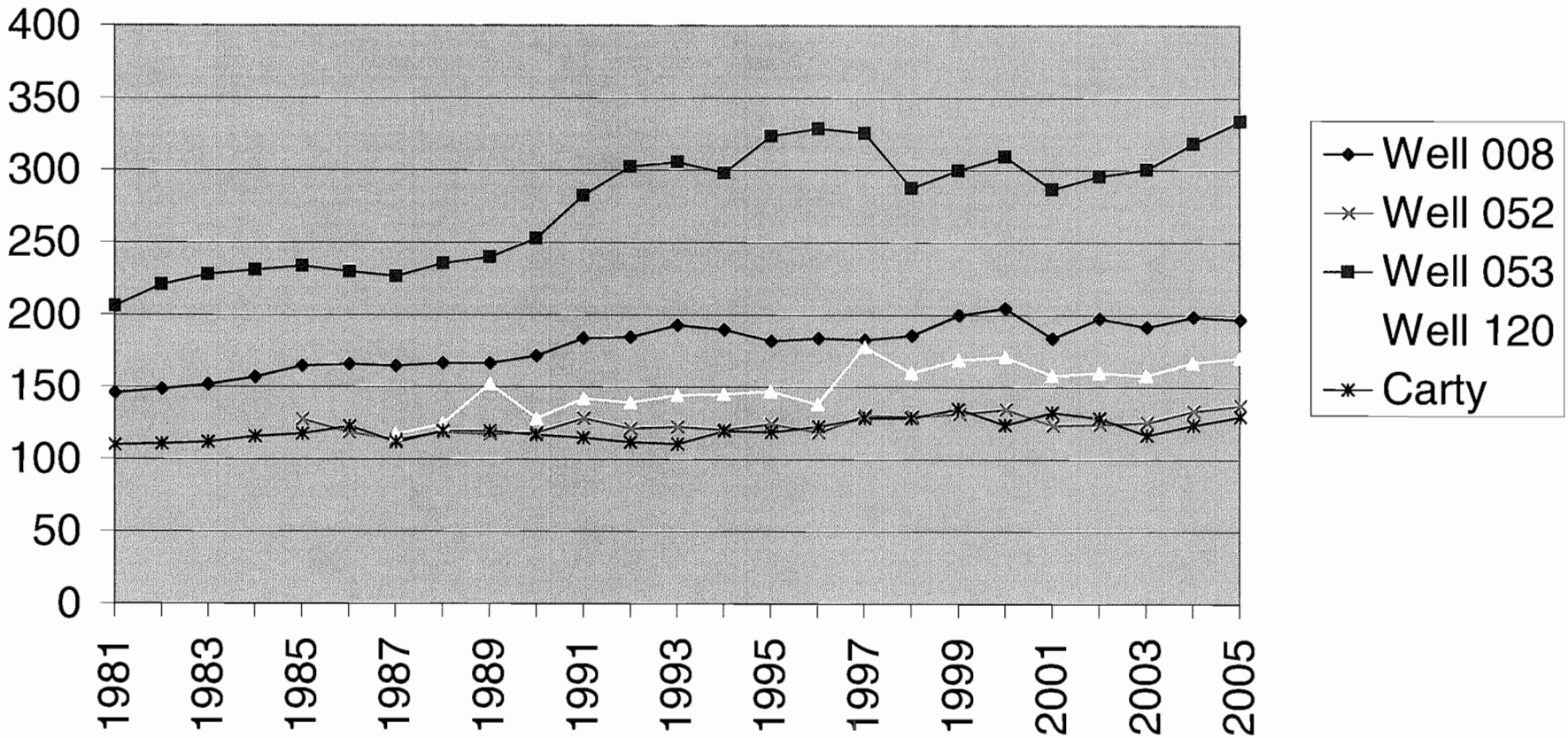


Figure 3.
PGE - Boardman Plant
Chloride (mg/l)

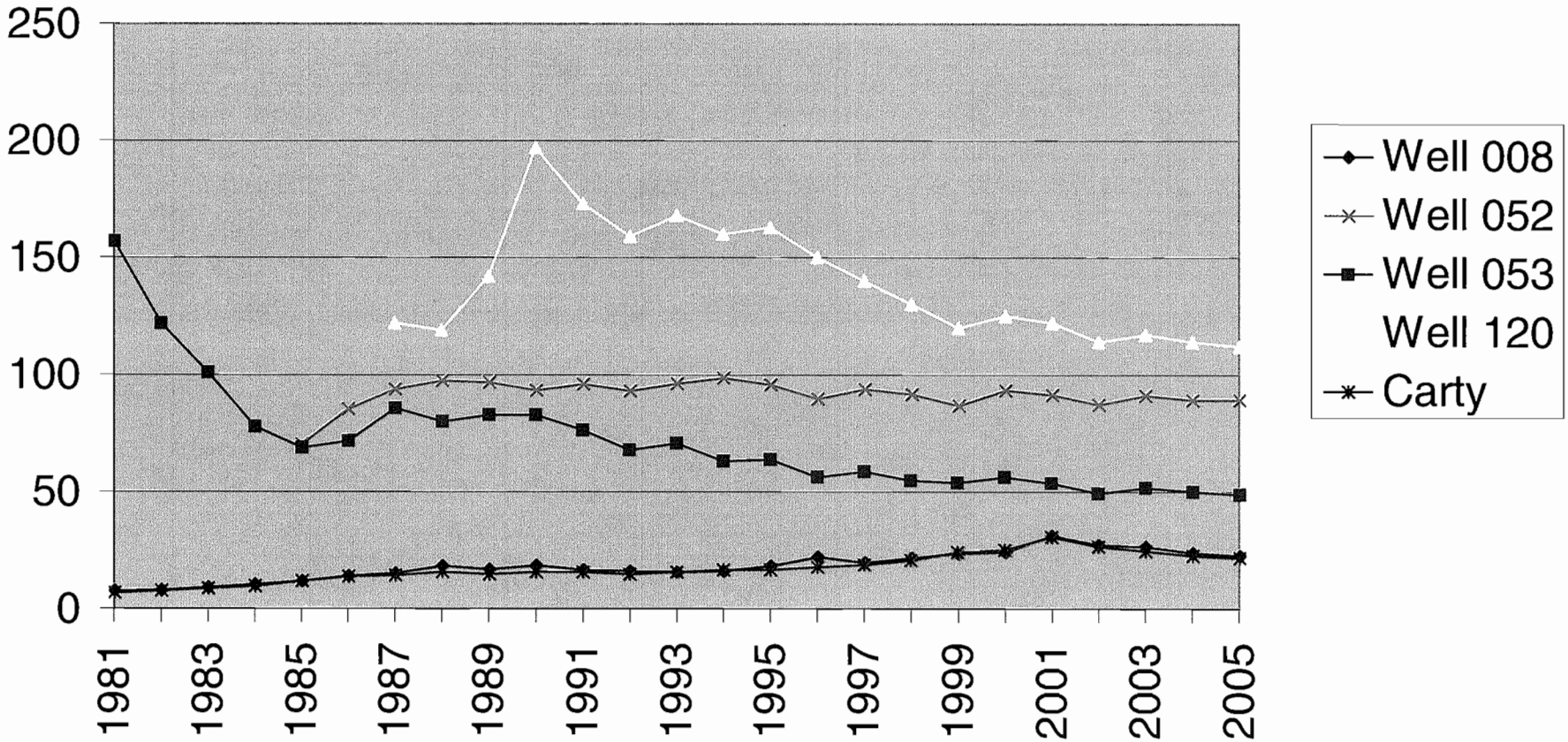


Figure 4.
PGE - Boardman Plant
Nitrate (mg/l)

