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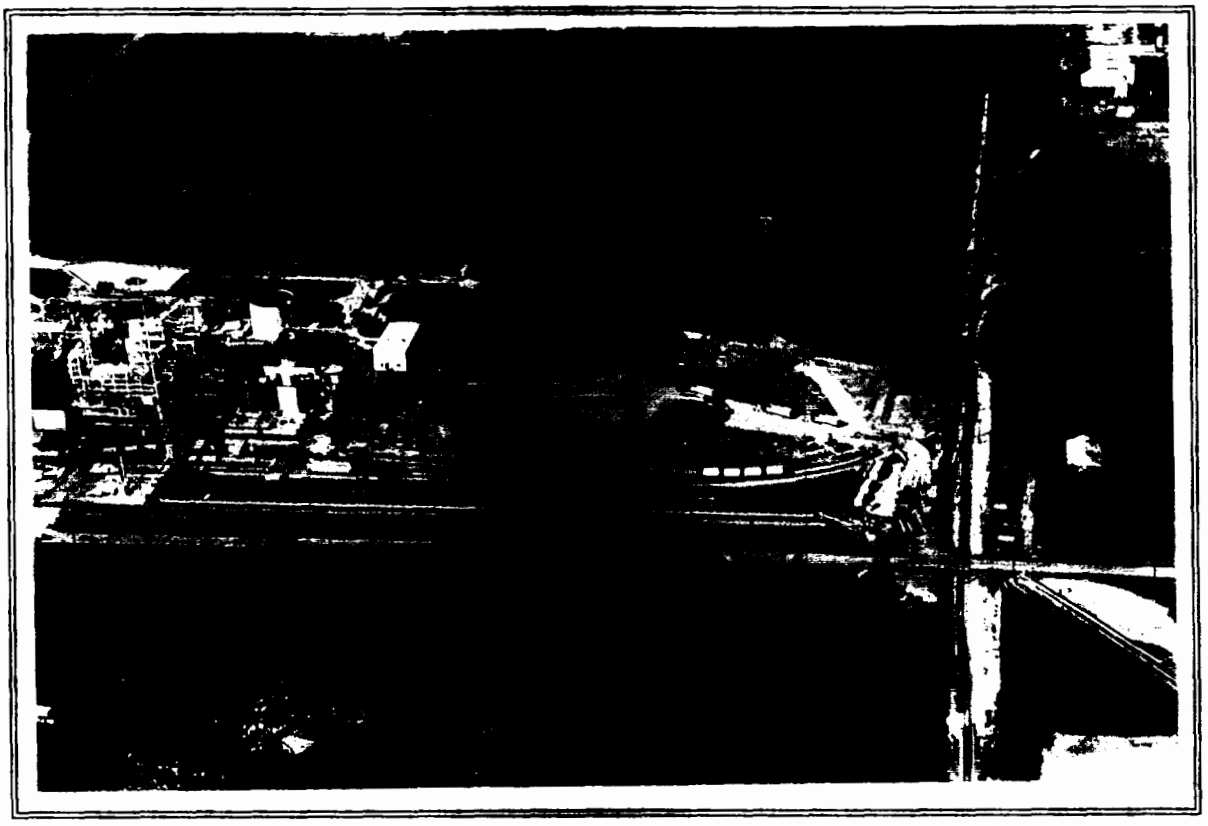
Completion of Remedial Action Report

For

MILLENNIUM INORGANIC CHEMICALS, INC.
PLANT II, $TiCl_4$ FACILITY
ASHTABULA, OHIO



May 1, 2000

Revision 1

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Millennium
Inorganic Chemicals

Ashtabula Complex - Plant 2
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Ashtabula, Ohio 44004
Tel. 440-994-1400
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February 7, 2000

Ms. Terese A. Van Donsel
Remedial Project Manager
Remedial & Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, IL 60604

Subject: Completion of Remedial Action Report for the Millennium Inorganic Chemicals Inc., Plant 2, $TiCl_4$ Facility, Ashtabula, Ohio

Dear Ms. Van Donsel:

In accordance with the Amended Unilateral Administrative Order (UAO), dated February 24, 1998 and the Explanation of Significant Differences (ESD), dated April 12, 1999, Millennium Inorganic Chemicals Inc. (MIC), is submitting the Completion of Remedial Action Report (CRAR) for your approval. The Amended UAO directed the Respondent to perform a remedial action for the remedy described in the September 29, 1997, Record of Decision ("1997 ROD") for Operable Unit No. 2 (OU2) of the Fields Brook Superfund Site. The CRAR is MIC's final endeavor in successfully completing the remedial action.

Upon your review and acceptance of this report, MIC requests that you issue a "no further action" statement that acknowledges OU2 as no longer being a part of the Fields Brook Superfund Site.

If you have any questions, please do not hesitate to contact this office.

Sincerely,

Josef Shehabi

Josef Shehabi
Project Manager

cc: Mike Lavery - MIC
Don Rooney - MIC
Rick Hughes - MIC
Stuart Breslow - MIC
William Schildt - MIC

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES DIVISION
MK-FERGUSON PLAZA
1500 West 3rd Street
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Transmittal Letter

Project Name:	Transmittal Number:	Work Order Number:
Fields Brook Superfund Site **Millennium Inorganic Chemicals** **Ashtabula, Ohio**	4923-TL-037	4923
	Date: February 7, 2000	

To:

Ms. Terese Van Donsel
Remedial Project Manager
US EPA
SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604

REFERENCES

Name:

Equipment Number:

Purchase Order Number:

Vendor Order Number:

☒ **TRANSMITTED HEREWITH** ☐ **RETURNING FOR STATUS NOTED**

For:

- ☐ Review and comment
- ☒ Approval
- ☐ Record
- ☐ Information
- ☐ Other

Reviewed	**A**
Review as noted	**B**
Resubmit	**C**
For information	**D**
Other _____	**E**

Quantity	Item	Title/Description
6	Completion of Remedial Action Report for the Millennium Inorganic Chemicals Site.	

DISTRIBUTION:

Josef M. Shehabi - MIC
Don Rooney - MIC
Mike Lavery - MIC
Rick Hughes - MIC
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Stuart Breslow - MIC
File: 4923-2.021 T/L Only
4923-10.03

By:

Name: Jeff Kyser

Title: Project Manager

Completion of Remedial Action Report

For

MILLENNIUM INORGANIC CHEMICALS, INC.
PLANT II, $TiCl_4$ FACILITY
ASHTABULA, OHIO

Millennium
Inorganic Chemicals

MILLENNIUM INORGANIC CHEMICALS, INC.
Contract # 4409941417

May 1, 2000

Revision 1

COMPLETION OF REMEDIAL ACTION REPORT

MILLENNIUM INORGANIC CHEMICALS, INC.
PLANT II, $TiCl_4$ FACILITY
ASHTABULA, OHIO

Revision 1

May 1, 2000

CONTRACT # 4409941417

Prepared for

MILLENNIUM INORGANIC CHEMICALS, INC.
Ashtabula Plant II
2426 Middle Road
Ashtabula, Ohio 44004

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4/27/00

Jeffrey D. Kyser, P.E.
MK Project Manager

Date

RESPONDENT ACCEPTANCE

Josef M. Shehabi

4/27/00

Josef Shehabi, Millennium Inorganic Chemicals, Inc.
Respondent's Project Coordinator

Date

EXECUTIVE SUMMARY

This Completion of Remedial Action Report (CRAR) summarizes the remedial activities performed by Millennium Inorganic Chemicals Inc. (MIC) at their Plant 2, $TiCl_4$ facility located in Ashtabula, OH. It describes all the work performed by MIC during the Remedial Action (RA) as identified by the U.S. Environmental Protection Agency (USEPA) in the *Amended Unilateral Administrative Order* (UAO) - Docket No. V-W-98-C-449, dated February 1998 [USEPA, 1998].

Remedial action at MIC's property was mandated by the USEPA - *Record of Decision* (ROD) *for the Source Control Operable Unit* (SCOU), dated September 1997 [USEPA, 1997], the Amended UAO, the *Statement of Work* (SOW) [USEPA, 1998], and the *Explanation of Significant Differences* (ESD), dated April 1999 [USEPA, 1999], for the MIC Plant 2 $TiCl_4$ facility. These documents identified the $TiCl_4$ facility as a Source Control Operable Unit (SCOU) to the Fields Brook Superfund Site, a watershed in Ashtabula, Ohio that requires soil, surface water and groundwater remediation. The documents required that both a Remedial Design (RD) and an RA Work Plan be developed and approved by USEPA so that the RA may proceed. As a result, MIC contracted Morrison Knudsen Corporation (MK) to develop the *100% Remedial Design* [MK, 1999] and the *Remedial Action Work Plan* [MK, 1999]. These documents identified the requirements given by USEPA and the actions to be taken to ensure that the requirements of the RA were met.

The objectives of the RA included the following: excavation, management and disposal of all soil containing polychlorinated biphenyls (PCBs) or naturally occurring radioactive material (NORM) at concentrations above the defined cleanup goal (CUG); radioactive and occasional PCB sampling at the excavation limits; installation of a non-erosional cover over areas not excavated to the CUG, and subsequent backfill and site restoration. All of this work was to be performed in a manner that prevented the release of contaminated materials from MIC's property to Fields Brook.

MIC contracted Great Lakes Construction (GLC) to perform the actual RA work. Physical work to complete the RA began inside the $TiCl_4$ facility's main production area at the Therminol Tank Area. Excavation proceeded to the depths required by the 100% RD. Excavated soil from this area was disposed at Chemical Waste Management in Model City, NY. Upon completion of excavation activities, **appropriate verification sampling was utilized to determine that sufficient soil hade been excavated.** The area was then backfilled with clean fill and restored with asphalt pavement to match the surrounding plant areas. **This work was performed within the Facility Stormwater Collection Area (FSCA) and did not pose a risk of recontamination to Fields Brook.**

Work proceeded to the Mining Residuals Pile (MRP), the main portion of excavation, where approximately 70,000 cubic yards of soil were excavated and shipped to MIC's process landfill, located approximately two miles east of the $TiCl_4$ facility. As portions of the MRP excavation were completed, areas were surveyed, radiologically sampled and backfilled with clean fill.

Upon completion, the MRP received a six-inch cover of topsoil and was seeded with an approved seed mix.

As work activities progressed at the Therminol Tank Area and the MRP, five additional small areas within MIC's operating plant were remediated as well. Both remedial and restoration work were performed in the same manner as work at the Therminol Area, with the exception that excavated soil was disposed in MIC's landfill rather than at Chemical Waste Management.

All work activities were completed in accordance with both the *100% RD* and *RA Work Plan* and all work complied with applicable federal, state and local regulations. Pre-Final and Final Inspections of the RA work were performed by USEPA, U.S. Army Corps of Engineers (USACE), Ohio Department of Health (ODH), MIC and MK. The work performed was deemed satisfactory by all parties involved. Based on the work completed, it is recommended that no further environmental action be necessary for the MIC Plant 2, $TiCl_4$ facility and that USEPA officially close out all respondent requirements pertaining to this SCOU of the Fields Brook Superfund Site.

CHRONOLOGICAL SUMMARY

May 17, 1999	Great Lakes Construction mobilized to site.
May 25, 1999	Held preconstruction meeting.
June 22, 1999	Received approval from USEPA to begin work in Therminol Tank Area.
June 23, 1999	Began work in Therminol Tank Area.
July 15, 1999	Completed excavation in Therminol Tank Area.
July 16, 1999	Began excavation in Plant Process Area "C".
July 20, 1999	Completed excavation of Plant Process Area "C".
July 21, 1999	Received approval from USEPA to begin work in Mining Residuals Pile.
July 26, 1999	Began excavation in Mining Residuals Pile.
August 23, 1999	Completed restoration of Therminol Tank Area and Plant Process Area "C".
September 3, 1999	Completed excavation within North and Non Traffic Areas.
September 22, 1999	Completed excavation within Laydown Area.
October 15, 1999	Completed main excavation within MRP.
October 18, 1999	Began and completed excavation in Plant Process Area "A".
October 19, 1999	Began and completed excavation in Plant Process Area "D".
October 20, 1999	Performed Pre-Final Inspection. Began and completed excavation in Plant Process Area "B". Began excavation of Plant Process Area "E".
October 26, 1999	Completed excavation in Plant Process Area "E".
November 10, 1999	Completed installation of non-erosional fabric and 6-inch ODOT 304 stone cover around stormwater and settling ponds.
November 12, 1999	Completed restoration of Plant Process Areas "A", "B", and "D".
November 18, 1999	Completed site restoration of MRP. Completed gravel haul road.
November 19, 1999	Completed seeding of MRP. Great Lakes Construction demobilized.
December 8, 1999	Performed Final Inspection.

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ACRONYMS

ALARA	As Low As Reasonably Achievable
ALMI	American Landfill Management, Inc.
ARAR	Applicable, Relevant and Appropriate Regulations
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CQA	Construction Quality Assurance
CQAP	Construction Quality Assurance Plan
CRAR	Completion of Remedial Action Report
CUG	cleanup goal
CWM	Chemical Waste Management
DOT	Department of Transportation
dpm	disintegrations per minute
ESD	Explanation of Significant Differences
FIDLER	Field Instrument for the Detection of Low Energy Radiation
FSCA	Facility Stormwater Collection Area
GLC	Great Lakes Construction Company
GM	Geiger-Mueller
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
HSO	Health and Safety Officer
LAW	**large area wipe**
LSM	low shrink mortar
MIC	Millennium Inorganic Chemicals, Inc.
mg/kg	milligrams per kilogram
MK	Morrison Knudsen Corporation
MRP	Mining Residuals Pile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List

ACRONYMS (continued)

OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
PIR	Problem Identification Report
PPE	personal protective equipment
QA/QC	Quality Assurance / Quality Control
RCRA	Resource Conservation and Recovery Act
RCS	Radiological Control Supervisor
RCT	Radiological Control Technician
RD	Remedial Design
RMIES	RMI Environmental Services
ROD	Record of Decision
SCOU	Source Control Operable Unit
$TiCl_4$	Titanium Tetrachloride
TiO_2	Titanium Dioxide
TLD	Thermoluminescent Dosimeter
TSCA	Toxic Substances Control Act
UAO	Unilateral Administrative Order
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

1.0
INTRODUCTION

This Completion of Remedial Action Report (CRAR) describes the remedial action performed at the Millennium Inorganic Chemicals, Inc. (MIC) Plant 2, Titanium Tetrachloride ($TiCl_4$) facility, Fields Brook Superfund Site, Ashtabula, Ohio. This report details the actions taken by MIC, using the "Enhanced Remedy" specified in the *Amended Unilateral Administrative Order* (UAO), dated February 1998 [USEPA, 1998], to manage soils containing polychlorinated biphenyls (PCBs) and Radium-226/228 that had the potential to recontaminate Fields Brook.

The CRAR has been prepared for MIC by Morrison Knudsen Corporation (MK) under contract number 4409941417 to be submitted to the United States Environmental Protection Agency (USEPA) for their approval. It has been prepared in accordance with the USEPA - *Record of Decision* (ROD) *for the Source Control Operable Unit* (SCOU), dated September 1997 [USEPA, 1997], the Amended UAO, the Statement of Work (SOW) and the *Explanation of Significant Differences* (ESD), dated April 1999 [USEPA, 1999], for the MIC Plant 2 $TiCl_4$ facility.

1.1 BACKGROUND

Fields Brook, located in Ashtabula, Ohio, is a tributary stream to the Ashtabula River. The Fields Brook Superfund Site is a multi-source site in which soil, sediment, groundwater and surface water have been impacted throughout the Fields Brook watershed. The Fields Brook Site was placed on the National Priorities List (NPL) on September 8, 1983. The Superfund site consists of Fields Brook, its tributaries, and surrounding areas which contribute, potentially may contribute, or have contributed to the contamination of the brook and its tributaries. The MIC facility has been identified as a source of PCBs to Fields Brook and the facility physically represents a small portion of the Fields Brook Superfund Site. The UAO, issued by USEPA on December 24, 1997, required MIC to remove all PCB contaminated soils greater than 50 milligrams per kilogram (mg/kg). Provisions to implement an "Enhanced Remedy" to remove soils ≥ 3.1 mg/kg are contained in the Amended UAO.

In July 1998 it was discovered that the Fields Brook Site also contained elevated levels of naturally occurring Radium-226 (Ra-226) and Radium-228 (Ra-228). The MIC facility, specifically the MRP, was identified as a source of the radioactive contamination that must be addressed during remedial action. Provisions to remove soils containing elevated levels of naturally occurring Ra-226 and Ra-228 ≥ the radiological CUG are included in the ESD.