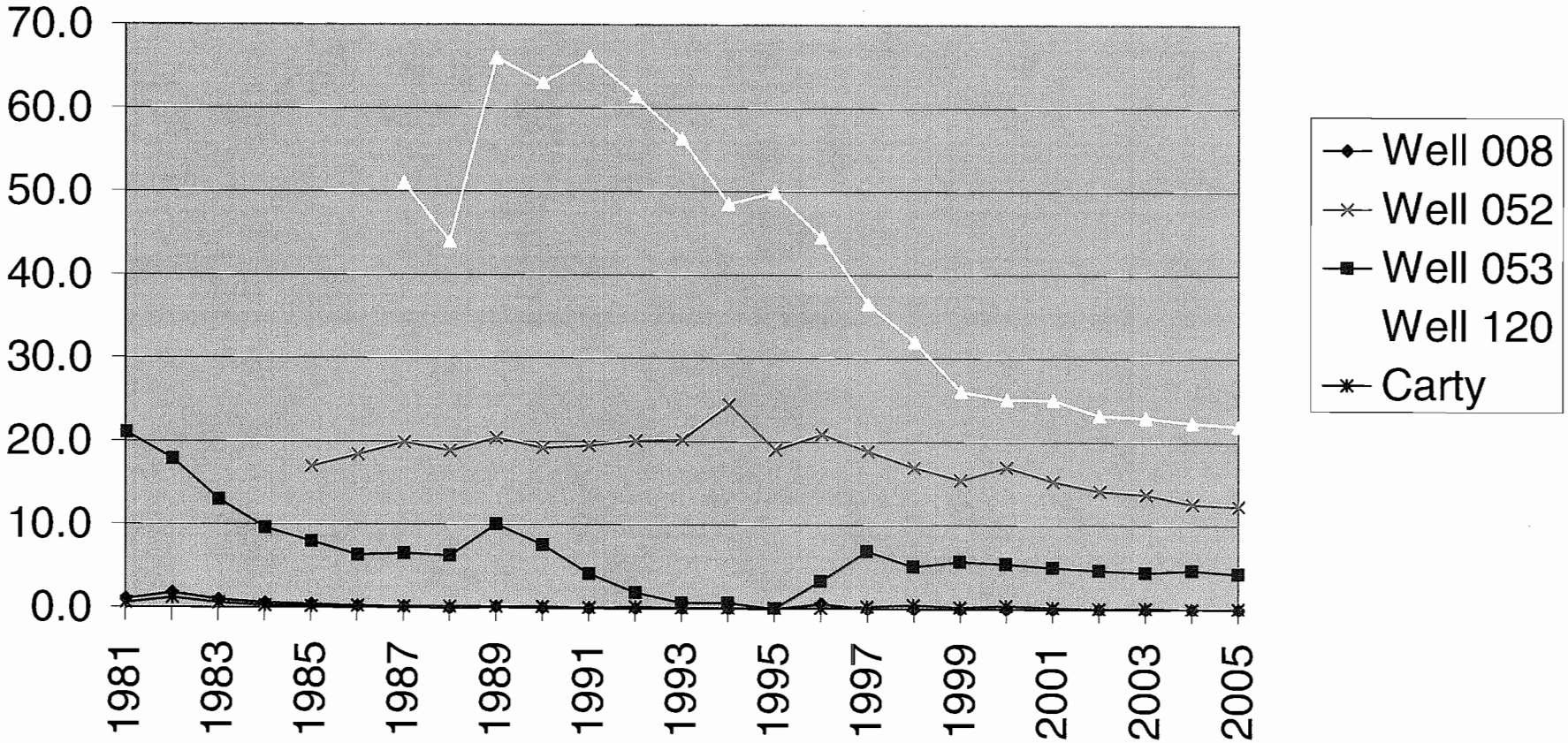


Figure 5.
PGE - Boardman Plant
Sulfate (mg/l)

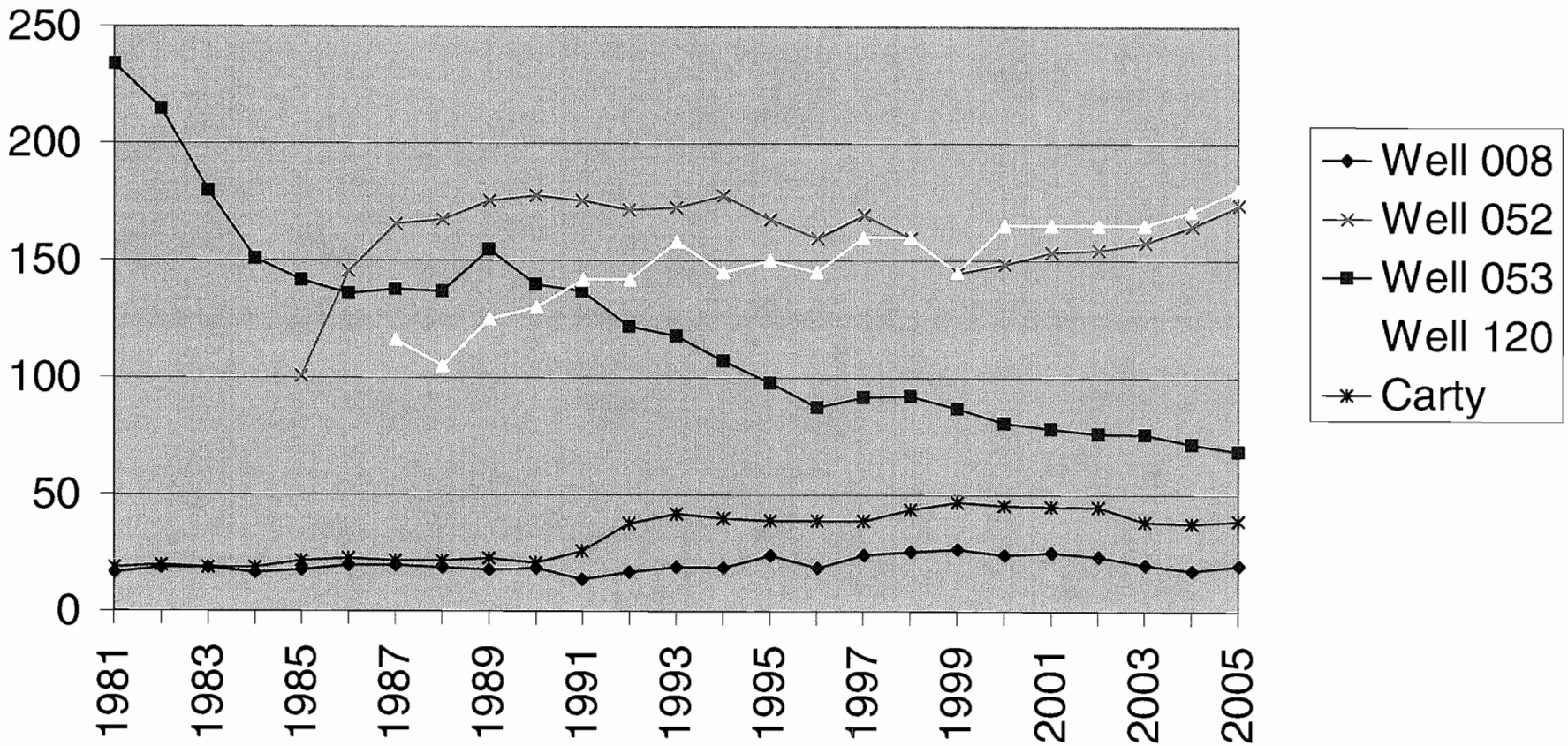


Figure 6.
PGE - Boardman Plant
Calcium (mg/l)