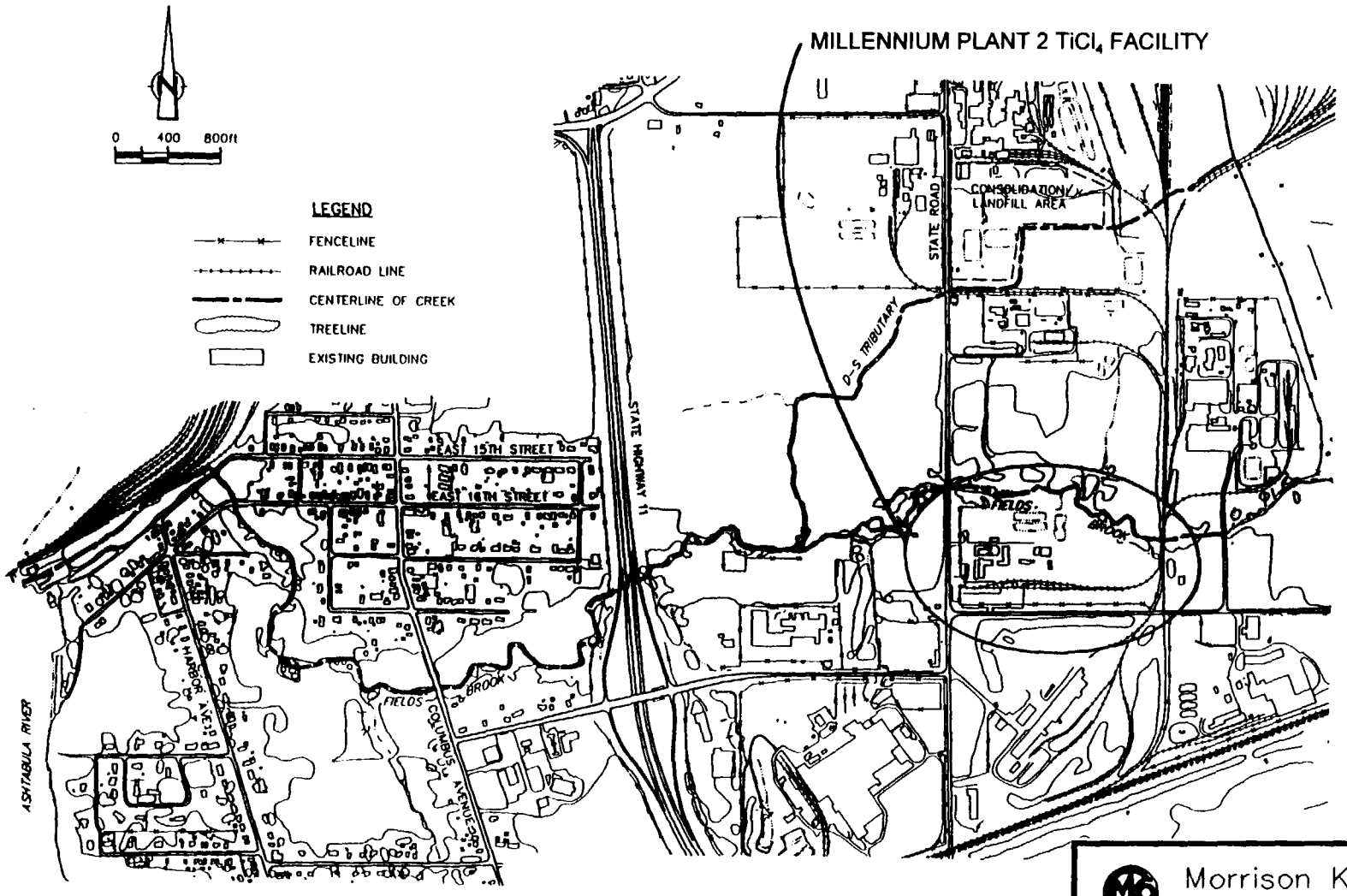
1.1.1 Site Location

The $TiCl_4$ plant is an operating chemical manufacturing facility encompassing approximately 22 acres. It is located in the south-central portion of the industrialized area of the Fields Brook Superfund Site. The property is bounded on the south by Middle Road and by the Acme Scrap Iron & Metal facility, to the west by State Road, to the north by Fields Brook and Detrex Corp., to the east by the Vygen Corporation, and to the southeast by MIC's Plant 2 Titanium Dioxide

(TiO_2) facility. The location of the MIC property and surrounding areas is shown in Figure 1-1.

1.1.2 Site History

The $TiCl_4$ plant was constructed in 1958, and initially operated by the Stauffer Chemical Company. National Distillers and Chemicals bought the facility in 1959 and operated it until 1963, when they sold it to Cabot Titania. Cabot Titania operated the plant until 1972, when it was leased to Gulf and Western Industries, Inc. Gulf and Western purchased the plant in 1975 and continued to operate it until they sold it to SCM in 1983. SCM changed its name to Millennium Inorganic Chemicals, Inc. in 1997.



Morrison Knudsen Corporation
1500 West Third Street
Cleveland, Ohio 44113

SOURCE: Conestoga-Rovers & Associates

LOCATION: ASHTABULA, OHIO

MILLENNIUM PLANT 2 TiCl4 FACILITY
VICINITY MAP

DRAWN BY:	CHECKED BY:	PROJECT NO:	DATE:	FIGURE NO:
JDK	JDO	4923	05/27/98	1-1

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1.2 OBJECTIVES

In the SCOU ROD, USEPA directed MIC to excavate all soils with total PCB concentrations greater than or equal to 50 mg/kg and, at a minimum, place a cover over all soils ≥ 3.1 mg/kg that are outside of the Facility Stormwater Collection Area (FSCA). MIC decided instead to pursue an enhanced remedy. The enhanced remedy stated that MIC would excavate soil containing PCBs at concentrations ≥ the CUG (3.1 mg/kg) either outside the FSCA, or within the entire MRP. It also stated that MIC would excavate soil containing ≥ 50 mg/kg PCBs inside the FSCA. As a result of the ESD, USEPA further directed MIC to excavate all soils on-site containing naturally occurring Ra-226 and Ra-228 ≥ the radiological CUG of 12 picocuries per gram (pCi/g) (10 pCi/g + 1 pCi/g Ra-226 background and 1 pCi/g Ra-228 background).

With the enhanced remedy as MIC's goal, the following items were objectives that were addressed during the RA:

- prevent recontamination of Fields Brook
- removal, management and disposal of PCB contaminated soil containing ≥ 3.1 mg/kg PCBs within the MRP or outside the FSCA
- removal, management and disposal of PCB contaminated soil containing ≥ 50 mg/kg PCBs inside the FSCA
- removal, management and disposal of soil on-site containing total radium ≥ 10 pCi/g + 1 pCi/g Ra-226 background and 1 pCi/g Ra-228 background for a total of 12 pCi/g
- site restoration

1.3 REPORT ORGANIZATION

This CRAR is organized into the following sections:

- Section 1 - Introduction
- Section 2 - Regulatory Compliance
- Section 3 - Work Execution
- Section 4 - Quality Assurance
- Section 5 - Health and Safety
- Section 6 - Conclusions and Recommendations
- Section 7 - References

The following appendices support actions described in this Completion of Remedial Action Report:

- As-Built Drawings 4923-106 through 108, 113, 114 and 117 (Appendix A)
- Analytical Results (Appendix B)
- Installed Material Data (Appendix C)
- Construction Quality Assurance Reports (Appendix D)
- Radiological Surveys (Appendix E)
- Health and Safety Monitoring Results (Appendix F)
- Photographs (Appendix G)
- Interim Measures Letter Report (Appendix H)

2.0
REGULATORY COMPLIANCE

This CRAR describes the actions performed to fulfill the requirements of the ROD, the amended UAO and the ESD. It has been developed to satisfy reporting requirements defined in Section 116 of the amended UAO. The RA was performed to remediate the site and obtain a release from USEPA stating that it is no longer a source of contamination to Fields Brook.

Due to the fact that remedial work involved was a CERCLA action, no permits were required to perform the work other than those by applicable, relevant and appropriate regulations (ARARs) and any substantive requirements of those ARARs as identified by the ROD. Specific requirements of the SOW are addressed in Table 2-1 on the following page.

All excavated waste generated during the execution of the RA was characterized as containing PCBs and NORM, except for soil from the Plant Process Areas, which contained PCBs only. Both PCBs and NORM were conditionally approved for disposal in the Landfill. Conditions of the approval are included in Appendix H of the 100% RD. **MIC additionally pursued and obtained a permit modification from the Ohio Environmental Protection Agency (OEPA) for disposal of PCB and radium contaminated soil into the Landfill [OEPA, 1999].** No unexpected wastes were encountered during excavation, therefore all excavated waste, with the exception of soil from the Therminol Tank Area, was disposed in the Landfill.

Waste that was hauled to the Landfill was considered hazardous material that required a Department of Transportation (DOT) permit to be hauled. GLC's subcontractor, Dart Trucking, possessed a DOT permit and utilized drivers that were licensed to haul DOT regulated material. Each shipment was accompanied by a Bill of Lading for hazardous materials and was placarded in accordance with DOT requirements.

Waste from the Therminol Tank Area was shipped to Chemical Waste Management (CWM) in Model City, NY. Prior to shipping the waste, waste profiles were completed and provided to CWM. MIC also received approval from USEPA to ship waste to CWM prior to waste shipment.

Upon completion of work in contaminated areas, all equipment was verified both clean of PCB contamination in accordance with Toxic Substance Control Act (TSCA) guidelines, and clean of radiological contamination in compliance with Nuclear Regulatory Guide 1.86.

TABLE 2-1 REMEDIAL DESIGN/ REMEDIAL ACTION SCHEDULE		
SUBMISSION/ACTIVITY	**DUE DATE**	**STATUS**
Effective Date of Amended UAO.		Effective April 8, 1998.
Notice Concerning Changes in Existing QAPP	Within ninety (90) days after the effective date of the UAO or ninety (90) days after PRPs receipt of U.S. EPA's decision concerning the Millennium process waste landfill, whichever is later.	Submitted to U.S. EPA on May 5, 1998.
Intermediate Remedial Design and Associated Submittals • 60% Design and Specifications Plan • Cost estimate • Project Schedule	Within (90) days after the effective date of the UAO or ninety (90) days after PRPs receipt of U.S. EPA's decision concerning the Millennium process waste landfill, whichever is later.	60% Remedial Design was optional per U.S. EPA and was not submitted to U.S. EPA for review.
U.S. EPA issues "stop the clock" order.		**Effective June 10, 1998.**
Pre-Final Remedial Design and Associated Submittals • 90% Design and Specifications Plan • Cost Estimate • Project Schedule • Final Field Sampling Plan/QAPP • Draft Construction Quality Assurance Objectives • Draft Community Relations Support Plan	**The Pre-Final Remedial Design and Associated Submittals are due within one hundred sixty five (165) days of the effective date of the UAO or within one hundred sixty five days after PRPs receipt of U.S. EPA's decision concerning the Millennium process waste landfill, whichever is later.**	**Despite "stop the clock" order, Millennium submits 90% Remedial Design and Associated Submittals to U.S. EPA on September 30, 1998.**
Final Remedial Design and Associated Submittals • 100% Design and Specifications Plan • Cost Estimate • Project Schedule • Final Field Sampling Plan/QAPP • Draft Construction Quality Assurance Plan (CQAP) • Final Community Relations Support Plan • Draft Contingency Plan	Within (30) days of receipt of U.S. EPA's comments on Pre-Final Design and Associated Submittals.	Millennium submits 100% Remedial Design and Associated Submittals to U.S. EPA on March 15, 1999.

TABLE 2-1 REMEDIAL DESIGN/ REMEDIAL ACTION SCHEDULE		
SUBMISSION/ACTIVITY	**DUE DATE**	**STATUS**
Award RA Contract(s)	Within (30) days after the U.S. EPA's Approval of Final Design/Notice of Authorization to Proceed with RA.	Millennium awarded RA Contract to Great Lakes Construction on February 22, 1999.
Draft RA Work Plan and Associated Submittals • Final Construction Quality Assurance Plan (CQAP) • Final Contingency Plan • Draft OM&M Plan • Draft Procedures and Plans for Decontamination of Equipment and Disposal of Contaminated Materials • Updated detailed Project Schedule consistent with approved RD • Draft Health and Safety Plan	Within seventy-five (75) days after U.S. EPA's Approval of Final Design/Notice of Authorization to Proceed with RA.	Draft RA Work Plan submitted to U.S.EPA May 12, 1999.
Final RA Work Plan and Associated Submittals • Final Construction Quality Assurance Plan (CQAP) • Final Contingency Plan • Draft Final OM&M Plan • Final Procedures and Plans for Decontamination of Equipment and Disposal of Contaminated Materials • Updated detailed Project Schedule consistent with approved RD • Final Health and Safety Plan	Within (21) days of receipt of U.S. EPA's comments on Draft RA Work Plan and Associated Submittals.	Final RA Work Plan submitted to U.S. EPA June 29, 1999.
Pre-Construction Inspection and Meeting	Within fifteen (15) days after U.S.EPA's approval of the RA Work Plan. Note that U.S.EPA may require construction to proceed based on a partial approval of the RA Work Plan.	Completed June 20, 1999 after partial approval of RA Work Plan by U.S. EPA.

TABLE 2-1 REMEDIAL DESIGN/ REMEDIAL ACTION SCHEDULE		
SUBMISSION/ACTIVITY	**DUE DATE**	**STATUS**
Initiate Construction of the RA	Within fifteen (15) days after Pre-Construction Inspection and Meeting.	Work fully commenced July 26, 1999 after approval of the 100% RD and the RA Work Plan by U.S. EPA on July 21, 1999.
Completion of Construction	In accordance with the U.S. EPA's approved RA construction schedule. Construction shall be sequenced and performed in such a way that the cleanup of the area outside of the FSCA shall be completed by January 30, 2000.	Completed October 15, 1999.
Pre-final Inspection	**Within fifteen (15) days after completion of pre-final construction.**	**Completed October 20, 1999.**
Final Inspection	**Within (15) days after completion of work identified in pre-final inspection report. No later than thirty (30) days after submittal of pre-final inspection report, unless U.S. EPA authorizes an extension.**	**Completed work from Pre-Final Inspection Report November 19, 1999. Completed Final Inspection December 8, 1999.**
Final OM&M Plan	No later than Pre-final Inspection.	Not required for $TiCl_4$ plant per U.S. EPA due to "Enhanced Remedy". Landfill Draft OM&M Plan is tentatively scheduled for submittal to U.S. EPA in March, 2000. Additional chemical data, per the Landfill permit, to be supplied to T. Van Donsel at her request.
Completion of Remedial Action Report	Within thirty (30) days after final inspection.	U.S. EPA granted 30 day extension to be submitted by February 8, 2000.
Progress Reports	Monthly, on the 10th day of the following month.	Submitted on a monthly basis.
OM&M Reports	Quarterly, on the 10th day of the month (January, April, July, October).	Not required for $TiCl_4$ plant per U.S. EPA due to "Enhanced Remedy". Landfill OM&M reports to be addressed in Landfill OM&M Plan.

3.0
WORK EXECUTION

RA activities consisted of the following main components:

- Interim Measures
- Site Preparation
- Excavation
- Cleanup Verification
- Backfill and Site Restoration
- Decontamination
- Waste Management

This part of the report has been broken down into the following sections that describe each component listed above.

3.1 INTERIM MEASURES

In October, 1998, prior to the approval of the 100% RD, the opportunity arose for MIC to perform excavation adjacent to their wastewater clarifier, which has a capacity of approximately two million gallons, while it had been emptied during an annual plant shutdown. Performing excavation while the clarifier was empty alleviated a major safety concern for MIC. The Interim Measures were performed in the same manner as the other RA work with the exception that excavated material was hauled to the MRP for temporary storage until the RA was performed. **Prior to authorizing the Interim Measures, USEPA consulted TSCA staff, who approved the approach.** Details of the Interim Measures were submitted to USEPA by means of a letter report dated November 11, 1998. The letter report has been included in Appendix H.

3.2 SITE PREPARATION

Daily work permits were drafted by GLC and signed by appropriate MIC personnel. GLC then mobilized and set up the following: decontamination facilities; exclusion zone fencing; a means to store contaminated water and; stormwater management/erosion control features. In addition, paved haul roads were constructed at the $TiCl_4$ plant's southeast corner to Grid #1 and at the northeast corner to Grid #132 as shown on the Excavation Limits (Drawing 4923-107).

3.3 EXCAVATION

The objective of excavation activities was to remove all on-site soil identified as containing total radium (Ra-226 and Ra-228) ≥ the radiological CUG and soil containing PCBs at concentrations ≥ 3.1 mg/kg either outside the FSCA or within the MRP. Additionally, soil containing ≥ 50 mg/kg PCBs inside the FSCA was to be excavated.

Excavation activities were broken down into five areas as follows:

- Plant Process Areas
- Mining Residuals Pile
- North Traffic Area
- Non-Traffic Area
- Laydown Area and Existing Soil Piles

Upon completion of the RA, it was determined that approximately 70,000 cubic yards of contaminated material were excavated from the $TiCl_4$ facility.

3.3.1 Plant Process Areas

3.3.1.1 Therminol Tank Area

Prior to intrusive activities, the above ground concrete and brick walls were demolished and transported to the Landfill. Once completed, a temporary decontamination facility was set up and the Therminol Tank Area was zoned off as a hazardous area. The pavement and underlying soil were excavated to the limits of ≥ 50 mg/kg PCBs, loaded and transported to CWM in Model City, NY. **It was noted that an oily material was discovered near the surface while excavating in area TTA-4.** Once the excavation limits were reached, the areas were surveyed by a licensed surveyor to ensure that the planned excavation depths were achieved. If the survey indicated that design excavation depths had been achieved, soil samples were collected and field analyzed for PCBs using an Enviroguard Immunoassay PCB in Soil Test Kit. Analytical results are included in tabular form within Appendix B. Upon receipt of acceptable analytical results, the Therminol Tank Area was backfilled with clean fill and restored as described in Section 3.4.

3.3.1.2 Additional Plant Areas

Five additional areas required excavation within the Plant Process Area. These areas are identified as Areas "A", "B", "C", "D" and "E". The five areas were excavated, surveyed and verified clean in the same manner as the Therminol Tank Area. Excavated material was disposed on-site at the Landfill. Backfill and restoration of these areas is discussed in Section 3.4.

While excavating in Areas "A" and "E", numerous below grade items (i.e., foundation walls, sewer pipes, concrete thrust block) were encountered within the excavation area and proceeded beyond the excavation area either vertically or horizontally. When this occurred, either a soil sample immediately adjacent to the item or a wipe sample directly on the item was collected and field analyzed for PCBs. Analytical results indicated that the samples contained < 50 mg/kg PCBs and the items were allowed to remain in place.

In Areas "B", "C", and "D", below grade foundation walls were encountered within the lateral limits of excavation that bound the excavation on one side. In each area, the foundation walls extended below the required depth of excavation, therefore it was determined that excavation could cease at the wall rather than continue to the original design depth. In each case that this situation occurred, excavation was terminated no more than two feet short of the original design depth.

3.3.2 Mining Residuals Pile, North and Non-Traffic Areas

Excavation within these areas began at the paved haul roads located at the southeast end of the MRP and northwest end of the North Traffic Area. The areas to be excavated were divided into grids for the purpose of controlling the limits of excavation, and are shown in Drawing 4923-107. Each grid was assigned a unique grid number and marked by survey to control the depth of excavation. Excavation progressed one grid at a time. When the proper excavation depth was reached, a land survey was performed by a licensed surveyor to document that the remedial depth was achieved. After the survey, field screening and soil sampling for radiological contamination was performed. If the field screening indicated that soil in the grid was below the radiological CUG, the grid was immediately backfilled.

3.3.3 Existing Soil Piles and Laydown Area

The Existing Soil Piles consisted of stockpiled soil staged both on and to the south (Laydown Area) of the concrete pad, which is adjacent to the southwest portion of the MRP. The stockpiles on and off the pad were removed, loaded and transported to the Landfill. After removal of the stockpiled material, the underlying concrete pad was cleaned by means of a water wash described in Section 3.5.3. Water from the concrete washing was collected and dispersed over areas of the MRP that had not yet been remediated to serve as aid for dust control.

In addition to removing the stockpiles, MIC opted to remove additional material from the Laydown Area so that it could be paved. The area was excavated to a level of one foot below the grade of the concrete pad and field screened for radiological contamination. The additional material was transported to the Landfill. The area was then backfilled with clean fill and asphalt paved.

3.3.4 Stormwater Control

Stormwater that collected within excavations was removed and temporarily stored in a 4000-gallon water truck. Stored water was used to the extent possible for dust control and soil conditioning within the excavation area. Remaining water was dispersed upon areas of the MRP that had not yet been remediated or sent to the Landfill for soil conditioning uses.

3.3.5 Additional Excavation and Hot Spots

During the course of excavation, there were numerous areas where elevated radiological readings beyond the excavation limits, or "hot spots", were encountered while performing gamma scan walkover surveys. A "hot spot" was defined as an area in the soil that contained radiological readings greater than two times background. One area in particular was along the entire north edge of the design excavation limits. As a result of the high readings, a gamma scan walkover survey was performed on all areas immediately north of the excavation limits up to the 100-year flood plain. Areas of elevated readings were removed and the area was verified clean in the same manner as the rest of the MRP excavation. Additional significant hot spots were encountered at the west end of the Laydown Area, beneath the concrete pad south of Grid 73, and beneath the

nitrogen piping in Grids 39 and 40. All of these hot spots and other minor ones were removed to the point where no elevated readings greater than two times background were detected in the remaining material.

3.4 CLEANUP VERIFICATION

Excavation areas were surveyed for horizontal and vertical control as work progressed to confirm the satisfactory removal of PCB contamination. Once grid areas reached the limits identified on the excavation drawings, Sharp's Surveying, a licensed on-site third party survey crew, was notified to verify depths. After each grid was surveyed, it was field screened and sampled for radiological contamination. Several grids were also sampled for PCBs. After completion of the verification process, the grid was approved to receive backfill.

3.4.1 PCB Verification

At the discretion of USEPA, occasional soil samples were collected and analyzed for PCBs to ensure that no PCB concentrations greater than the CUG were present. These samples were field analyzed using the Enviroguard Immunoassay PCB in Soil Test Kit. Several samples were split and sent to EA Group in Mentor for laboratory analysis as a check on the field analyses. Both field and laboratory analytical results are included in tabular for within Appendix B.

3.4.2 Radiological Verification

During the RA, radium levels for cleanup verification in MRP excavations were analyzed by using both field screening and laboratory methods. Each grid was divided into two half grids of 25' x 50' each. The half grid size was the maximum size of the area used to manage radiological verification surveys.

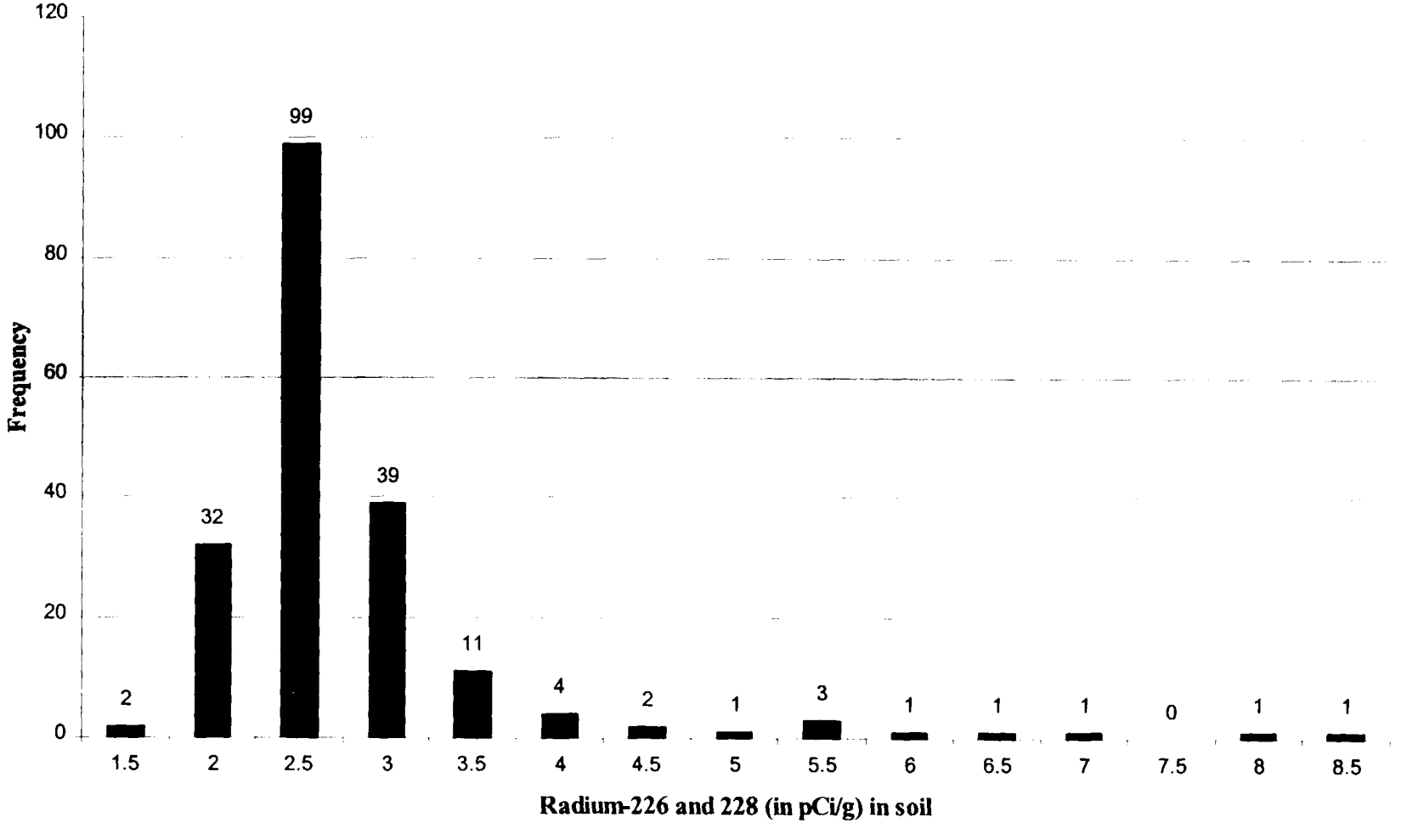
Field screening of soil was accomplished by performing both an in-situ low energy gamma scan survey and a 15-minute, off-site gamma spectroscopy analysis of one liter soil samples.
The in-situ low energy gamma survey consisted of a walkover scan using a field instrument for the detection of low energy radiation (Fidler) to determine the presence of radioactive materials in soil from direct gamma and X-ray emissions and secondary radiations from material surrounding beta and alpha emitters. Simply put, the Fidler was used to locate areas within a half grid that possessed elevated radiological readings or "hot spots". All detected hot spots were removed. In addition to an entire grid walkover to locate hot spots, the Fidler was used to perform a one-minute count in each spot where a soil sample was collected. Results of the walkover surveys are included in Appendix E.

After the walkover survey, soil samples were collected in five separate locations within each half grid. The five samples were composited to form one sample and placed into one liter containers. Each one liter soil sample was analyzed for total radium concentration by RMI Environmental Services (RMIES) using gamma spectroscopy. When the sample was first received by the laboratory, a 15-minute count (analysis) was performed on the sample that gave a quick indicator as to whether or not the sample met the radiological CUG. The sample was then held for a

minimum of 21 days at which time a second analysis for total radium was performed. The 21-day counts were used as the basis for having met the radiological CUG.

Nearly 200 soil samples were collected from the footprint of the MRP. Statistics on sample results demonstrate that the average total radium concentration, including background, was 2.6 pCi/g and the median was 2.3 pCi/g. Natural total radium concentrations in the area are approximately 2 pCi/g. Only two samples were greater than 7 pCi/g, the residential radium cleanup criterion. Figure 3-1 illustrates a representation of the results. Analytical results for the 21-day counts are included in both hard copy and tabular form in Appendix B.

Figure 3-1
21-Day Laboratory Results



3.5 BACKFILL AND SITE RESTORATION

After cleanup verification of an excavated area was completed, backfill activities were allowed to begin in that remediated area. The source of backfill material was the stockpiled soil located at the Landfill. Prior to initial development of the Landfill, soil and groundwater samples were collected in the vicinity of the excavated area during a Phase II Site Assessment performed in 1995 [Montgomery Watson, 1995]. Analytical results indicated that excavated material would be suitable for use as backfill regarding chemical content. Additional sampling and analysis was also performed on the backfill source prior to the beginning of the RA. Analytical results of the recent sampling event are included in Appendix C.

3.5.1 Mining Residuals Pile, North and Non-Traffic Areas

Excavated areas were backfilled with 12-inch loose (uncompacted) lifts that were placed, compacted and compaction tested. Backfill placement continued to within six inches of final grade at which time the area was ready to receive topsoil or gravel as required by the 100% RD. Compaction test results are included in Appendix C.

The MRP was restored by placing six inches of topsoil over backfill material and seeding. Seeded areas received temporary erosion controls that will be maintained until adequate vegetation is established. The North and Non-Traffic Areas were restored either with topsoil and seeding like the MRP, or with 6-inches of gravel, depending on their original cover. The only exception to this was in areas where PCB soil was not excavated. Such areas received a non-erosional cover that is described in Section 3.5.4.

3.5.2 Plant Process Areas

Soil used to backfill the Therminol Tank Area was placed in 12-inch loose lifts and compacted up to within 18 inches of final grade. A 12-inch lift of ODOT 304 stone was placed over the backfill material and compacted. Due to the small size of the other Plant Process Areas, no soil was used as backfill, only the 304 stone. Once the 304 stone passed compaction tests, the Therminol Tank Area and Areas "A", "B", "C", "D" and "E" were paved with a prime coat followed by a 3-inch thick base course, a tack coat and a 2-3 inch thick wearing course of asphalt, respectively.

Both Area "E" and the Therminol Tank Area contained areas where excavation reached depths of 9 and 15 feet respectively. In these areas, conventional placement of backfill was neither a safe nor efficient method. Instead, deep areas were backfilled with LSM 50, a flowable fill that sets up to approximately 1000 psi. With the use of LSM 50, no compaction tests were necessary. A copy of the LSM 50 design mix is included in Appendix C.

3.5.3 Laydown Area

After excavation in the Laydown Area was completed, it was rough graded and proof rolled. A 12-inch lift of ODOT 304 stone was placed and compacted over the entire area. After successful

compaction, the Laydown Area was paved with a prime coat, followed by a 3-inch thick base course, a tack coat and a 2-3 inch thick wearing course of asphalt, respectively. The new paving was compaction tested and gradation tested to ensure compliance with paving specifications. Results of the testing are included in Appendix C.

3.5.4 Non-Erosional Cover

Erodible areas within the FSCA which contained PCB contamination ≥ 3.1 mg/kg that were not removed under the enhanced remedy were required to receive an erosion protection cover. These areas consisted of the soil surrounding MIC's stormwater and settling ponds. The erosion protection cover consisted of geosynthetic material followed by six inches of ODOT 304 stone.

3.6 DECONTAMINATION

As excavation progressed, separate personnel and equipment decontamination areas were established and moved with the excavation when necessary. These areas served as the ingress/egress points for personnel and equipment. At a minimum personnel decontamination areas contained boot wash area, trash bins for contaminated PPE and a small area to frisk for radiological contamination. Equipment decontamination areas typically were constructed of wood frame side walls with HDPE liner as the base. The base would slope to a sump where decontamination water was collected.

After the decontamination areas were dismantled, the underlying soil was visually inspected for potential leaks and received a gamma scan walkover for elevated levels of radiological contamination. Both the visual inspection and gamma scan walkover indicated that no leakage occurred.

3.6.1 Construction and Field Equipment

Construction and field equipment that came into contact with any potentially contaminated material was decontaminated prior to leaving a contaminated area. Major equipment that was decontaminated included; excavators, bulldozers, truck trailers, pumps, water truck, etc. Equipment first received a manual cleaning where all gross visible soil was removed. Afterward, each piece of equipment was decontaminated using a high-pressure/low-volume water wash. After completion of the wash, equipment was visually inspected for signs of contamination. If no contamination was discovered during the visual inspection, each piece of equipment was tested for radioactive materials and PCBs prior to it leaving the site.

Because immediate results could be obtained in the field, equipment was radioactively surveyed and verified clean before PCB wipe samples were collected. Decontaminated equipment was surveyed for radioactive contamination by means of both; random large area wipe (LAW) samples, which were scanned with a Geiger-Mueller (GM) frisker for removable contamination, and direct scans with a GM frisker for fixed contamination. With respect to radiological contamination, equipment was allowed to be released from a contaminated area when radioactive surveys indicated < 200 dpm/100cm^2 beta/gamma removable contamination and < 1000

dpm/100cm^2 total beta/gamma contamination.

Decontaminated equipment was surveyed for PCB contamination by means of wipe samples that were laboratory analyzed. A 100 cm^2 template was used to collect a wipe sample from a random location on each piece of equipment. If analytical results indicated that a wipe sample contained less than 10μg PCBs/100 cm^2, the TSCA specified regulatory cleanup level for wipe samples, the piece of equipment was allowed to be released.

3.6.2 Personnel Decontamination

Personal protective equipment (PPE) that came into contact with potentially contaminated soil were discarded or decontaminated prior to site egress. Plastic trash cans were used for disposable PPE such as Tyvek®, gloves, etc. These containers were disposed of with the contaminated soil at the Landfill. Small items such as hand tools, survey equipment, etc., were also decontaminated within personnel decontamination areas. Prior to leaving a decontamination area, all personnel and small items were surveyed for radioactive contamination by the use of a GM frisker.

3.6.3 Concrete Pad

After the stockpiled soil was completely removed from the concrete pad, the pad was cleaned by means of a water wash. Once the pad appeared to be visually free of soil, it was wipe sampled for PCB analysis and also received a gamma scan walkover survey. Several small areas of concrete that possessed elevated radiological readings were removed using an air hammer.

3.6.4 Decontamination Fluids

All decontamination fluids were collected and temporarily stored in the 4000-gallon water truck until it was used as dust control in contaminated areas or transported to the Landfill for soil conditioning. After completion of its use, the interior of the 4000-gallon water truck was triple rinsed in accordance with 40 CFR 261.7 (B) (3) (I) prior to its release from the site.

3.7 WASTE MANAGEMENT

This section describes methods utilized to manage and dispose the various contaminated waste streams generated during the remedial action activities at the MIC site. All contaminated wastes were disposed in accordance with applicable local, state and federal rules and regulations.

The following is a list of contaminated waste streams generated at the site:

- excavated soil and demolished concrete/pavement
- excavation and decontamination water
- disposable personal protective equipment

3.7.1 Excavated Soil and Demolished Concrete/Pavement

Prior to shipment, appropriate testing for radionuclides was performed on soil from the Therminol Tank Area for disposal characterization. Results were provided to USEPA that indicated the waste contained no levels of radioactive activity above background.

Soil and concrete/pavement removed from excavations were direct loaded into trucks and transported to the Landfill for disposal. Trucks were loaded outside of the contaminated area on loading pads constructed of HDPE liner, so that spillage could be controlled and properly managed. Prior to its transportation, each truck was inspected to ensure that it possessed no loose visual exterior soil contamination. Trucks were also monitored by a dose rate survey and external surfaces verified radiologically clean by LAW before they were allowed to leave the site. Decontamination and verification procedures were discussed in Section 3.5.

All trucks containing contaminated soil were manifested for shipment to the Landfill. A Landfill representative signed each manifest to verify the load was received by the Landfill.

3.7.2 Excavation Water, Stormwater and Decontamination Water

Water and stormwater collected from within the excavation area was considered contaminated (containing PCB or radiological sediment) and was collected and temporarily contained in the 4000-gallon water truck. Decontamination water, generated during high pressure washing of excavation equipment and during decontamination of personnel, was also collected and temporarily stored in the 4000-gallon water truck. When feasible, contaminated water was used for dust control and soil conditioning within the excavation area. Any remaining water was either dispersed upon areas that were not yet remediated, or sent to the Landfill for soil conditioning uses.

3.7.3 Disposable Personal Protective Equipment

Contaminated PPE was placed in plastic bags immediately after use. The bags were loaded into trucks containing contaminated soil and transported to the Landfill for disposal.

3.7.4 Transportation

The transportation of PCB or radioactive containing materials on public roadways was performed by Dart Trucking, a subcontractor to GLC. Dart is a DOT licensed transporter. A manifest was prepared for each shipment of contaminated material to the Landfill and was signed by both an MIC representative and a DOT trained shipper. All vehicles transporting PCB containing materials were placarded and manifested as PCBs, Hazard Class 9, UN2315, Packing Group III. All vehicles possessed tarps, tailgate gaskets and gate lockdowns to prevent leakage, spillage, or fugitive dust during shipment. A total of 5,057 shipments were hauled to the Landfill during the RA. No leaks or spills of any type occurred as a result of RA activities.