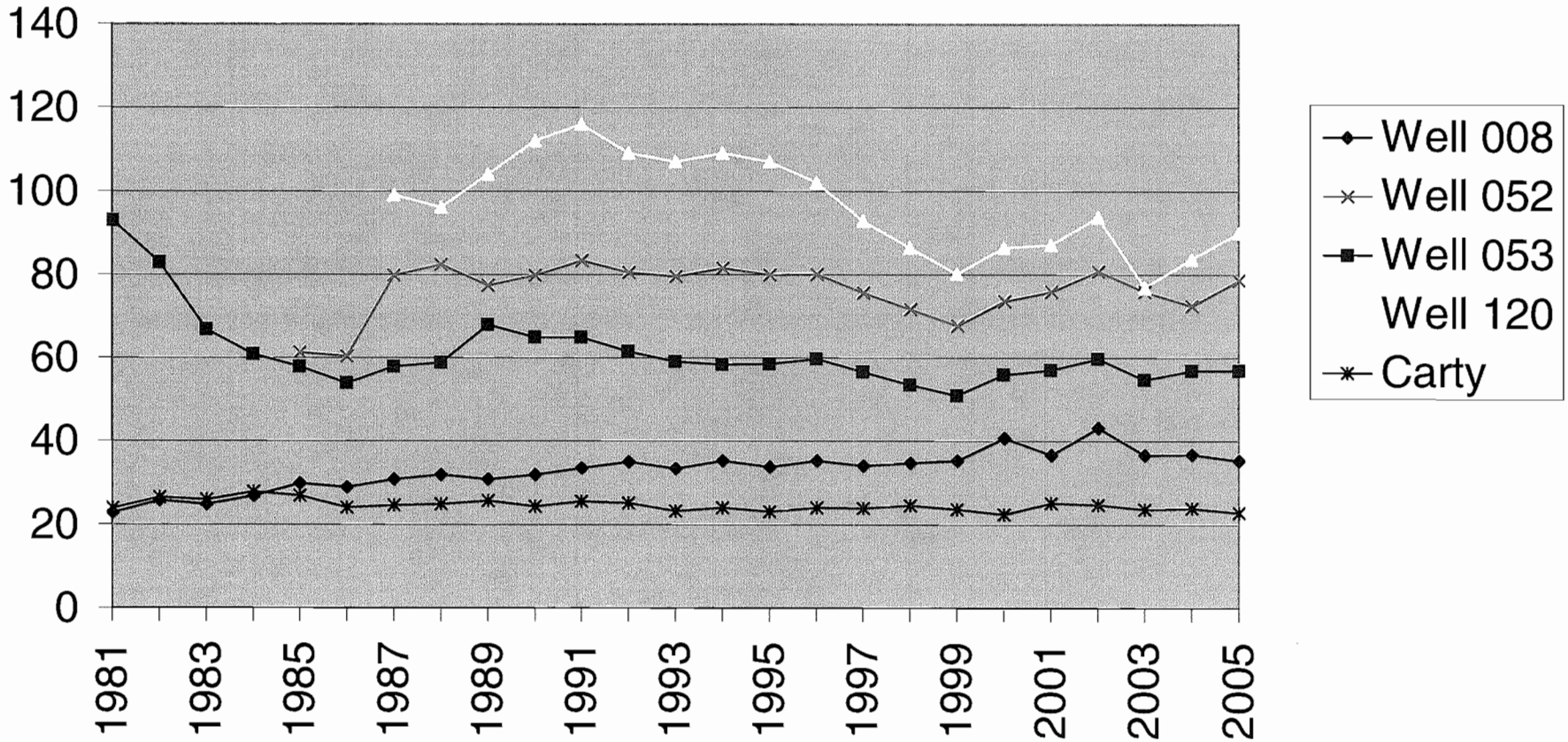


Figure 7.
PGE - Boardman Plant
Magnesium (mg/l)

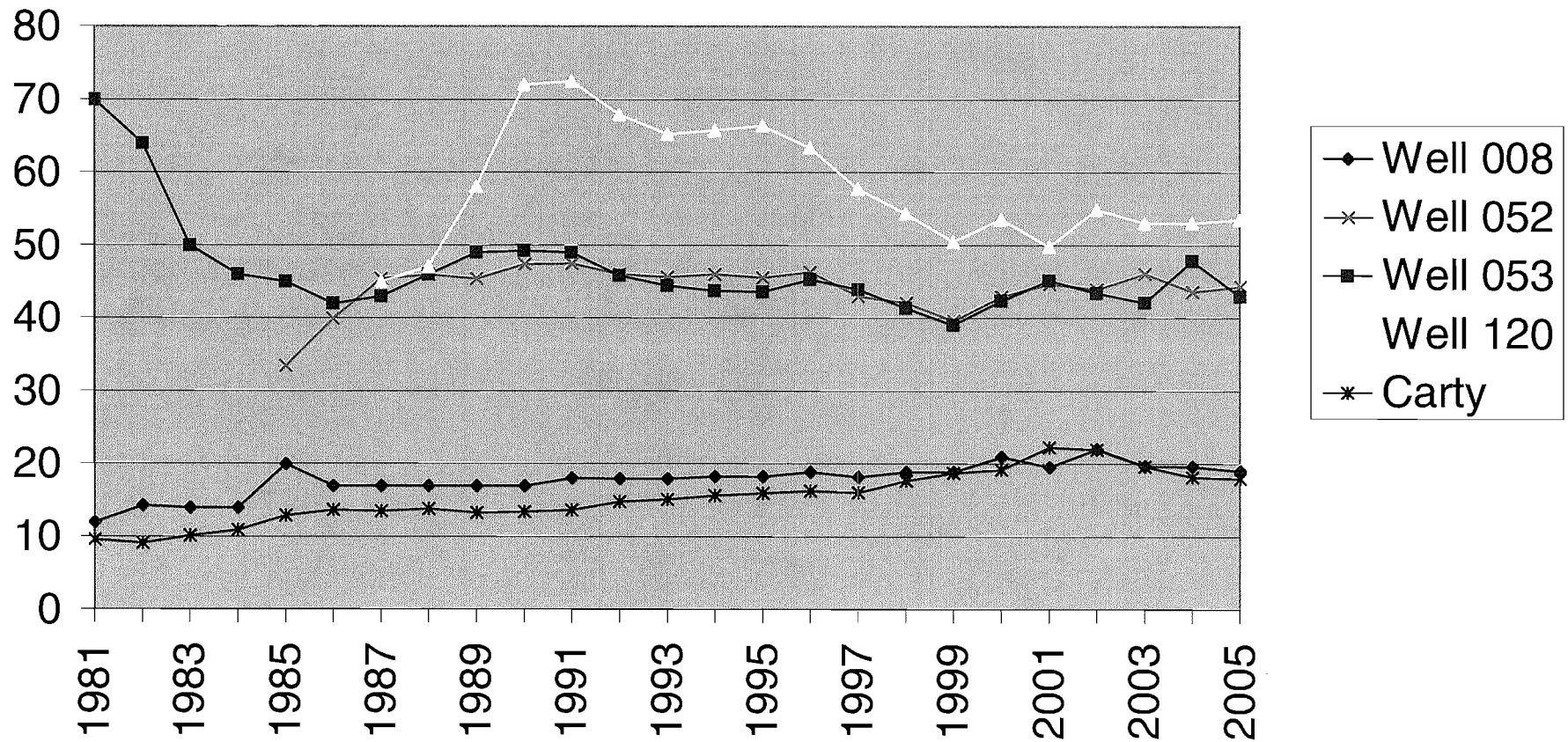


Figure 8.
PGE - Boardman Plant
Sodium (mg/l)

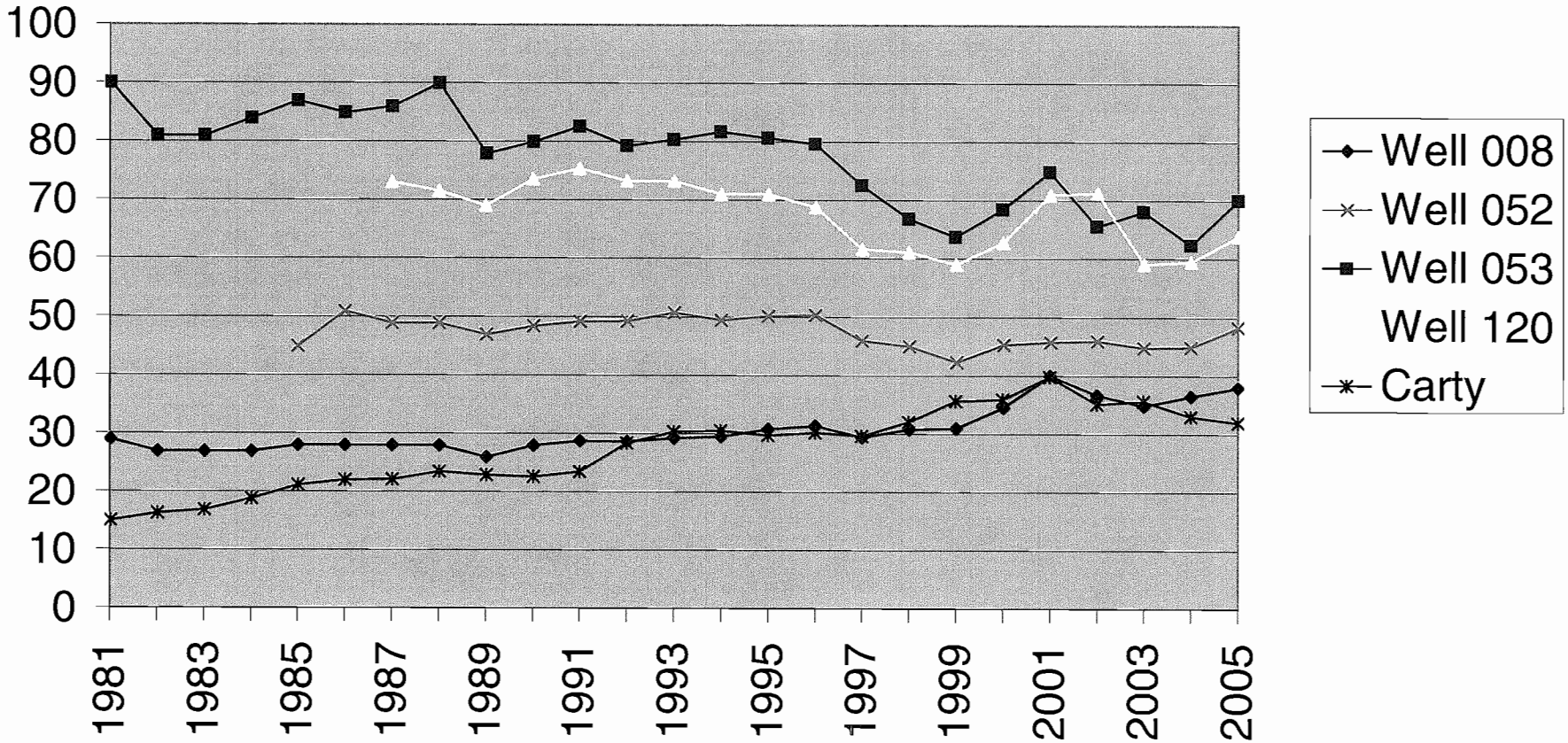
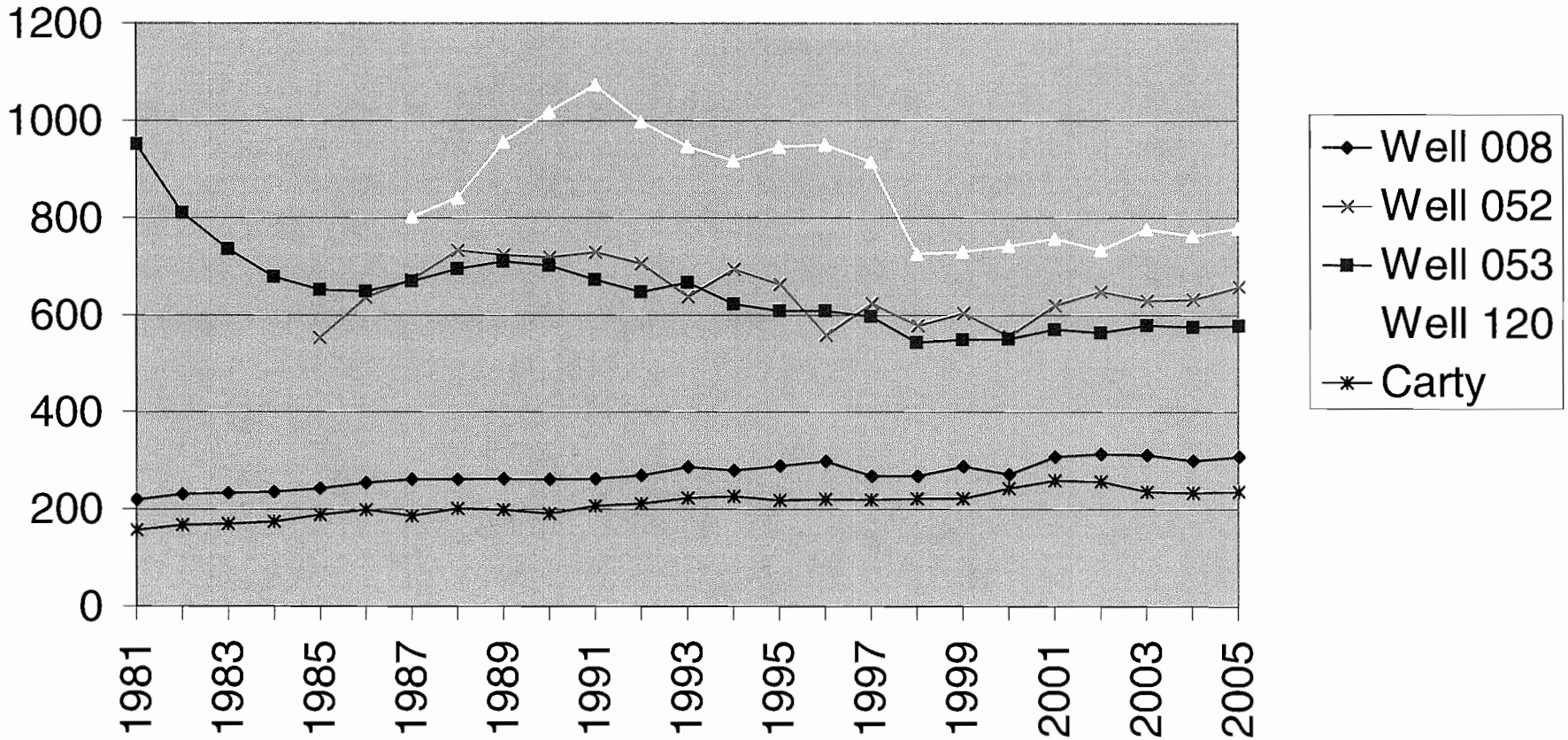


Figure 9.
PGE - Boardman Plant
Total Dissolved Solids (mg/l)



Landon, Dale

From: Nelson, Michael D NWS [Michael.D.Nelson@nws02.usace.army.mil]
Sent: Wednesday, July 26, 2006 2:11 PM
To: Landon, Dale
Subject: FW: Boardman demolition shapefile
Attachments: UXO_bca.shx; UXO_bca.shp; UXO_bca.sbx; UXO_bca.sbn; UXO_bca.prj; UXO_bca.dbf; Ordinance_bca2.shx; Ordinance_bca2.shp; Ordinance_bca2.sbx; Ordinance_bca2.sbn; Ordinance_bca2.prj; Ordinance_bca2.dbf

Dale,

Leslie sent the attached information for the demolition areas. I will have to get one of my IM folks to open and print for me. You probably have the magic touch to open.

Mike

From: Leslie Nelson [mailto:lnelson@tnc.org]
Sent: Friday, July 21, 2006 12:27 PM
To: Nelson, Michael D NWS
Subject: Boardman demolition shapefile

Hi Mike,
It was good to meet you yesterday at Boardman. Always good to have a face to go with a name and voice.

I've attached the shapefiles (and associated data files, etc.) for the demolition craters and the possible UXO that have been identified in demolition area 2 on the Boardman Conservation Area. They are projected in Nad 27, zone 11. Let me know if you have any questions or problems.