During the course of the project, it often became necessary that maintenance be performed on the

trailers used for hauling waste material. When possible, these trailers were serviced on site by an appropriately health and safety trained mechanic or under the direct supervision of health and safety personnel. Occasionally, repair requirements for a trailer were extensive enough that it was not feasible to attempt an on-site repair. In cases such as this, the trailer was released from the site to a local garage where the mechanics and supervisor were appropriately health and safety trained to address the potentially hazardous material within a trailer.

Prior to a trailer's release, several steps were followed to ensure that MIC could maintain control over a released trailer. First, each trailer was emptied, swept clean and verified free of radiological contamination both inside and out. A Dart Trucking representative then initiated an MIC Release Form for Trailer Repair. The form contained pertinent information about the trailer's release that included; the trailer number, date out of service, date into service, trailer tag seal number, and a brief description of the work to be performed. Once the form was initiated, it was submitted to an MIC representative for review. Upon reviewing the form, the MIC representative issued a numbered tag seal to ensure the tailgate was not opened and signed the form. Upon the trailer's return, a driver presented the completed release form to the MIC representative who had originally signed it, and allowed the MIC representative to observe the removal of the numbered trailer tag seal so that it could be verified the tailgate had not been opened. Copies of the MIC Release Forms used during the project are included in Appendix D.

3.8 LANDFILL OPERATIONS

When shipments arrived at the Landfill, each manifest was signed to verify the shipment was received. Trucks were periodically weighed to ensure compliance with local hauling load limits. Trucks then proceeded to the unloading area on the west side of the cell, immediately north of the temporary contact water basin. At the unloading area, trucks were directed by ramp attendants to proceed to one of four steel unloading ramps, where the trucks would dump their loads. After unloading, each truck was visually inspected for exterior contamination and evidence of leakage. External surfaces of rucks were also verified radiologically clean by means of LAW before they were allowed to return to the excavation at the $TiCl_4$ plant.

Once material was unloaded into the Landfill, it was placed and graded to design elevations identified in the Waste Placement Plan, Appendix G of the 100% RD. Upon completion of all contaminated waste placement, the extent of contaminated material was recorded by means of a topographic survey and the contaminated material was covered with a minimum of two feet of filter cake, MIC's process waste material. Drawing 4923-117 shows the extent of contaminated material after placement of the material was complete.

During placement of contaminated material, health and safety, and decontamination procedures within the Landfill were similar to that of the excavation. Proper PPE, decontamination procedures, monitoring, etc., were utilized within the Landfill until all contaminated material was covered.

3.9 PRE-FINAL INSPECTION

A majority of the work involved with the RA was completed as of October 15, 1999. As a result, a Pre-Final Inspection was performed by USEPA, ODH, USACE, MIC and MK on October 20, 1999. The Pre-Final Inspection consisted of a brief introductory meeting, a site tour, and a follow-up meeting. The Pre-Final Inspection did not identify any major outstanding issues, but did result in the development of an official punchlist that identified items requiring closeout before the RA would be considered complete by USEPA.

3.10 FINAL INSPECTION

With the completion of all punchlist items, the site received a final inspection performed by USEPA, ODH, USACE, MIC and MK on December 8, 1999. The Final Inspection consisted of an introductory meeting, a site tour, and a follow-up meeting. A majority of the data collected during the RA was presented during the inspection. As a result of the Final Inspection, the RA was considered complete with the exception of the submittal of this CRAR to USEPA and a subsequent review of the data included within it.

4.0
QUALITY ASSURANCE

This section addresses quality assurance procedures used to document the quality of key components while remediating the facility. Quality assurance was performed by MK acting as the engineer providing quality assurance oversight for the owner, MIC. In addition, USACE personnel were present on a daily basis to serve as USEPA's on site representative. All work was performed in accordance with the 100% RD and the RA Work Plan.

4.1 QUALITY ASSURANCE RESPONSIBILITIES

The construction quality assurance (CQA) inspector was responsible for implementing and documenting daily quality assurance items and issues. The CQA inspector interfaced directly with MIC's Project Manager and GLC's Superintendent to coordinate quality assurance issues. **Mr. Jeffrey Kyser of MK was responsible for fulfilling the CQA inspector requirements related to the RA.**

4.2 DOCUMENTATION

This section describes the documentation and record keeping that was used during the RA at the Millennium Plant 2 $TiCl_4$ facility. The documentation designed to assist CQA personnel in meeting the quality assurance objectives and to provide the appropriate documentation and records of the RA. Documentation mainly consisted of the following; CQA Daily Reports, Problem Identification Reports (PIRs), Design Clarifications and photographs. All CQA documentation, with the exception of the photographs, is included in Appendix D.

Upon successful completion of this report, CQA will officially transmit all CQA documentation to the MIC Project Manager to become part of the permanent RA records.

4.2.1 Quality Assurance Daily Summary Report

Quality Assurance Daily Summary Reports were prepared for each day of construction by the CQA inspector. The reports followed the format identified in the Construction Quality Assurance Plan (CQAP), Appendix D of the RA Work Plan. The reports provide the chronologic framework for identifying and recording all major construction activities, inspections and testing.

4.2.2 Problem Identification Reports

In situations where materials or workmanship did not meet the requirements of the design plans or technical specifications, a PIR was issued by CQA personnel. Each PIR was distributed to both MIC and GLC. PIRs were tracked by CQA personnel until the deficiency was corrected and the PIR closed by CQA personnel.

4.2.3 Design Clarifications

Occasionally, unforeseen field conditions were encountered that were not addressed in the design. In these situations, a Design Clarification was drafted and issued to MK, who was responsible for providing field engineering direction. Design clarifications were typically minor modifications to the design. USEPA received both oral and written notification when Design Clarifications were issued.

4.2.4 Photographs

As work progressed, photographs were taken by CQA to document conditions. Some of these photos have been included with this report to better illustrate the highlights and major components of the RA. Photos of the RA are included in Appendix G.

4.3 PROGRESS MEETINGS

Beginning the week of the contractor's mobilization, weekly progress meetings were held at the Landfill trailer. The meetings were typically attended by MIC, GLC, MK, ALMI and USACE. The meetings typically covered:

- a review of the project's safety record and current safety issues/concerns
- a review of the previous week's activities and accomplishments
- a review of GLC's planned work location and activities for the week
- a review of the overall project schedule and any modifications to it
- a review of GLC's performance with respect to quality
- discussion of current and/or potential construction problems

Weekly progress meetings were documented by MIC and the minutes were transmitted to all attending parties.

5.0
HEALTH AND SAFETY

Health and safety during the RA was very successful. A total of 30,000 man-hours were worked on site without a reportable health and safety incident. This achievement was made possible by the strategy used to manage health and safety as well as the personnel who contributed to its implementation. Although the health and safety of all personnel on site was the ultimate responsibility of MIC, the implementation of health and safety was managed in two separate parts; issues associated with PCBs, and issues associated with radioactivity. The following describes health and safety procedures for both the $TiCl_4$ plant excavation and Landfill operations.

5.1 PCB HEALTH AND SAFETY

Health and safety issues associated with PCBs were the responsibility of GLC. GLC employed a full time health and safety officer (HSO) whose job was to remain on site to implement and enforce proper health and safety procedures. The HSO held daily meetings that covered general health and safety concerns associated with the work.

To minimize worker and public exposure to PCBs, GLC set up fencing around the perimeter of the excavation area and established it as an exclusion zone. Mobile decontamination facilities were set up in strategic areas at the limits of the exclusion zone. The decontamination areas served as the primary access point for all personnel and equipment entering the exclusion zone. Prior to entry, all personnel were required to show proof of OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. Upon entry, all personnel were to sign in and don personal protective equipment. Personal protective equipment for all personnel entering the exclusion zone typically consisted of Tyveks, rubber boots and gloves in addition to standard hardhats, steel toed shoes and escape respirators. **Combination respirators for organic vapor and dust were worn in all work areas until air monitoring data indicated that they were not required.** The HSO periodically verified that all personnel were in compliance with exclusion zone requirements such as signing in, wearing proper PPE, and decontaminating properly.

In addition to enforcing health and safety procedures on site, the HSO was also responsible for implementing an air monitoring program to control exposure to potential hazards such as dust or organic vapors. Air monitoring for dust consisted of both perimeter air samples, collected daily around the exclusion zone limits, and personal air monitor (PAM) samples, worn by the worker most likely to receive the highest exposure within the work area. Air monitoring for organic vapors was performed using both a combustible gas indicator and a flame ionization detector. Throughout the project, no measurements in excess of OSHA action levels were encountered for either dust or organic vapor monitoring.

5.2 RADIOLOGICAL HEALTH AND SAFETY

Health and safety issues associated with radioactivity were the responsibility of MK. MK directed a Radiological Control Supervisor (RCS) and several Radiological Control Technicians (RCTs) to control radiological issues. The RCS and RCTs were full time employees. The RCS was responsible for implementing a radiological safety program that was consistent with requirements identified in the RA Work Plan. RCTs were responsible for performing radiological monitoring for equipment release (including trucks), air samples, and grid surveys. RCTs were present during all activities involving soil contaminated with NORM.

PPE and decontamination procedures for radioactive control on site were similar to that of the PCBs, with minor exceptions. Friskers were stationed at decontamination areas for self monitoring of radiological contamination. Each worker who entered the contamination zone was trained to Radiological Worker II standard utilized by the Department of Energy (DOE). This included the basic knowledge of radiation, contamination and controls; and specific methods utilized on this site. Forty four workers received Radiological Worker II training. Nineteen truck drivers received orientation training.

In the RA Work Plan, an As Low As Reasonably Achievable (ALARA) goal of ≤ 50 mrem total exposure was set for personnel involved with the project. All personnel that entered radiologically controlled areas were monitored for both internal and external exposures. The ALARA goal was achieved for all personnel. Following is a description of monitoring procedures.

5.2.1 Thermoluminescent Dosimeters

External exposure was monitored by site surveys and personal monitors (Thermoluminescent Dosimeters [TLDs]) worn by the workers. At the job's completion, TLDs were collected by the RCTs and sent to an independent laboratory for analysis. Laboratory results indicated that one worker received an external exposure of 10 mrem, the lowest detectable limit of the TLD. No other workers were assigned an external dose. A summary of TLD results is included in Appendix F.

5.2.2 Air Monitoring/Bioassays

Worker internal exposure was monitored by routine air sampling and bioassay samples. Air sampling consisted of both perimeter air samples, collected daily around the exclusion zone limits, and personal air monitor (PAM) samples, worn by the worker most likely to receive the highest internal exposure. Air samples were utilized to monitor internal exposure for personnel who entered radiologically controlled areas. No internal dose was assigned to any worker as a result of data collected from air monitors.

Baseline and post-job bioassay samples were analyzed for all workers entering radiological controlled areas. The baseline of radium and thorium present in the urine samples is higher than the sensitivity required to verify the ALARA goal for workers. For this reason bioassay results

were used simply as a check to verify the air sample program. This was performed by evaluating the data sets for baseline and post-job samples to demonstrate that workers have not received a significant internal exposure. Both air monitoring and bioassay results are included in Appendix F.

5.3 OFF-SITE SAFETY ISSUES

As it was explained in Section 5.0, no on site reportable health and safety issues occurred during the project. There were, however, two off-site issues that required evacuation of all RA personnel from the site. The first incident was a fire at the former RMI Sodium Plant on State road, during which, fumes from the fire were windblown over to the work area. The second incident was a release of $TiCl_4$ gas from the MIC Plant 2 TiO_2 Facility, which was also windblown into the work area. GLC personnel that participated in the $TiCl_4$ release evacuation were allowed the option, by GLC, to receive medical surveillance to ensure that no medical treatment was required as a result of the release. Details of these two incidents are not included with this report, however, each of the incidents are on public record. Neither of these incidents were a result of any RA activities.

6.0
CONCLUSIONS AND RECOMMENDATIONS

Successful completion of the enhanced remedy has resulted in the MIC Plant 2 $TiCl_4$ facility being both free of PCB material falling under the jurisdiction of TSCA, and no longer a threat to recontaminate Fields Brook with PCBs or radioactive material. **Additionally, the placement of clean backfill within the excavations of PCBs ≥ 50 mg/kg has further enhanced the cleanup.** As a result of these actions, objectives of the 100% RD, the RA Work Plan, and this CRAR have been met.

The following activities are specifically mentioned in the Section II of the SOW, but are not necessary because the enhanced remedy was performed:

- Institutional Controls: no institutional controls at the $TiCl_4$ facility are necessary. With the removal of the soil to the CUGs, there will be no need for deed restrictions to protect any parts of the property.
- Operation and Maintenance (O&M): no formal O&M is planned because no erosional soil cover was constructed in areas that have the potential to recontaminate Fields Brook. No compliance monitoring or sampling of surface water is necessary.
- Five Year Reviews: in performing the enhanced remedy, Five Year Reviews will not be necessary because recontamination of Fields Brook from the $TiCl_4$ facility is not an issue.

Finally, having met the objectives of the 100% RD, the RA Work Plan and this CRAR, it is recommended that no further remedial action be performed on site and that the MIC, Plant 2, $TiCl_4$ Facility be removed from the list of SCOUs to the Fields Brook Superfund Site.

7.0
REFERENCES

MK, 1999 - *Remedial Action Work Plan.* Prepared by Morrison Knudsen, Rev 0, June, 1999.

MK, 1999 - *100% Remedial Design.* Prepared by Morrison Knudsen, Rev 0, June, 1999.

OEPA, 1999 - *Modification to Permit to Install - Change in Waste Stream, Permit to Install No. 02-12615.* Prepared by Ohio Environmental Protection Agency, June 16, 1999.

USEPA Region V, 1999 - *Explanation of Significant Differences.* Prepared by United States Environmental Protection Agency, Rev. 0, April 12, 1999.

USEPA Region V, 1998 - *Amended Unilateral Administrative Order and Statement of Work.* Prepared by United States Environmental Protection Agency, Rev. 1, February 11, 1998.

USEPA Region V, 1997 - *Unilateral Administrative Order.* Prepared by United States Environmental Protection Agency, Rev. 0, December 24, 1997.

USEPA Region V, 1997 - *Source Control Operable Unit Record of Decision.* Prepared by United States Environmental Protection Agency, Rev. 0, September, 1997.

Woodward-Clyde, 1997 - *Phase I Source Control, Remedial Investigation Final Report.* Prepared by Woodward Clyde, May, 1997.

AquAeTer, Inc., 1997 - *Delineation Sampling Program Results.* Prepared by AquAeTer, Inc. August, 1997.

AquAeTer, Inc., 1996 - *Mining Residuals Pile Volume Investigation.* Prepared by AquAeTer, Inc., December, 1996.

Montgomery Watson, 1995 - *Phase II Environmental Site Assessment,* 343 Acre Ashtabula, Ohio Site. Prepared by Montgomery Watson, March, 1995.

Woodward-Clyde, 1993 - *Draft Source Control Operable Unit Remedial Investigation Report, Phase I, Revision 0.* Prepared by Woodward-Clyde, November, 1993.

The Advent Group, 1992 - *Various letters presenting sample collection data.* Prepared by The Advent Group, January - March, 1992.

The Advent Group, 1991 - *Phase III PCB Source Quantification Investigation.* Prepared by The Advent Group, August, 1991.

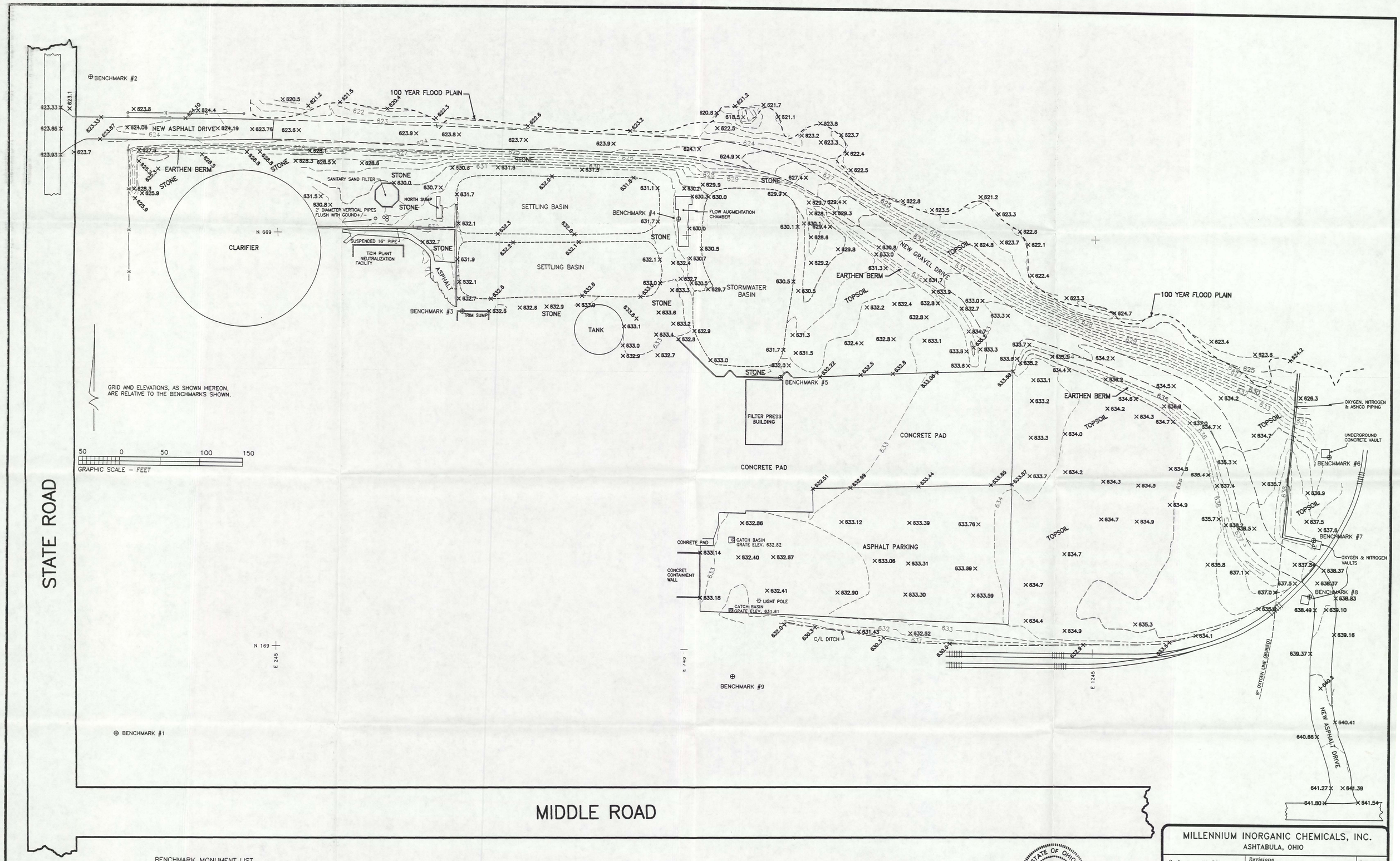
The Advent Group, 1991 - *Phase II PCB Source Quantification Investigation.* Prepared by The Advent Group, March, 1991.