Leslie Nelson
Columbia Basin Stewardship Coordinator
The Nature Conservancy
PO Box 314
The Dalles, OR 97058
Ph/fax 541-298-1802
Cell 541-980-3633

Landon, Dale

From: Nelson, Michael D NWS [Michael.D.Nelson@nws02.usace.army.mil]
Sent: Thursday, September 14, 2006 11:47 AM
To: Landon, Dale
Subject: FW: Boardman Air Force Bombing Range FUDS MMRP-SI TPP andPublic Meetings

Dale,

The following are the coordinates I got from Steve Hanson after the TPP Meeting in July

Mike

-----Original Message-----
From: Steven Anderson [mailto:Steven.Anderson@pgn.com]
Sent: Monday, July 31, 2006 3:11 PM
To: Nelson, Michael D NWS
Subject: Re: Boardman Air Force Bombing Range FUDS MMRP-SI TPP andPublic Meetings

Mike, I finally had a chance to get the coordinates for the two bombs we had deactivated earlier this year. Coordinates are based on NAD27 map datum.

1) This was a small dummy practice bomb at 45 deg 43.116 min N, 119 deg 47.004 min W

2) This was a larger practice bomb at 45 deg 42.523 N, 119 deg 47.008 min W

Steve Anderson - Environmental Specialist Portland General Electric P.O. Box 499 Boardman, OR 97818 ph# (541) 481-1233 fax# (541) 481-1209 steven.anderson@ pgn.com

Screening-Level Ecological Risk Assessment
Former Boardman Air Force Range, Oregon

A Screening-Level Ecological Risk Assessment **(**SLERA) was performed for the former Boardman AFR FUDS located in Morrow County, Oregon. First, the current and reasonable future habitat at the FUDS was evaluated to determine if any ecological receptors are likely to be present and if there are any complete exposure pathways. Current and expected future land use within the area of former Boardman AFR includes farming, grazing, and resource management land uses.

The former Boardman AFR is located within the Middle Columbia-Lake Wallula Watershed. The FUDS is currently used for irrigated agricultural and grazing purposes; farming of potatoes, onions, and other vegetables; as a restricted antennae test range operated by the Boeing Company; as a fossil fuel power generating plant owned by PGE; as a habitat management area for the protection of the Washington Ground Squirrel managed by The Nature Conservancy; and as an airstrip operated and maintained by the Morrow County Port Authority.

The native vegetation of the former Boardman AFR is shrub-steppe, with wild grasses and small brush including sage and grey rabbit bush. Therefore, adequate habitat appears to be present at the FUDS.

As chemicals of potential ecological concern (COPECs) were detected in soil, sediment, and surface water, and adequate habitat exists, complete exposure pathways are present. Therefore, as ecological receptors are likely present at the FUDS and there are complete exposure pathways, further SLERA evaluation is necessary. It should be noted that no air samples were collected.

According to the SLERA Guidance for FUDS MMRP Site Inspections (USACE, 2006), only sites that are considered to be Important Ecological Places or are to be managed for ecological purposes, actually require a SLERA. As shown in Table 2-2 of the report text, the FUDS does meet several of the 33 criteria for designation as an Important Ecological Place. An exception to this is Target No. 2 which is used entirely for agricultural purposes and does not fit the definition of an IEP. Portions of the ranges and other areas of interest at the former Boardman AFR are used for agricultural and industrial purposes as well as a wildlife management area for the protection of the Washington Ground Squirrel by The Nature Conservancy under a multi-species candidate conservation agreement. The Washington Ground squirrel is a state listed endangered species and a federal candidate species.

In addition, portions of the former Boardman AFR are within the Three-Mile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances area created by the U.S. Fish and Wildlife Service in cooperation with the Oregon Department of Fish and Wildlife, The Nature Conservancy, and PGE. The agreement contains a strategy for managing lands used by the Washington Ground Squirrel and to preclude the need to federally list the species as threatened or endangered. These lands are managed by The Nature Conservancy.

For purposes of this SLERA, the FUDS has been segregated into six AOCs:

1. Target No. 1
2. Target No. 2
3. Carty Reservoir Bomb Target
4. Range Complex No. 1, including INPR Site No. 1, Demolition Area, and Turret Gunnery Training Range

5. Demolition Area No. 2
6. Impact Area

As discussed in text sections 4.4.1, 5.4.1, 6.4.1, 7.4.1, 8.4.1, and 9.4.1 for these six AOCs, respectively, no detected COPEC concentrations in soil or sediment exceed available site-specific background concentrations. Therefore, no further ecological evaluations, except as provided below, are necessary.

Perchlorate was detected in some surface water samples (at a maximum concentration of 7.49 ug/L [0.00749 mg/L] upstream of Target No. 2), however, all detected concentrations were below available ecological levels of concern, including screening values of 35 mg/L (Los Alamos National Laboratory (LANL; 2005) and 9.3 mg/L (Dean et al., 2004).

Additional Ecological Issues

There is a potential concern for large lead particles, or lead shot, to be present at some of the AOCs, and therefore adversely impact certain species of birds that intentionally ingest grit to add their digestion. As soil samples were sieved prior to chemical analysis, there is the possibility that lead shot was excluded from the analysis. To evaluate this avian concern for potential lead shot toxicity, the following two questions are posed for the FUDS:

1. Are gallinaceous birds (grouse, pheasants, turkeys, partridges, domestic fowls, etc) present, or likely to be present on FUDS?
2. Are lead particles likely to be present in preferred grit sizes for a range of representative gallinaceous birds at the FUDS, for example, for quail with a preferred grit size of 0.8 – 2.2 mm diameter or turkey with a preferred grit size of 2.8 – 4.2 mm diameter (Gionfriddo and Best, 1991)?

For question No. 1, it is possible that gallinaceous birds might be present on the FUDS, based on the presence of terrestrial habitat for some of these types of birds.

For question No. 2, close visual examination during soil collection did not determine evidence of lead fragments and lead shot at the FUDS (Landon, 2007).

As at least one of these questions can be answered in the negative, no further action for the FUDS, related to lead fragments or lead shot and potential terrestrial bird toxicity, is recommended.

SLERA Conclusions

Further action for ecological concerns is not recommended for any of the six AOCs due to COPECs in soil, sediment, or surface water because constituent concentrations were not above site-specific background in soil and sediment or above perchlorate ecological screening levels in surface water.

References:

Gionfriddo and Best, 1991, “Characterization of Grit Use by Cornfield Birds,” Wilson Bulletin, 103(1) pp. 68-82.