APPENDIX A
AS-BUILT DRAWINGS

APPENDIX A
AS-BUILT DRAWINGS

TABLE OF CONTENTS

DRAWING NO.	TITLE
4923-106	LATERAL EXTENT OF REMEDIAL EXCAVATION, MINING RESIDUALS PILE
4923-107	EXTENT OF REMEDIAL EXCAVATION, MINING RESIDUALS PILE
4923-108	EXTENT OF REMEDIAL EXCAVATION, PLANT PROCESS AREAS
4923-113	MINING RESIDUALS PILE TOPOGRAPHIC SURVEY, FINAL GRADE
4923-114	MINING RESIUALS PILE, FINAL COVER
4923-117	ASBUILT MINING RESIDUAL PILE MATERIAL IN CELL



BENCHMARK MONUMENT LIST

MONUMENT	NORTHING	EASTING	ELEVATION
BENCHMARK #1	60.57	52.11	634.98
BENCHMARK #2	854.81	17.33	623.08
BENCHMARK #3	576.33	470.44	633.12
BENCHMARK #4	689.11	735.16	630.30
BENCHMARK #5	500.41	860.83	633.46
BENCHMARK #6	410.48	1531.15	635.98
BENCHMARK #7	308.14	1513.01	638.17
BENCHMARK #8	239.84	1508.37	638.19
BENCHMARK #9	137.29	805.03	631.78

NOTES:

1.) TOPOGRAPHY, .S SHOWN, WAS OBSERVED DURING A SURVEY CONDUCTED ON 11/15/99AND 11/16/99.

2.) LOCATION OF DO YEAR FLOOD PLAIN, AS DEPICTED HEREON, WAS PROVIDED BY MORRISON KNUDSEN CORPORATION.

3.) PROPOSED FINL GRADES ARE IDENTIFIED ON DRAWING 4293-013 OF THE MILLENNIUM INORGANIC CHEMICAL PLANT 2 , TiCl4 FACILITY, 100% REMEDIAL DESGN DEVELOPED BY MORRISON KNUDSEN.

STATE OF OHIO
Charles E. Sharp
7510
REGISTERED
PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S.#7510

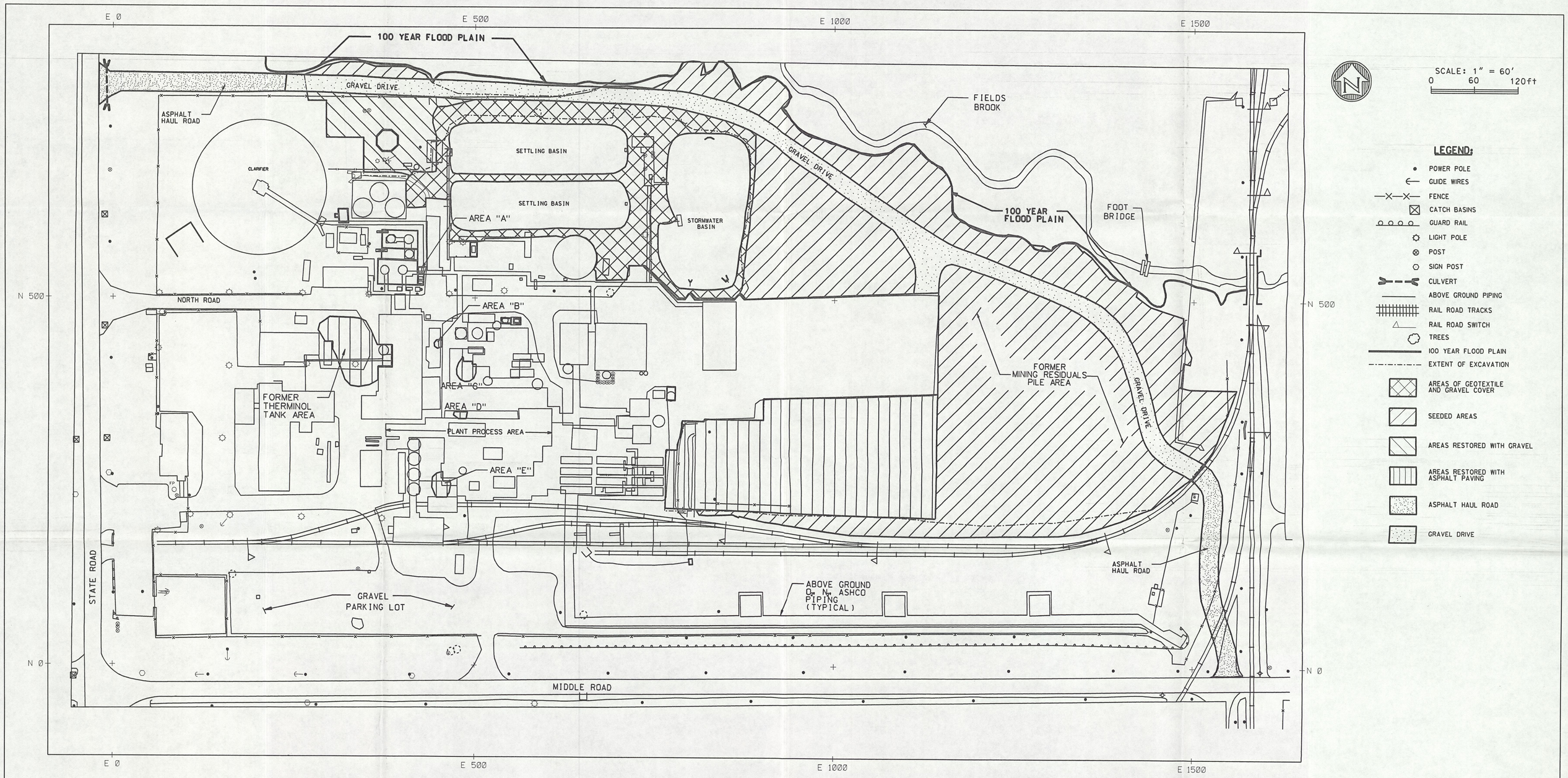
MILLENNIUM INORGANIC CHEMICALS, INC.
ASHTABULA, OHIO

Scale	1"=50'	Revisions	Drawn by:
Date	12/04/99		CES

TOPOGRAPHIC SURVEY
FINAL GRADE

SHARP'S LAND SURVEYING
4141 STATE ROAD SOUTH, ASHTABULA, OHIO
216-992-5878 1-800-322-4851

DWG. NO. 4923-113



STATE OF OHIO
JEFFREY D. KAISER
E-63932
REGISTERED PROFESSIONAL ENGINEER
1/27/00

MORRISON KNUDSEN CORPORATION
ENGINEERING, CONSTRUCTION & ENVIRONMENTAL GROUP
MK-FERGUSON PLAZA
1500 WEST 3RD STREET
CLEVELAND, OHIO 44113-1406
(216) 523-5600

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRV'L LDE	APPROV'L DH	PROJ. ENG.

MILLENNIUM INORGANIC CHEMICALS INC.
ASHTABULA, OHIO

DESIGNED	DRAWN
JO	JF
CHECKED	AB
REVIEWED	JK
RECOMMENDED	JK
APPROVED	DATE 1/27/00

PROJECT MANAGER | DATE | PROJECT ENGINEER | DATE

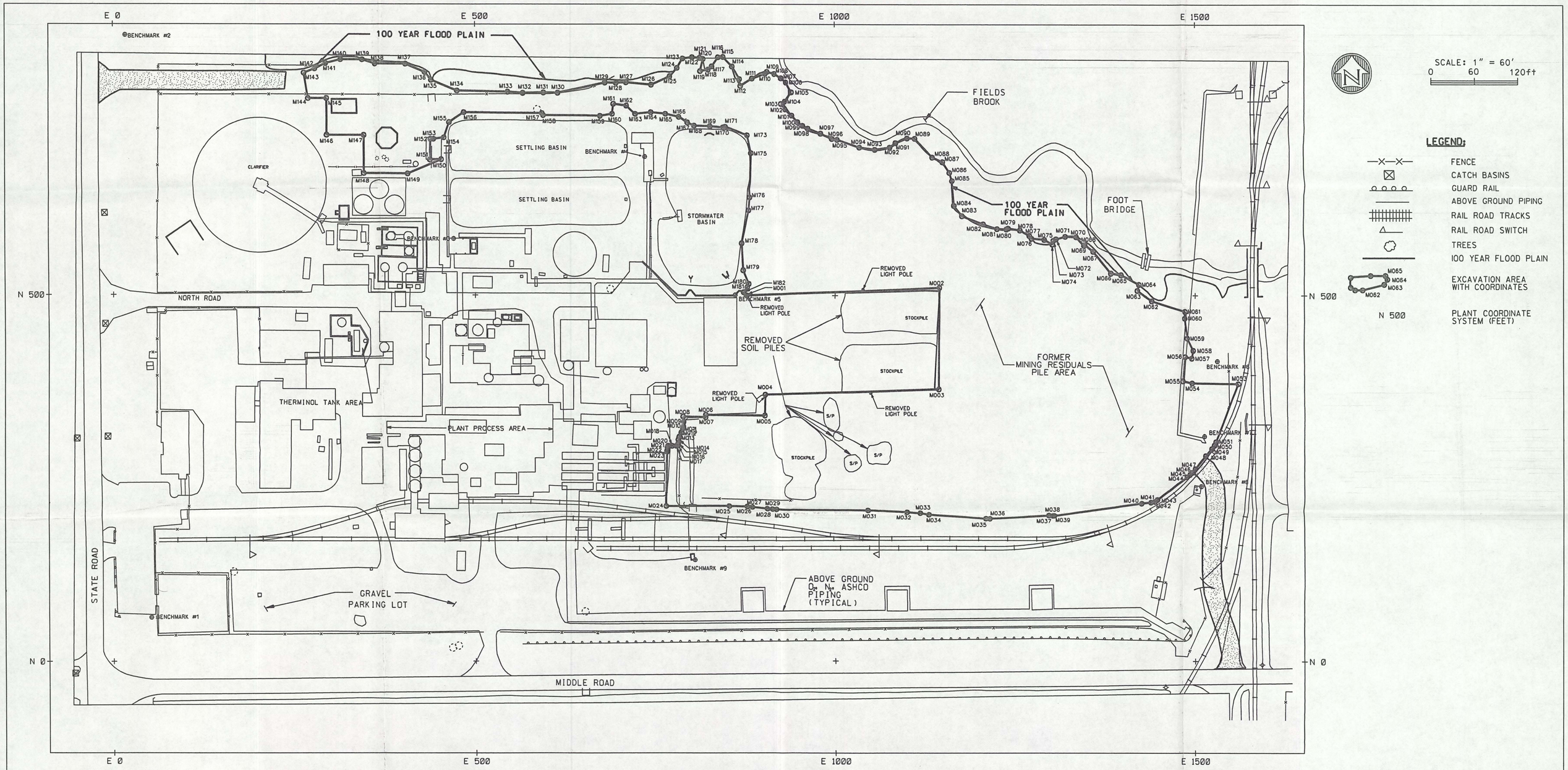
AS-BUILT FINAL COVER

MIC PLANT 2 TICI, FACILITY REMEDIAL ACTION

REFERENCE DRAWINGS:
"TOPOGRAPHIC SURVEY FINAL GRADE", SHARP'S LAND SURVEYING, DRAWING NO. 4923-113 (12/04/99)

PROJECT NO. 4923-08

DRAWING NO. 4923-114 REV. 0



MINING RESIDUAL PILE EXCAVATION COORDINATES

M001 :	(N499.9,E876.7)	M027 :	(N211.3,E884.6)	M053 :	(N379.8,E1559.9)	M079 :	(N590.8,E1239.7)	M105 :	(N777.0,E941.3)	M131 :	(N776.7,E595.0)	M157 :	(N748.7,E592.8)
M002 :	(N510.8,E1144.2)	M028 :	(N208.7,E905.4)	M054 :	(N380.7,E1495.3)	M080 :	(N589.6,E1237.3)	M106 :	(N790.6,E933.2)	M132 :	(N776.0,E566.4)	M158 :	(N746.0,E594.4)
M003 :	(N372.7,E1143.4)	M029 :	(N208.0,E912.4)	M055 :	(N383.5,E1482.1)	M081 :	(N590.3,E1224.3)	M107 :	(N796.2,E926.0)	M133 :	(N777.7,E545.5)	M159 :	(N744.9,E673.6)
M004 :	(N365.3,E902.0)	M030 :	(N207.7,E918.5)	M056 :	(N416.6,E1485.5)	M082 :	(N596.7,E1205.0)	M108 :	(N802.0,E916.1)	M134 :	(N779.0,E475.6)	M160 :	(N747.6,E690.6)
M005 :	(N336.3,E901.6)	M031 :	(N206.4,E1044.7)	M057 :	(N414.6,E1495.2)	M083 :	(N607.9,E1175.5)	M109 :	(N804.6,E905.4)	M135 :	(N793.8,E439.8)	M161 :	(N761.4,E692.3)
M006 :	(N337.3,E819.8)	M032 :	(N203.8,E1098.5)	M058 :	(N425.1,E1497.1)	M084 :	(N621.7,E1164.5)	M110 :	(N802.2,E902.6)	M136 :	(N804.4,E430.9)	M162 :	(N759.0,E710.3)
M007 :	(N334.3,E819.6)	M033 :	(N202.4,E1116.7)	M059 :	(N441.7,E1488.6)	M085 :	(N656.4,E1162.1)	M111 :	(N795.7,E884.7)	M137 :	(N815.6,E403.8)	M163 :	(N747.8,E722.8)
M008 :	(N335.0,E788.3)	M034 :	(N200.2,E1128.7)	M060 :	(N468.8,E1484.7)	M086 :	(N667.8,E1158.4)	M112 :	(N785.8,E868.8)	M138 :	(N815.6,E361.3)	M164 :	(N750.0,E744.6)
M009 :	(N327.9,E789.0)	M035 :	(N194.4,E1208.4)	M061 :	(N478.1,E1485.1)	M087 :	(N682.4,E1148.6)	M113 :	(N794.8,E867.2)	M139 :	(N821.5,E343.6)	M165 :	(N747.7,E784.7)
M010 :	(N321.6,E788.5)	M036 :	(N194.4,E1213.7)	M062 :	(N492.7,E1439.0)	M088 :	(N688.5,E1134.4)	M114 :	(N812.0,E857.1)	M140 :	(N821.5,E314.0)	M166 :	(N743.6,E783.4)
M011 :	(N319.0,E788.0)	M037 :	(N199.0,E1295.3)	M063 :	(N506.7,E1418.5)	M089 :	(N714.2,E1110.3)	M115 :	(N825.1,E844.6)	M141 :	(N816.2,E293.4)	M167 :	(N736.1,E795.3)
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M013 :	(N307.3,E783.0)	M039 :	(N198.6,E1302.7)	M065 :	(N527.8,E1395.7)	M091 :	(N708.1,E1083.5)	M117 :	(N812.3,E829.4)	M143 :	(N803.2,E263.8)	M169 :	(N730.9,E826.7)
M014 :	(N303.5,E781.7)	M040 :	(N216.1,E1423.9)	M066 :	(N530.1,E1381.7)	M092 :	(N702.0,E1075.3)	M118 :	(N807.9,E824.2)	M144 :	(N768.9,E269.4)	M170 :	(N729.0,E844.6)
M015 :	(N297.9,E781.6)	M041 :	(N217.5,E1438.8)	M067 :	(N559.3,E1357.0)	M093 :	(N698.9,E1054.9)	M119 :	(N805.8,E813.4)	M145 :	(N768.9,E294.7)	M171 :	(N730.2,E848.0)
M016 :	(N295.2,E780.9)	M042 :	(N218.5,E1442.2)	M068 :	(N588.4,E1345.1)	M094 :	(N701.9,E1033.6)	M120 :	(N822.4,E817.1)	M146 :	(N719.0,E294.8)	M172 :	< NOT USED >
M017 :	(N294.7,E779.2)	M043 :	(N221.3,E1445.5)	M069 :	(N567.3,E1344.1)	M095 :	(N712.5,E1003.0)	M121 :	(N823.8,E812.3)	M147 :	(N719.0,E345.3)	M173 :	(N718.6,E877.5)
M018 :	(N294.9,E773.2)	M044 :	(N252.7,E1487.2)	M070 :	(N579.1,E1333.4)	M096 :	(N713.8,E995.7)	M122 :	(N824.9,E802.0)	M148 :	(N666.7,E345.3)	M174 :	< NOT USED >
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M020 :	(N294.7,E767.0)	M046 :	(N258.8,E1495.2)	M072 :	(N576.2,E1305.6)	M098 :	(N727.7,E963.4)	M124 :	(N810.3,E781.2)	M150 :	(N685.3,E453.6)	M176 :	(N632.9,E881.2)
M021 :	(N293.5,E766.6)	M047 :	(N263.8,E1499.8)	M073 :	(N574.0,E1301.7)	M099 :	(N731.6,E956.5)	M125 :	(N798.6,E770.7)	M151 :	(N685.2,E438.0)	M177 :	(N615.0,E879.2)
M022 :	(N288.3,E765.9)	M048 :	(N281.6,E1514.7)	M074 :	(N569.0,E1300.5)	M100 :	(N736.3,E949.9)	M126 :	(N787.3,E744.8)	M152 :	(N713.5,E438.4)	M178 :	(N570.3,E869.8)
M023 :	(N286.8,E765.8)	M049 :	(N291.3,E1523.2)	M075 :	(N575.4,E1289.5)	M101 :	(N745.3,E942.0)	M127 :	(N790.5,E709.5)	M153 :	(N713.4,E442.7)	M179 :	(N534.1,E871.8)
M024 :	(N212.2,E764.5)	M050 :	(N295.7,E1526.8)	M076 :	(N577.1,E1271.9)	M102 :	(N753.9,E932.3)	M128 :	(N789.8,E695.6)	M154 :	(N715.5,E457.2)	M180 :	(N515.7,E879.5)
M025 :	(N212.6,E852.6)	M051 :	(N300.4,E1528.9)	M077 :	(N580.8,E1268.8)	M103 :	(N761.3,E926.3)	M129 :	(N790.2,E680.3)	M155 :	(N736.5,E464.4)	M181 :	(N511.3,E877.3)
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BENCHMARK MONUMENT LIST

MONUMENT	SITE COORDINATES NORTHING	SITE COORDINATES EASTING	ELEVATION	STATE PLANAR COORDINATES NORTHING	STATE PLANAR COORDINATES EASTING
BENCHMARK #1	60.57	52.11	634.98	814935.4	2470410.8
BENCHMARK #2	854.81	17.33	623.08	815729.4	2470369.5
BENCHMARK #3	576.33	470.44	633.12	815454.6	2470824.9
BENCHMARK #4	689.11	735.16	630.30	815569.6	2471088.6
BENCHMARK #5	500.41	860.63	633.46	815382.0	2471215.7
BENCHMARK #6	410.48	1531.15	635.98	815297.6	2471886.9
BENCHMARK #7	308.14	1513.01	638.17	815195.1	2471869.6
BENCHMARK #8	239.84	1508.37	638.19	815126.8	2471865.5
BENCHMARK #9	137.29	805.03	631.78	815018.4	2471163.1

STATE OF OHIO JEFFREY D. KIRK 61918 REGISTERED PROFESSIONAL ENGINEER

1/27/00

MORRISON KNUDSEN CORPORATION
ENGINEERING, CONSTRUCTION
& ENVIRONMENTAL GROUP
MK-FERGUSON PLAZA
1500 WEST 3RD STREET
CLEVELAND, OHIO 44113-1406
(216) 523-5600

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRV'L LDE	APPROV'L DH	PROJ. ENG.

MILLENNIUM INORGANIC CHEMICALS INC.
ASHTABULA, OHIO

DESIGNED JO | DRAWN JF
CHECKED AB
REVIEWED JK
RECOMMENDED JK
APPROVED — DATE 1/27/00

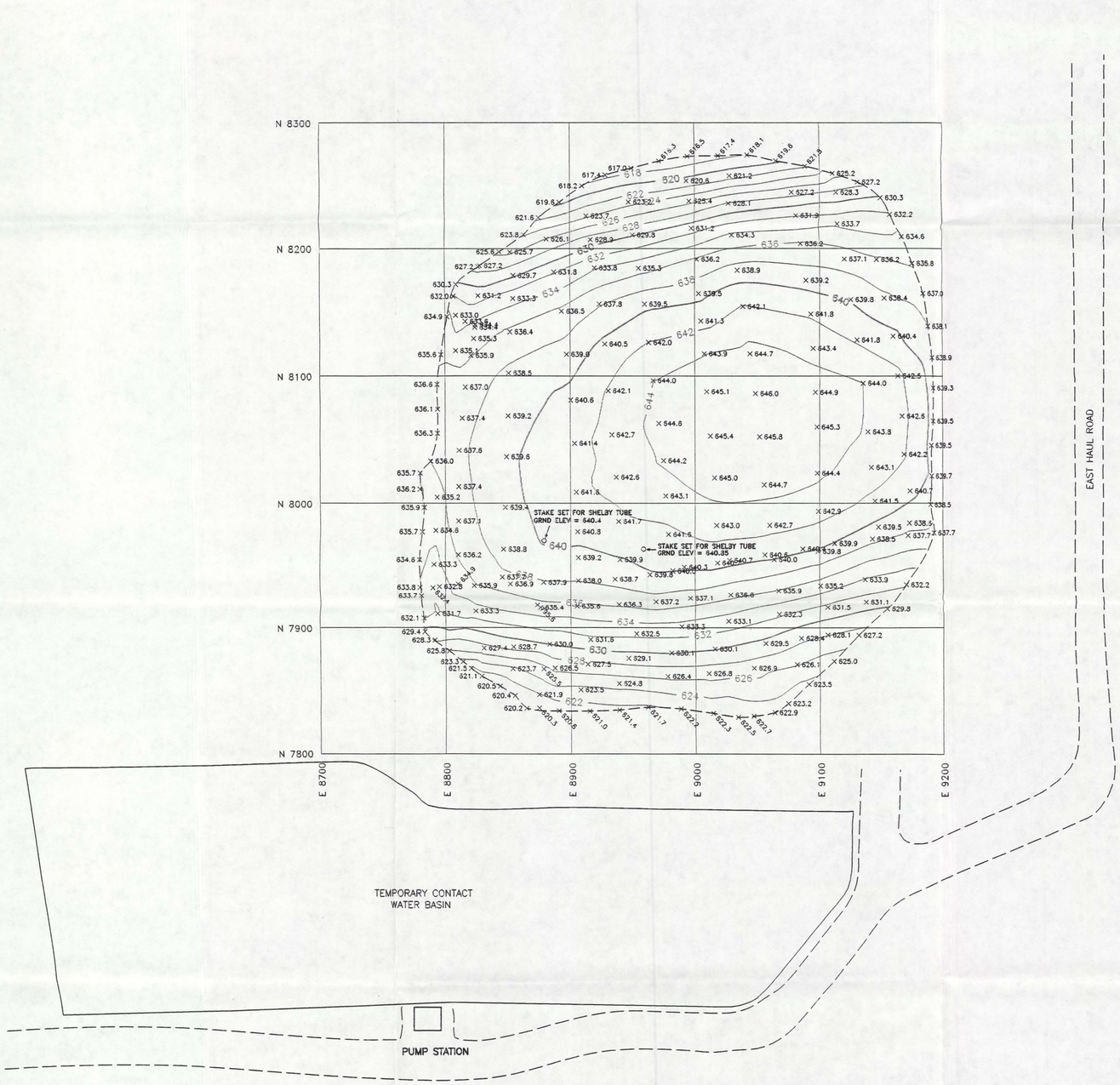
MINING RESIDUALS PILE FINAL EXCAVATION COORDINATES

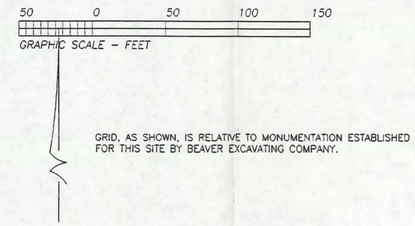
MIC PLANT 2 TICL FACILITY REMEDIAL ACTION

PROJECT MANAGER | DATE | PROJECT ENGINEER | DATE

REFERENCE DRAWINGS:
"EXTENT OF REMEDIAL EXCAVATION, MINING RESIDUAL PILE", SHARP'S LAND SURVEYING, DRAWING NO. 4923-107 (12/04/99)

PROJECT NO. 4923-08
DRAWING NO. 4923-106
REV. 0





GRID, AS SHOWN, IS RELATIVE TO MONUMENTATION ESTABLISHED FOR THIS SITE BY BEAVER EXCAVATING COMPANY.

NOTES:

1.) DATA,FROM WHICH THE TOPOGRAPHY SHOWN, WAS GATHERED ON 11/01/99.

2.) ELEVATIONS AND CONTOURS SHOWN ARE RELATIVE TO MONUMENTS ESTABLISHED BY BEAVER EXCAVATING COMPANY AND ARE AS FOLLOWS:

BRONZE DISC IN CONCRETE HEADWALL AT MIDDLE ROAD ENTRANCE
N-8359.575
E-7459.525
ELEV.= 641.50

5/8" DIAMETER REBAR AT NORTH END OF EAST CELL
N-8956.65
E-9114.205
ELEV.= 637.90

BRONZE DISC IN CONCRETE HEADWALL AT SOUTH END OF SEDIMENTATION BASIN
N-8822.165
E-9433.295
ELEV.= 639.71

STATE OF OHIO
Charles E. Sharp
7510
REGISTERED
PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S.#7510

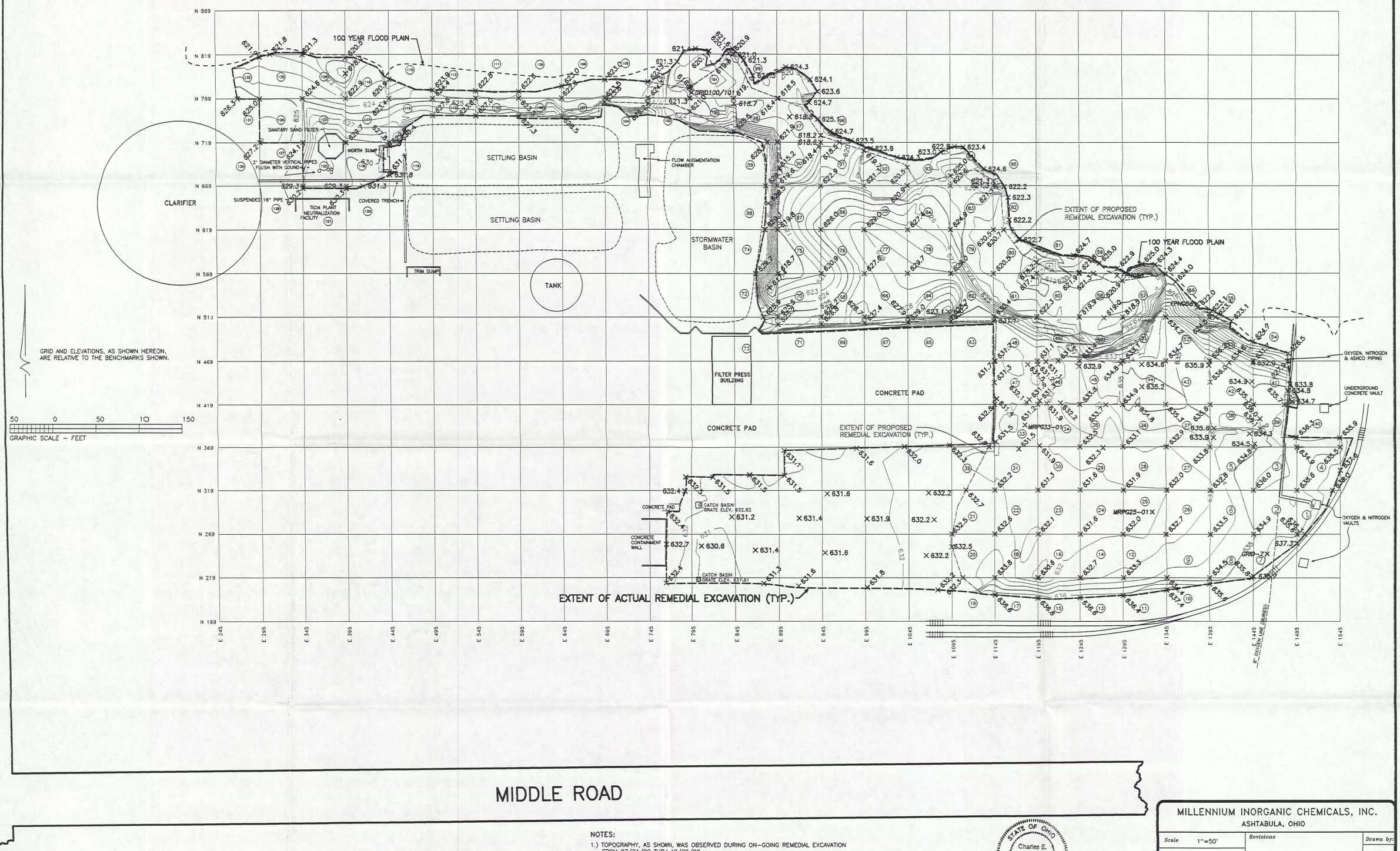
MILLENNIUM INORGANIC CHEMICALS
ASHTABULA LANDFILL
ASHTABULA TOWNSHIP, ASHTABULA CO., OHIO

Scale	1"=50'	Revisions	Drawn by:
Date	11/23/99		CES

ASBUILT
MINING RESIDUAL PILE MATERIAL
IN CELL

SHARP'S LAND SURVEYING
4141 STATE ROAD SOUTH, ASHTABULA, OHIO
216-992-5878 1-800-322-4851

DWG NO. 4923-117



NOTES:

1.) TOPOGRAPHY, AS SHOWN, WAS OBSERVED DURING ON-GOING REMEDIAL EXCAVATION FROM 07/21/99 THRJ 10/29/99.

2.) LOCATION OF 100 YEAR FLOOD PLAIN, AS DEPICTED HEREON, WAS PROVIDED BY MORRISON KNUDSON CORPORATION.

3.) DESIGN EXCAVATION EXTENTS ARE IDENTIFIED ON DRAWING 4923-007 OF THE MILLENNIUM INORGANIC CHEMICALS PLANT 2, $TiCl_4$ FACILITY, 100% REMEDIAL DESIGN DEVELOPED BY MORRISON KNUDSEN.

(12) EXCAVATION GRID NUMBER

STATE OF OHIO
Charles E. Sharp
7510
REGISTERED PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S.#7510

MILLENNIUM INORGANIC CHEMICALS, INC.
ASHTABULA, OHIO

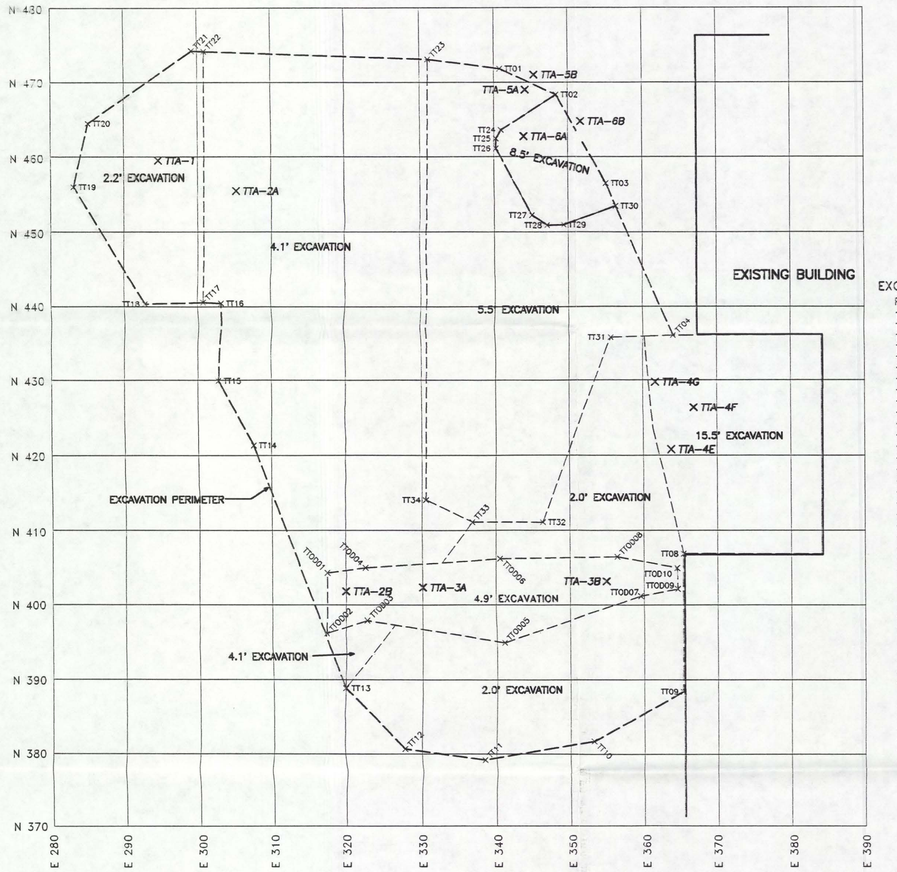
Scale	1"=50'	Revisions	Drawn by:
Date	12/04/99		CES

EXTENT OF REMEDIAL EXCAVATION
MINING RESIDUAL PILE

SHARP'S LAND SURVEYING
4141 STATE ROAD SOUTH, ASHTABULA, OHIO
216-992-5878 1-800-322-4851

DWG. NO. 4923-107

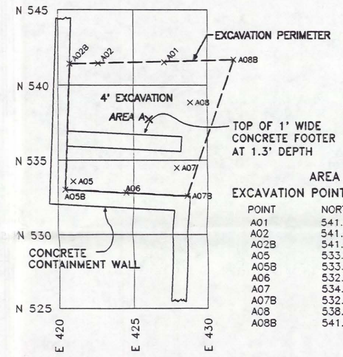
THERMINOL TANK AREA
1"=10'