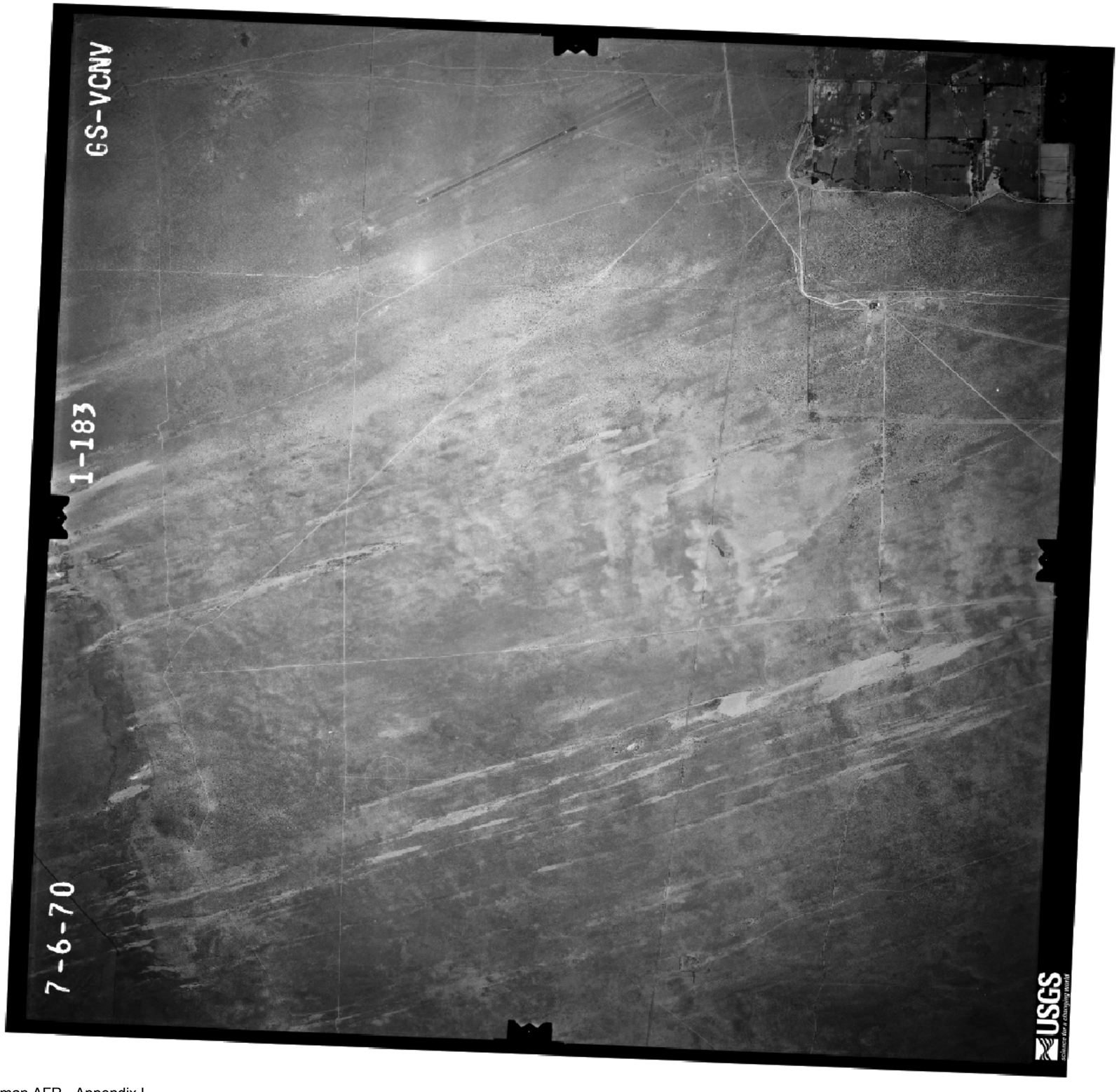
Dean et al., 2004, *Development of Freshwater Water Quality Criteria for Perchlorate*, Environmental Toxicology and Chemistry 23 (6): 1441-1451.

Landon, D., 2007, personal communication between Mr. Dale Landon – Shaw E&I Team Leader and Mr. Mark Weisberg – Shaw E&I Risk Assessment Specialist, September 20.

Los Alamos National Laboratory (LANL), 2005, EcoRisk Database, Release 2.2, September.

OFFICE	DRAWN BY	
CEN	M. Mireiter	5/9/07

DRAWING NUMBER: BoardmanAFR_081_AppendixL_1_SI



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated July 6, 1970.

N

0 1,250 2,500 5,000
Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

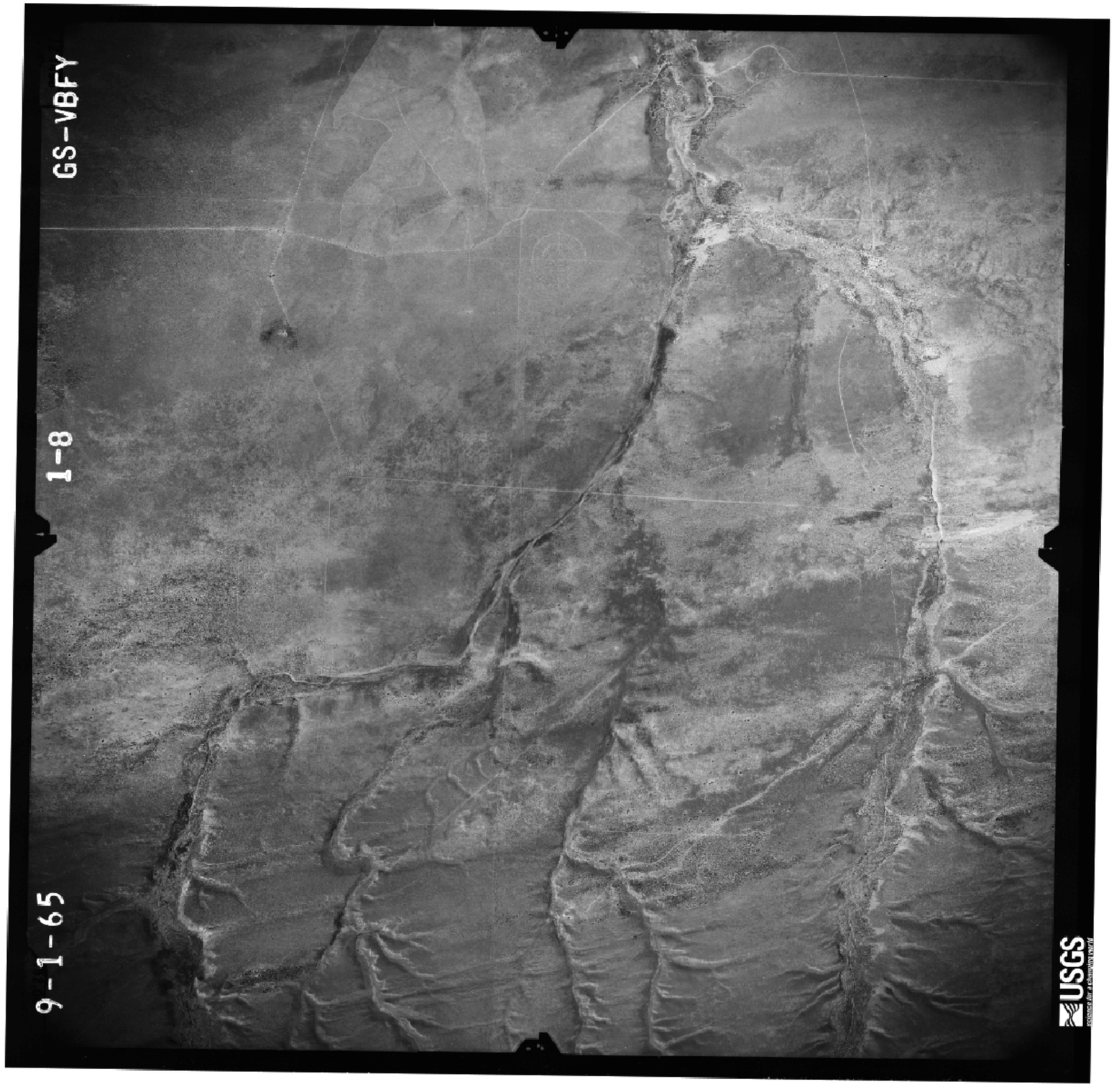
FIGURE L-1

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

Shaw Environmental, Inc.

OFFICE	DRAWN BY	DRAWING NUMBER
CEN	M. Mireiter 5/9/07	BoardmanAFR_082_AppendixL_2_SI



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated September 1, 1965.