THERMINOL TANK AREA
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
TT01	471.8	340.8
TT02	468.4	348.4
TT03	456.5	355.1
TT04	436.1	364.1
TT08	406.9	365.4
TT09	388.4	365.3
TT10	381.8	353.2
TT11	379.2	338.4
TT12	380.7	327.7
TT13	388.9	320.0
TT14	421.3	307.6
TT15	429.9	302.8
TT16	440.5	303.2
TT17	440.6	300.8
TT18	440.4	292.8
TT19	456.0	283.1
TT20	464.5	285.1
TT21	474.2	299.2
TT22	474.2	300.9
TT23	473.1	331.1
TT24	463.6	341.0
TT25	462.4	340.3
TT26	461.1	340.3
TT27	452.2	345.1
TT28	450.9	347.1
TT29	450.9	349.4
TT30	453.4	356.4
TT31	435.8	355.7
TT32	411.1	346.3
TT33	411.1	336.7
TT34	414.1	330.5
TTOD01	404.3	317.5
TTOD02	396.2	317.4
TTOD03	398.0	322.7
TTOD04	405.0	322.6
TTOD05	395.0	341.0
TTOD06	406.2	340.6
TTOD07	401.2	359.5
TTOD08	406.4	356.4
TTOD09	402.1	364.6
TTOD10	404.9	364.5

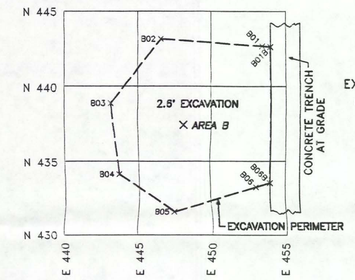
AREA "A"
1"=5'



AREA "A"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
A01	541.5	427.1
A02	541.4	422.6
A02B	541.4	420.3
A05	533.6	421.0
A05B	533.0	420.5
A06	532.8	424.5
A07	534.5	427.9
A07B	532.6	428.6
A08	538.8	428.8
A08B	541.7	431.8

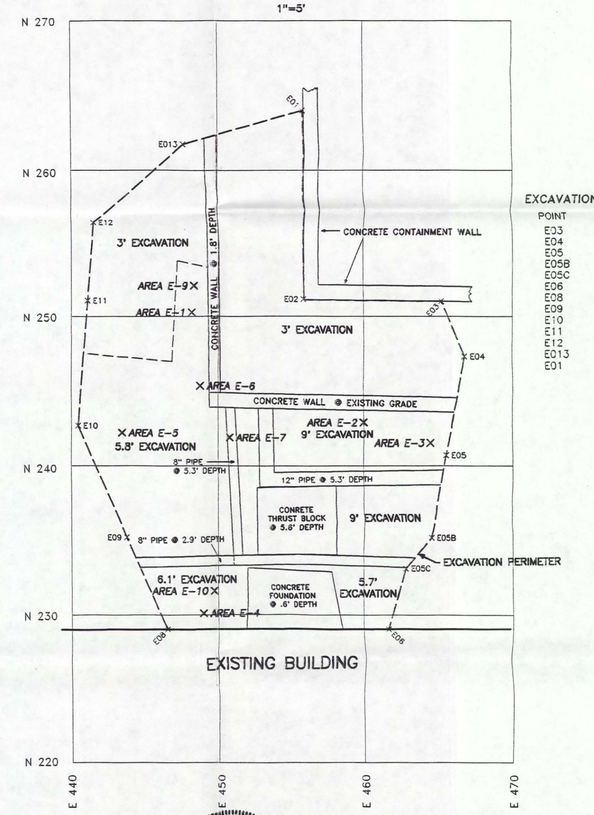
AREA "B"
1"=5'



AREA "B"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
B01	442.7	453.4
B01B	442.6	454.0
B02	443.1	446.6
B03	438.9	443.1
B04	434.1	443.7
B05	431.6	447.4
B06	433.3	453.0
B06B	433.5	454.0

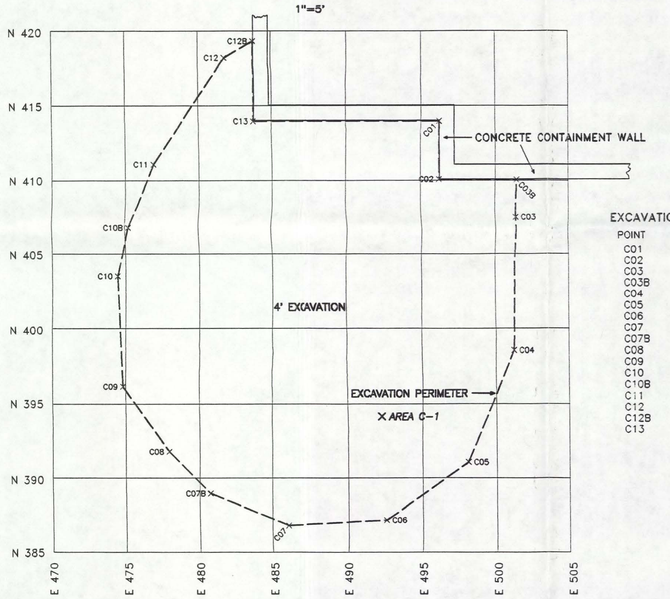
AREA "E"
1"=5'



AREA "E"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
E03	251.0	465.3
E04	247.4	466.9
E05	240.7	465.6
E05B	235.2	464.6
E05C	233.1	462.8
E06	229.0	461.7
E08	229.0	446.5
E09	235.2	443.8
E10	242.7	440.5
E11	251.1	441.1
E12	256.4	441.5
E013	261.8	447.7
E01	264.0	455.9

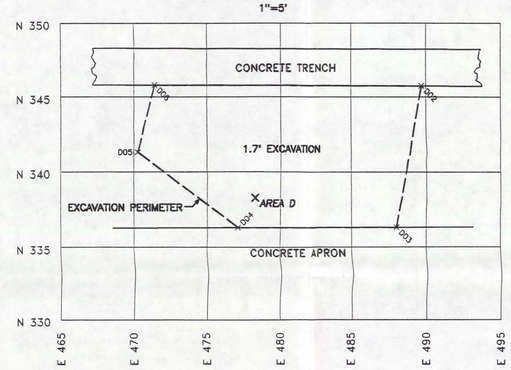
AREA "C"
1"=5'



AREA "C"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
C01	414.0	496.2
C02	410.1	496.2
C03	407.5	501.4
C03B	410.1	501.4
C04	398.5	501.2
C05	391.1	498.1
C06	387.2	492.5
C07	386.8	486.1
C07B	389.0	480.7
C08	391.8	477.9
C09	396.2	474.8
C10	403.5	474.4
C10B	406.8	475.2
C11	411.1	476.9
C12	418.2	481.8
C12B	419.3	483.8
C13	414.0	483.7

AREA "D"
1"=5'



AREA "D"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
D02	345.7	489.7
D03	336.3	488.0
D04	336.3	477.1
D05	341.3	470.3
D06	345.8	471.4

NOTE: DESIGN EXCAVATION EXTENTS ARE IDENTIFIED ON DRAWING 4923-008 OF THE MILLENNIUM INORGANIC CHEMICALS PLANT 2, $TiCL_4$ FACILITY, 100% REMEDIAL DESIGN DEVELOPED BY MORRISON KNUDSEN.

STATE OF OHIO
Charles E. Sharp
7510
REGISTERED PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S.#7510

MILLENNIUM INORGANIC CHEMICALS, INC.
ASHTABULA, OHIO

Scale	VARIES	Revisions	Drawn by:
Date	12/07/99		CES

EXTENT OF REMEDIAL EXCAVATION
PLANT PROCESS AREAS

SHARP'S LAND SURVEYING
4141 STATE ROAD SOUTH, ASHTABULA, OHIO
216-992-5878 1-800-322-4851

DWG NO. 4923-108

APPENDIX B
ANALYTICAL RESULTS

APPENDIX B
ANALYTICAL RESULTS

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SUMMARY OF 21-DAY RADIOLOGICAL RESULTS

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
1 North	990827606	8/27/99	1.4	1.2	2.6
2 East	990726602	7/26/99	0.9	0.7	1.6
2 West	990726601	7/26/99	1.7	1.5	3.2
2 /3	990827603	8/27/99	0.8	0.7	1.5
3 West	990803601	8/3/99	1.1	1.2	2.3
4 North	990827605	8/27/99	1.1	0.9	2.0
4 South	990827607	8/27/99	1.0	1.0	2.0
5 North	990803602	8/3/99	1.1	0.8	1.9
5 South	990729601	7/29/99	0.9	0.7	1.6
6 North	990729602	7/29/99	1.1	1.0	2.1
6 South	990730603	7/30/99	1.2	1.1	2.3
7	990729603	7/29/99	1.3	1.2	2.5
8 North	990730602	7/30/99	1.3	1.4	2.7
8 South	990730601	7/30/99	1.1	1.5	2.6
9 North	990806602	8/6/99	1.2	1.1	2.3
9 South	990807601	8/7/99	1.3	1.3	2.6
10 North	990807602	8/7/99	1.2	1.1	2.3
11 North	990807603	8/7/99	1.0	0.9	1.9
12 North	990812607	8/12/99	1.2	1.2	2.4
12 South	990807604	8/7/99	1.1	1.0	2.1
13	990819605	8/19/99	0.8	0.7	1.5
14 East	990817605	8/17/99	1.0	1.0	2.0
14 West	990819606	8/19/99	1.0	1.1	2.1
15	990830603	8/30/99	1.0	0.9	1.9
16 West	990830604	8/30/99	1.1	1.2	2.3
16 East	990824603	8/24/99	1.0	1.7	2.7
17	990903606	9/3/99	0.9	1.2	2.1
18 East	990901602	9/1/99	1.1	1.2	2.3
18 West	990903605	9/3/99	1.1	1.4	2.5
19	990908605	9/8/99	1.1	1.1	2.2
20 West	990908606	9/8/99	1.3	1.2	2.5
20 East	990908607	9/8/99	1.1	1.4	2.5
21 East	990909602	9/9/99	1.0	0.8	1.8
21 West	990909603	9/9/99	1.0	1.3	2.3
22 East	990902601	9/2/99	1.0	1.5	2.5
22 West	990907601	9/7/99	1.2	1.2	2.4
23 West	990830605	8/30/99	1.1	1.2	2.3
23 East	990827601	8/27/99	1.2	1.5	2.7
24 East	990817606	8/17/99	1.0	1.2	2.2

* Non-Radiological area, no sample collected.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
24 West	990823601	8/23/99	1.1	1.1	2.2
25 East	990812606	8/12/99	1.0	1.4	2.4
25 W (SE 1/2)	990812609	8/12/99	1.1	1.3	2.4
25 West (NW 1/2)	990817604	8/17/99	1.0	1.1	2.1
26 North	990804603	8/4/99	1.0	1.1	2.1
26 South	990806601	8/6/99	1.0	0.9	1.9
27 N.W.	990810602	8/10/99	1.2	1.4	2.6
27 S.E.	990804602	8/4/99	1.1	1.2	2.3
28 E (SE 1/2)	990812608	8/12/99	1.1	1.2	2.3
28 East (NW 1/2)	990816605	8/16/99	2.3	2.1	4.4
28 West	990817602	8/17/99	1.1	1.2	2.3
29 East	990819604	8/19/99	1.4	1.4	2.8
29 West	990823602	8/23/99	1.2	1.4	2.6
30 West	990831601	8/31/99	1.0	1.1	2.1
30 East	990827604	8/27/99	1.1	1.1	2.2
31 East	990902603	9/2/99	1.1	1.2	2.3
31 West	990907602	9/7/99	1.2	1.1	2.3
32 East	990910601	9/10/99	1.3	1.3	2.6
33 East	990903604	9/3/99	1.0	1.0	2.0
33 West	990908601	9/8/99	1.1	1.0	2.1
34 West	990831602	8/31/99	1.0	1.0	2.0
34 East	990828601	8/28/99	1.0	1.1	2.1
35 East	990818606	8/18/99	1.2	1.1	2.3
35 West	990824601	8/24/99	1.0	0.9	1.9
36 East	990817601	8/17/99	1.2	1.3	2.5
36 West (SE 1/2)	990817603	8/17/99	1.2	1.3	2.5
36 West (NW 1/2)	990818603	8/18/99	1.2	1.0	2.2
37 S.E.	990810601	8/10/99	1.1	1.1	2.2
37 NW	990816606	8/16/99	1.1	1.0	2.1
38 North	990809603	8/9/99	1.1	0.8	1.9
38 South	990804601	8/4/99	1.1	0.8	1.9
39 West	990809601	8/9/99	1.1	1.1	2.2
39 /40	990827603	8/27/99	0.8	0.8	1.6
39 East	991020601	10/20/99	5.5	2.3	7.8
40 North	990929602	9/29/99	2.0	1.0	3.0
41	990812604	8/12/99	1.1	1.1	2.2
41 East	991020602	10/20/99	1.5	1.4	2.9
42 North	990818604	8/18/99	1.0	1.0	2.0
42 South	990812611	8/12/99	1.8	1.9	3.7

* Non-Radiological area, no sample collected.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
43 East	990813603	8/13/99	1.2	0.9	2.1
43 West	990813605	8/13/99	1.2	0.9	2.1
44 East	990816601	8/16/99	1.4	1.6	3.0
44 West	990819601	8/19/99	1.2	0.9	2.1
45 East	990824602	8/24/99	1.3	1.2	2.5
45 West	990828604	8/28/99	1.1	1.1	2.2
46 East	990902602	9/2/99	1.2	1.0	2.2
46 West	990909601	9/9/99	1.1	1.2	2.3
47 East	990911601	9/11/99	1.4	1.3	2.7
47 West	990915602	9/15/99	1.4	1.1	2.5
48 West	990916601	9/16/99	1.1	1.2	2.3
48 East	990921602	9/21/99	3.2	2.1	5.3
49 East	990920601	9/20/99	1.1	1.2	2.3
49 West	990921601	9/21/99	1.2	1.0	2.2
50 East	990915601	9/15/99	1.5	1.4	2.9
50 West	990918601	9/18/99	1.1	1.0	2.1
51 East	990901601	9/1/99	1.7	1.6	3.3
51 West	990908604	9/8/99	1.3	1.1	2.4
52 South	990830601	8/30/99	1.5	1.3	2.8
52 North	990830602	8/30/99	2.9	2.3	5.2
53 East	990828602	8/28/99	1.2	1.0	2.2
53 West	990828603	8/28/99	1.1	1.2	2.3
54	990812605	8/12/99	1.8	1.8	3.6
54 N.E.	990929601	9/29/99	1.7	1.3	3.0
56	990903601	9/3/99	1.2	1.2	2.4
57 East	990908602	9/8/99	2.3	1.4	3.7
57 West	990908603	9/8/99	1.1	1.0	2.1
58 North	990913601	9/13/99	1.0	1.0	2.0
58 South	990914601	9/14/99	1.2	1.0	2.2
60 East	990918602	9/18/99	1.0	1.0	2.0
60 West	990922602	9/22/99	1.4	1.4	2.8
61 East	991001601	10/1/99	1.1	1.0	2.1
61 West	991001602	10/1/99	1.6	1.5	3.1
62 West	991002602	10/2/99	1.2	1.1	2.3
62 East	991002601	10/2/99	2.1	2.1	4.2
63 North	991005601	10/5/99	1.2	0.8	2.0
64 South	991004601	10/4/99	1.2	1.2	2.4
64 North	991004602	10/4/99	1.3	1.3	2.6
65 North	991005602	10/5/99	1.4	1.3	2.7

* Non-Radiological area, no sample collected.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
66 South	991008607	10/8/99	1.3	1.2	2.5
66 North	991008609	10/8/99	1.4	1.2	2.6
67 North	991008608	10/8/99	1.3	1.0	2.3
68 South	991008606	10/8/99	1.2	1.2	2.4
68 North	991008615	10/8/99	1.2	1.4	2.6
69 North	991008605	10/8/99	1.2	1.2	2.4
70 South	991008604	10/8/99	1.1	1.3	2.4
70 North	991011601	10/8/99	1.0	1.3	2.3
71 North	991008603	10/8/99	1.1	1.2	2.3
72 East	991008602	10/8/99	1.2	1.2	2.4
73 N.E.	991022607	10/23/99	1.0	1.0	2.0
73 Under Cement	991028601	10/8/99	1.3	1.4	2.7
74 East (East 1/2)	991015616	10/15/99	1.4	1.3	2.7
74 East (West 1/2)	991022604	10/22/99	1.8	1.5	3.3
75 North	991008613	10/8/99	1.2	1.4	2.6
75 South	991008617	10/8/99	1.1	1.3	2.4
76 North	991008612	10/8/99	1.2	1.1	2.3
76 South	991008614	10/8/99	1.0	1.1	2.1
77 South	991008610	10/8/99	1.6	1.4	3.0
77 North	991008611	10/8/99	1.2	1.1	2.3
78 South	991004604	10/4/99	0.9	0.9	1.8
78 North	991004605	10/5/99	2.5	3.5	6.0
79 East	991001605	10/1/99	1.1	1.0	2.1
79 West	991001606	10/1/99	2.4	2.6	5.0
80 South	991001603	10/1/99	1.1	1.2	2.3
80 North	991001604	10/1/99	0.9	0.9	1.8
81	990927601	9/27/99	1.0	1.1	2.1
82 South (West 1/2)	991002603	10/2/99	0.9	0.8	1.7
82 N.W.	991012601	10/12/99	1.1	1.0	2.1
83 South	991001607	10/1/99	1.2	1.1	2.3
83 North	991022603	10/22/99	1.1	1.2	2.3
84 South	991005603	10/5/99	1.3	1.3	2.6
84 North	991012604	10/12/99	1.5	1.7	3.2
85 S.W.	991011604	10/11/99	1.2	1.1	2.3
85 N.E.	991012602	10/12/99	1.4	1.6	3.0
86 South	991011602	10/11/99	1.1	1.2	2.3
86 North	991011605	10/11/99	1.2	1.2	2.4
87 South	991011603	10/11/99	1.1	1.4	2.5
87 North	991011606	10/11/99	1.3	1.3	2.6