N

0 1,000 2,000 4,000
Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

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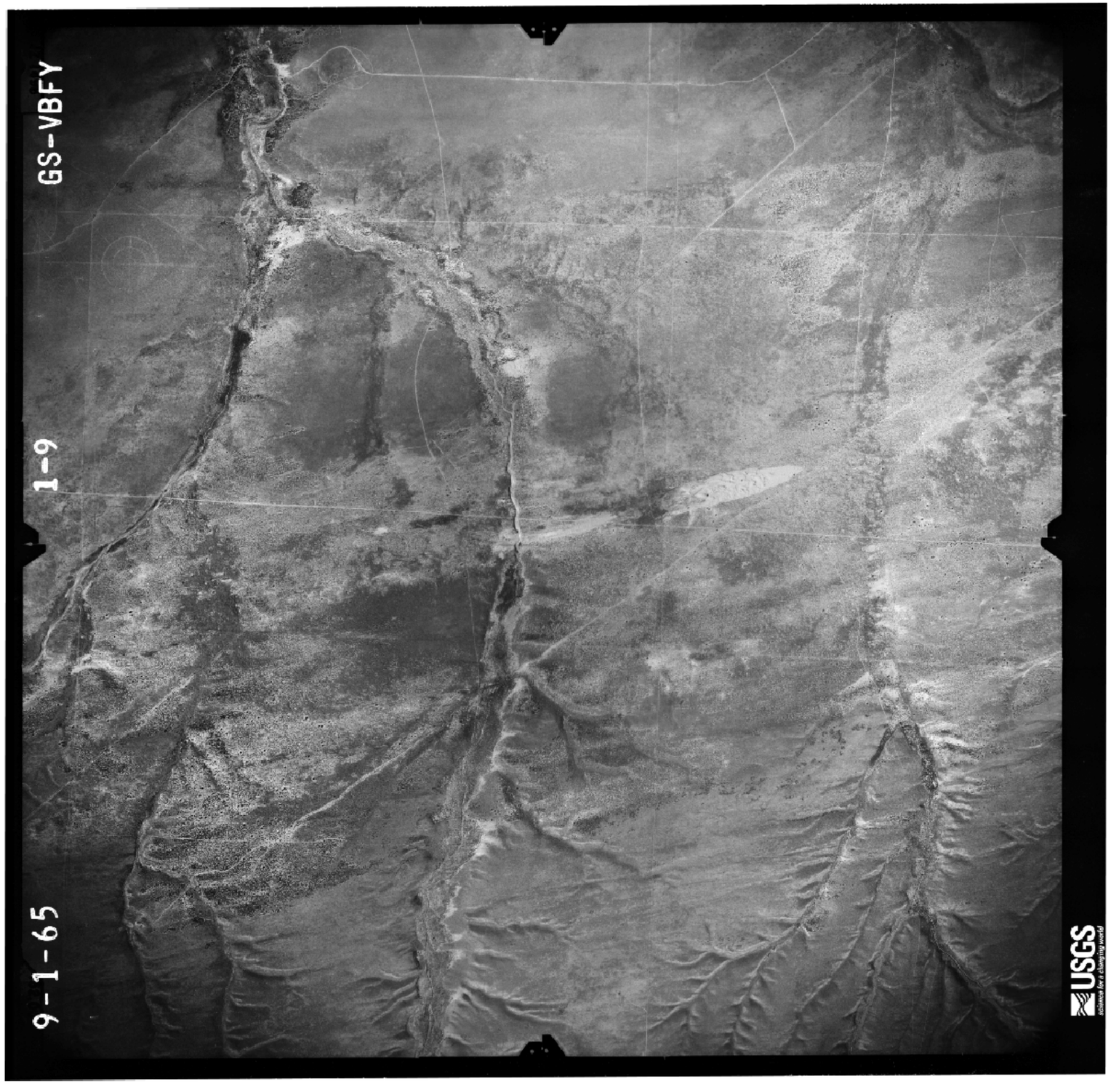
FIGURE L-2

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	M. Mireiter	5/9/07	BoardmanAFR_083_AppendixL_3_SI



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated September 1, 1965.

N

0 1,000 2,000 4,000
Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

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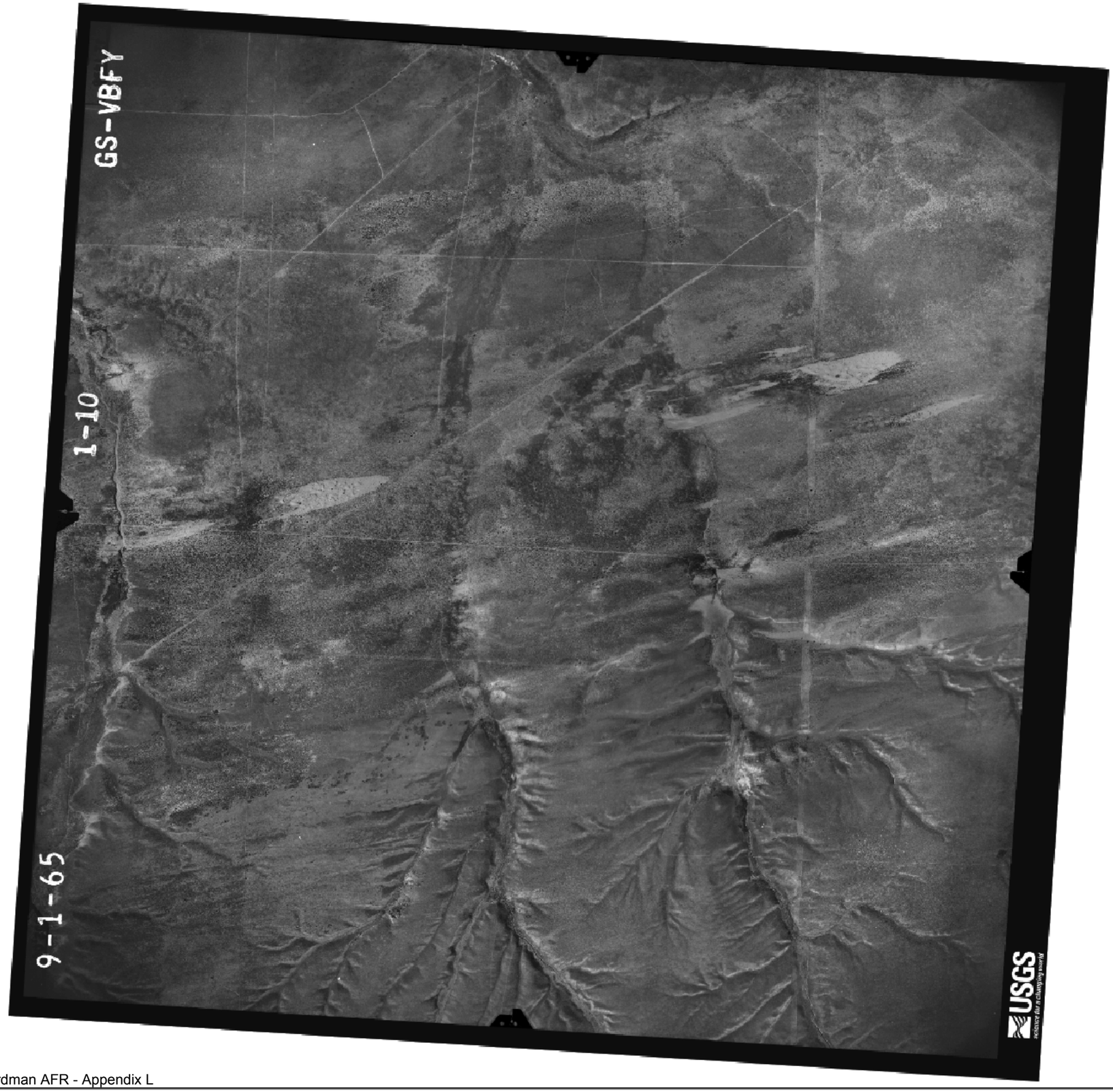
FIGURE L-3

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

Shaw® Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	*M. Mireiter*	*5/9/07*	*BoardmanAFR_084_AppendixL_4_SI*



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated September 1, 1965.

N

0 1,000 2,000 4,000
Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

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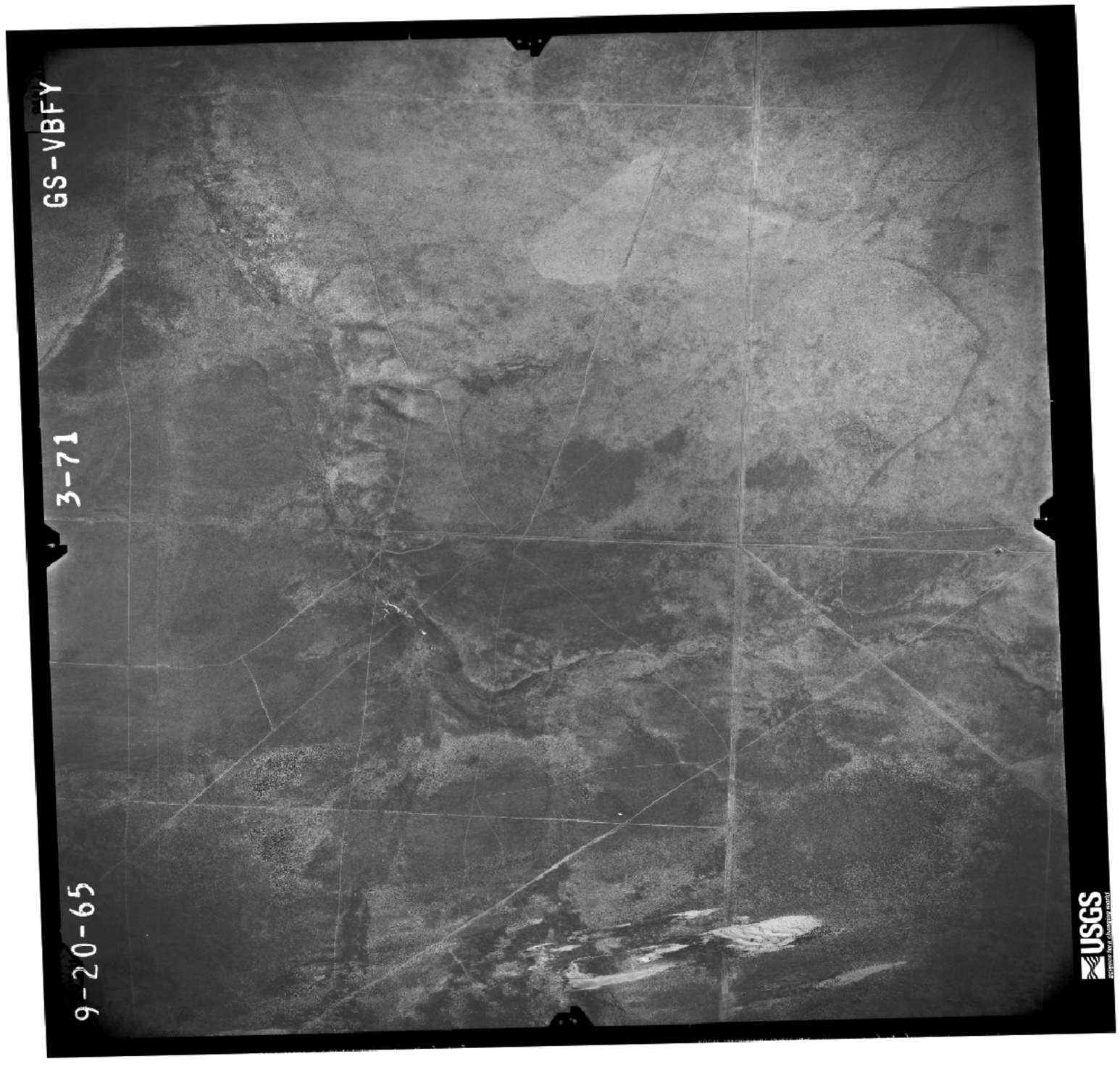
FIGURE L-4

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

Shaw® Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	*M. Mireiter*	*5/9/07*	*BoardmanAFR_085_AppendixL_5_SI*



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated September 20, 1965.

N

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Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

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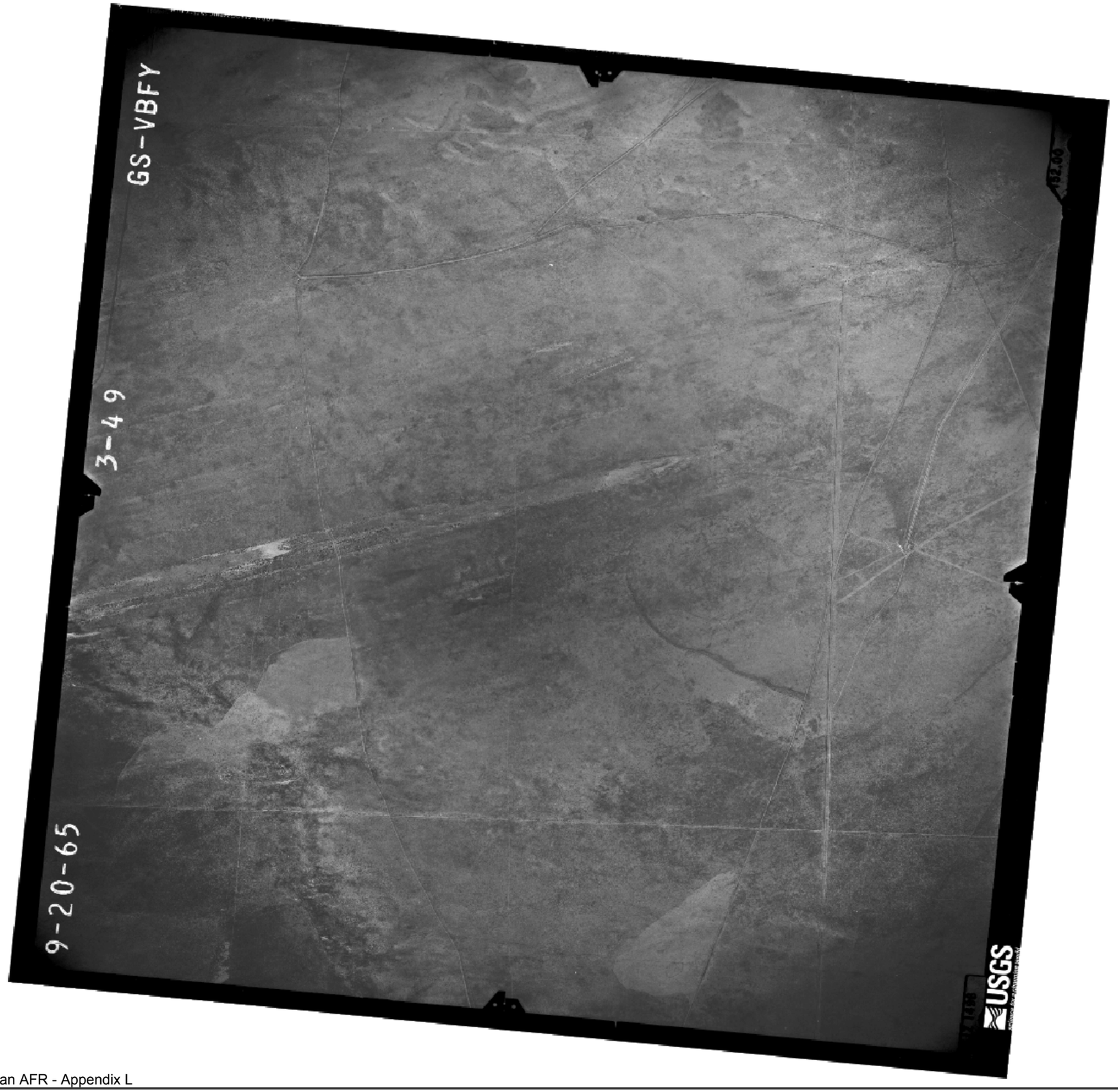
FIGURE L-5

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

Shaw® Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	M. Mireiter	5/9/07	BoardmanAFR_086_AppendixL_6_SI



NOTES:
1) Aerial photograph obtained from the U.S. Geological Survey and is dated September 20, 1965.

N

0 1,000 2,000 4,000
Feet

REFERENCE/PROJECTION: NAD 83 UTM Zone 11N

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FIGURE L-6

HISTORICAL AERIAL PHOTO

BOARDMAN AIR FORCE RANGE

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