* Non-Radiological area, no sample collected.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
88 East (East 1/2)	991015615	10/15/99	1.3	1.1	2.4
88 East (West 1/2)	991022605	10/22/99	1.6	1.3	2.9
89 East (East 1/2)	991015614	10/15/99	1.9	1.6	3.5
89 East (West 1/2)	991022608	10/22/99	1.9	1.5	3.4
90 North	991015612	10/15/99	0.9	1.0	1.9
90 South	991015613	10/15/99	1.0	1.0	2.0
91 South	991015610	10/15/99	1.2	1.1	2.3
91 North	991015611	10/15/99	1.1	1.3	2.4
92 East	991013601	10/13/99	1.3	1.8	3.1
92 West	991013602	10/13/99	1.0	1.0	2.0
93 East	991012607	10/12/99	1.3	1.4	2.7
93 West	991012608	10/12/99	1.1	0.9	2.0
94 S.E.	991012605	10/12/99	1.2	1.1	2.3
94 N.W.	991012606	10/12/99	1.1	1.2	2.3
95 S.W.	991012603	10/12/99	1.2	1.1	2.3
96	991022602	10/22/99	0.9	0.9	1.8
97 West	991015605	10/15/99	0.8	0.8	1.6
97 East	991015608	10/15/99	0.9	1.1	2.0
98 West	991015601	10/15/99	1.4	1.1	2.5
98 East	991015603	10/15/99	1.4	1.4	2.8
99 West	991015602	10/15/99	1.0	0.9	1.9
99 East	991015606	10/15/99	0.9	1.0	1.9
99A South	991015607	10/15/99	0.9	0.9	1.8
99A North	991018601	10/18/99	0.8	1.1	1.9
100 North	990903602	9/3/99	5.8	2.3	8.1
101 South	990903603	9/3/99	1.4	1.2	2.6
101 /103	991021601	10/21/99	1.1	1.0	2.1
102 /103	990819603	8/19/99	5.3	1.4	6.7
102 N./103 S.	991022601	10/22/99	1.4	1.1	2.5
104 /105	990818605	8/18/99	1.4	1.2	2.6
106	990818601	8/18/99	3.7	2.8	6.5
107	990818602	8/18/99	2.1	1.4	3.5
108	990816604	8/16/99	1.8	1.5	3.3
109	990816603	8/16/99	3.0	2.4	5.4
110 /111	990816602	8/16/99	1.8	1.5	3.3
112 /113	990813601	8/13/99	2.0	1.7	3.7
114	990813602	8/12/99	1.3	1.3	2.6
115	990811602	8/11/99	1.7	1.3	3.0
116 East	990811601	8/11/99	1.4	1.5	2.9

* Non-Radiological area, no sample collected.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
21-Day Radiological Sample Results

Grid	Sample ID	Date	Ra-226	Ra-228	Total Ra
116 West	990809604	8/9/99	1.2	1.3	2.5
117 East	990812602	8/12/99	1.8	1.2	3.0
117 West	990812601	8/12/99	1.4	1.2	2.6
118	*	8/11/99	*	*	
122 East	*	8/11/99	*	*	
122 West	*	8/10/99	*	*	
123	*	8/10/99	*	*	
124	*	8/4/99	*	*	
125	*	8/2/99	*	*	
126 East	*	8/4/99	*	*	
126 West	*	8/3/99	*	*	
132	*	8/2/99	*	*	

* Non-Radiological area, no sample collected.

21-DAY RADIOLOGICAL RESULTS

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
14-Sep-99	99257209	990809601	39 West	1606.8	1.1	14%	1.1	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257210	990812604	Grid 41	1598.3	1.1	14%	1.1	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257211	990816603	Grid 109	1313.6	3.0	12%	2.4	20%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257212	990807603	11 North	1450.5	1.0	14%	0.9	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257213	990730603	6 South	1420.3	1.2	14%	1.1	24%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257214	990807602	10 North	1455.9	1.3	13%	1.2	22%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257216	990806601	26 South	1799.8	1.0	13%	0.9	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257217	990810602	27 NW	1495.9	1.2	15%	1.4	22%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257218	990803601	3 West	1468.6	1.1	14%	1.2	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
14-Sep-99	99257219	990803602	5 North	1474.4	1.1	13%	0.8	30%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED OCT 12 1999

filename MIL2572.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 14-Sep-99
Julian Date	: 257
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992572s2	0.7028 uCi	0.6860 uCi	2.4%
Closing =>	992572s3	0.7028 uCi	0.6860 uCi	2.4%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99257207

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05128 uCi	0.05652 uCi	91%
Cs-137	0.04514 uCi	0.04712 uCi	96%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99257208
Weight used (g) : 1508.4
Live Time (s) : 900

Replicate filenames : 1a) 99257210
1b) 99257215

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.013 pCi/g	< 0.030 pCi/g
Replicate 1a	1.1 pCi/g	1.1 pCi/g
Replicate 1b	1.2 pCi/g	0.8 pCi/g
RPD 1	9%	32%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

filename : MIL2572S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
15-Sep-99	99258204	990807604	12 South	1552.1	1.1	12%	1.0	28%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258205	990812602	117 East	1512.0	1.8	12%	1.2	23%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258206	990730601	8 South	1532.6	1.1	14%	1.5	21%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258207	990812601	117 West	1473.3	1.4	13%	1.2	22%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258208	990730602	8 North	1339.3	1.3	14%	1.4	23%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258210	990729601	5 South	1543.2	0.9	13%	0.7	24%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258211	990809603	38 North	1404.5	1.1	14%	0.8	27%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258212	990811602	Grid 115	1455.3	1.7	13%	1.3	23%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258213	990804603	26 N	1652.2	1.0	14%	1.1	22%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258214	990804601	38 South	1497.7	1.1	16%	0.8	26%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258215	990726601	2 West	1375.9	1.7	13%	1.5	22%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258216	990813601	Grid112\113	1418.8	2.0	13%	1.7	19%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258217	990816605	NW 1/2 Cor 28 E	1590.4	2.3	12%	2.1	21%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258218	990729602	6 North	1495.2	1.1	13%	1.0	24%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258219	990812605	Grid 54	1364.6	1.8	12%	1.8	21%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258220	990715	07/15/99	1234.1	6.4	11%	8.1	16%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258221	990811601	Grid116East	1407.5	1.4	13%	1.5	22%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258222	990813603	43 East *	1591.8	1.2	14%	0.9	28%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)
15-Sep-99	99258223	990817602	Grid28West	1544.4	1.1	16%	1.2	22%	pCi/g	2	Millennium Excavation(Dried)(Recount after hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 15 1999

filename MIL2582.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 15-Sep-99
Julian Date	: 258
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992582s1	0.7217 uCi	0.6860 uCi	5.2%
Closing =>	992582s2	0.7163 uCi	0.6860 uCi	4.4%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99258201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.04945 uCi	0.05652 uCi	87%
Cs-137	0.04434 uCi	0.04712 uCi	94%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99258202
Weight used (g) : 1516.3
Live Time (s) : 900

Replicate filenames : 1a) 99258204
1b) 99258209

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.013 pCi/g	< 0.030 pCi/g
Replicate 1a	1.1 pCi/g	1.0 pCi/g
Replicate 1b	1.2 pCi/g	1.2 pCi/g
RPD 1	9%	18%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

Don Gilbert

filename : MIL2582S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
15-Sep-99	99258303	990807601	9 South	1518.1	1.3	12%	1.3	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258304	990809602	39 West Dup *	1578.6	1.1	13%	1.1	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258305	990729603	7	1532.8	1.3	12%	1.2	20%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258306	990726602	2 East	1561.4	0.9	12%	0.7	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258307	990804602	27 SE	1543.4	1.1	12%	1.2	20%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258308	990812603	Grid 114	1551.9	8.8	10%	9.7	15%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258310	990806602	9 North	1504.4	1.2	12%	1.1	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258311	990812606	25 E	1723.2	1.0	13%	1.4	30%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258312	990809604	116 West	1431.7	1.2	17%	1.3	25%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258313	990810601	37 SE	1446.9	1.1	12%	1.1	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258314	990817601	36 East	1334.9	1.2	12%	1.3	18%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258315	990812611	Grid 42 South	1576.7	1.8	11%	1.9	18%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258316	990812608	SE 1/2 of 28E	1689.2	1.1	11%	1.2	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258317	990812609	SE 1/2 25W	1584.3	1.1	13%	1.3	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
15-Sep-99	99258318	990816606	37 NW	1468.6	1.1	13%	1.0	26%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 0 5 1999

filename MIL2583.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 15-Sep-99
Julian Date	: 258
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992583s2	0.7308 uCi	0.6860 uCi	6.5%
Closing =>	992583s3	0.7168 uCi	0.6860 uCi	4.5%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99258201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05361 uCi	0.05652 uCi	95%
Cs-137	0.04492 uCi	0.04712 uCi	95%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99258302
Weight used (g) : 1536.4
Live Time (s) : 900

Replicate filenames : 1a) 99258304
1b) 99258309

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.009 pCi/g	< 0.020 pCi/g
Replicate 1a	1.1 pCi/g	1.1 pCi/g
Replicate 1b	1.2 pCi/g	1.0 pCi/g
RPD 1	9%	10%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

Dan Schert

filename : MIL2583S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
16-Sep-99	99259309	990817605	Grid 14 East	1561.9	1.0	12%	1.0	26%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259310	990817606	24 East	1632.1	1.0	12%	1.2	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259311	990816602	Grid 110\111	1456.1	1.8	11%	1.5	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259312	990816604	Grid 108	1345.5	1.8	11%	1.5	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259313	990813604	43 East Dup *	1610.7	1.0	13%	1.0	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259314	990816601	44 East	1434.3	1.4	12%	1.6	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259316	990818604	42 North	1552.6	1.0	14%	1.0	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259317	990818605	Grid 104\105	1206.8	1.4	12%	1.2	22%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259318	990819605	Grid 13	1574.0	0.8	14%	0.7	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259319	990819601	Grid 44 West	1526.4	1.2	12%	0.9	20%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)
16-Sep-99	99259320	990819602	Grid 44 West Dup *	1496.9	1.2	12%	1.2	18%	pCi/g	2	Millennium Excavation (Dried)(Recount after hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 0 5 1999

filename MIL2593 WK4

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Control Standard Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99259301	LCS	N/A	N/A	N/A	16-Sep-99	900	S/N 583-93-2
							reference date 15-MAR-98

Nuclide	Activity (uCi)	Uncertainty (2-sigma)		Percent Recovery
Cs-137	0.04548	13%	measured	
Cs-137	0.04712	3.0%	reference	97%
Co-60	0.05287	13%	measured	94%
Co-60	0.05652	3.0%	reference	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Calculated activity values for Cs-137 and Co-60 were decay corrected to the certificate reference date and then used to calculate recovery based on the certified reference value.

REVIEW and APPROVAL :

APPROVED OCT 12 1999

Don Seibert

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Blank Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99259302	BLANK	N/A	1436.2	N/A	16-Sep-99	900	EMPTY MARINELLI CONTAINER

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
Ra-226	< 0.0093	
Ra-228	< 0.021	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Sample weight (used for comparison of blank values to sample values) is the average of the samples counted in this bracket.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ac-228 and Ra-228.

4) Ra-226 value is calculated assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
22-Sep-99	99265205	990830602	52 North	1580.8	2.9	12%	2.3	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265206	990828602	Grid 53 East	1661.3	1.2	13%	1.0	22%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265207	990828603	Grid 53 West	1651.6	1.1	14%	1.2	23%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265208	990827601	Grid 23 East	1661.9	1.2	13%	1.5	26%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265209	990823601	Grid 24 W	1631.2	1.1	14%	1.1	22%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265210	990830604	Grid 16 West	1697.4	1.1	13%	1.2	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265211	990828601	Grid34 East	1736.5	1.0	13%	1.1	22%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265212	990827607	Grid 4 South	1502.7	1.0	13%	1.0	24%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265213	990828605	Grid 45 West Dup *	1513.5	1.1	15%	1.2	23%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265214	990827606	Grid 1	1509.7	1.4	12%	1.2	23%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265215	990824602	Grid 45 East	1405.8	1.3	13%	1.2	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265216	990830603	Grid 15	1553.4	1.0	14%	0.9	23%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.
'(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 0 5 1999

filename : MIL2652.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 22-Sep-99
Julian Date	: 265
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992652s2	0.7195 uCi	0.6860 uCi	4.9%
Closing =>	992652s3	0.7049 uCi	0.6860 uCi	2.8%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99265203

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05171 uCi	0.05652 uCi	91%
Cs-137	0.04413 uCi	0.04712 uCi	94%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99265204
Weight used (g) : 1592.2
Live Time (s) : 900

Replicate filenames : 1a) 99265211
1b) 99265217

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.0096 pCi/g	< 0.028 pCi/g
Replicate 1a	1.0 pCi/g	1.1 pCi/g
Replicate 1b	1.1 pCi/g	1.0 pCi/g
RPD 1	10%	10%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

filename : MIL2652S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
16-Sep-99	99259203	990812607	12N	1570.6	1.2	13%	1.2	21%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259204	990817603	SE 1/2 36 West	1480.4	1.2	13%	1.3	20%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259205	990812610	42N	1417.8	6.1	11%	6.9	15%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259206	990813602	Grid 114	1393.3	1.3	13%	1.3	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259207	990813605	43 West	1453.9	1.2	14%	0.9	26%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259208	990817604	NW 1/2 25 West	1592.4	1.0	14%	1.1	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259209	990818606	35 East	1268.0	1.2	14%	1.1	25%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259210	990818602	Grid 107	1551.4	2.1	13%	1.4	27%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259212	990818601	Grid 106	1168.7	3.7	11%	2.8	19%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259213	990818603	NW 1/2 of 36 W *	1348.1	1.2	13%	1.0	25%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259214	990819604	Grid 29E	1420.4	1.4	13%	1.4	22%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259215	990819603	Grid 102\103	1454.4	5.3	10%	1.4	30%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)
16-Sep-99	99259216	990819606	Grid 14 West	1748.6	1.0	16%	1.1	23%	pCi/g	2	Millennium Excavation (Dried) (Recount after hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 05 1999

filename MIL2592.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 16-Sep-99
Julian Date	: 259
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks : — QC Limits

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992592s1	0.6545 uCi	0.6860 uCi	4.6%
Closing =>	992592s2	0.6962 uCi	0.6860 uCi	1.5%

(measured activity decay corrected to reference date)

Calibration Check Deviation: < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99259201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05157 uCi	0.05652 uCi	91%
Cs-137	0.04427 uCi	0.04712 uCi	94%

(measured activity decay corrected to reference date)

LCS Recovery: 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99259202
Weight used (g) : 1451.4
Live Time (s) : 900

Replicate filenames : 1a) 99259206
1b) 99259211

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.014 pCi/g	< 0.031 pCi/g
Replicate 1a	1.3 pCi/g	1.3 pCi/g
Replicate 1b	1.2 pCi/g	1.4 pCi/g
RPD 1	8%	7%

Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

filename : MIL2592S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
22-Sep-99	99265303	990823602	29 W	1555.9	1.2	12%	1.4	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265306	990827602	2/3 *	1583.8	0.8	12%	0.7	24%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265307	990824601	Grid 35 West **	1835.3	1.0	17%	0.9	18%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265308	990830605	Grid 23 West	1590.1	1.1	13%	1.2	18%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265309	990824603	16 East	1695.7	1.0	14%	1.7	24%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265310	990828604	45 West	1576.4	1.1	13%	1.1	20%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265311	990827605	Grid 4 North	1563.7	1.1	12%	0.9	17%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265312	990827604	Grid 30 E	1607.1	1.1	11%	1.1	19%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265313	990830601	52 South	1271.7	1.5	15%	1.3	21%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)
22-Sep-99	99265314	990827603	Grid 39/40 *	1647.8	0.8	15%	0.8	20%	pCi/g	2	Millennium Excavation (Dried)(Recount after Hold)

* Samples 990827602 and 990827603 had discrepancies associated with their descriptions

** Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 03 1999

filename MIL2653.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 22-Sep-99
Julian Date	: 265
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992653s1	0.7092 uCi	0.6860 uCi	3.4%
Closing =>	992653s2	0.6980 uCi	0.6860 uCi	1.7%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99265304

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05244 uCi	0.05652 uCi	93%
Cs-137	0.04587 uCi	0.04712 uCi	97%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99265305
Weight used (g) : 1680.1
Live Time (s) : 900

Replicate filenames : 1a) 99265309
1b) 99265315

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.0080 pCi/g	< 0.018 pCi/g
Replicate 1a	1.0 pCi/g	1.7 pCi/g
Replicate 1b	1.0 pCi/g	1.3 pCi/g
RPD 1	0%	27%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED OCT 1 2 1999

filename : MIL2653S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	COC I.D.	Sealed Date	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Sample ID
05-Oct-99	99278301	990903602	Grid 100 N	1380.7	5.8	10%	2.3	17%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278304	990901601	51 East	1088.4	1.7	12%	1.6	25%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278305	990831602	Grid 34 West	1518.8	1.0	12%	1.0	17%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278306	990901602	Grid 18 East	1560.6	1.1	12%	1.2	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278307	990902601	Grid 22 East	1593.8	1.0	13%	1.5	31%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278308	990902602	Grid 46 E	1497.7	1.2	12%	1.0	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278309	990902603	Grid 31 East	1598.4	1.1	12%	1.2	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278310	990903601	Grid 56	1620.5	1.2	12%	1.2	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278311	990903603	Grid 101 South	1273.5	1.4	12%	1.2	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278312	990903604	Grid 33 E	1682.4	1.0	12%	1.0	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278313	990903605	Grid 18 West	1514.1	1.1	12%	1.4	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278314	990903606	Grid 17	1534.0	0.9	13%	1.2	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278315	990907601	22 West	1555.8	1.2	12%	1.2	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278316	990907602	31 West	1428.6	1.2	12%	1.1	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278317	990907603	31 West Dup *	1437.4	1.3	12%	1.3	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
05-Oct-99	99278318	990831601	Grid 30 West	1639.4	1.0	12%	1.1	21%	pCi/g	2	Millennium Excavation (Recount after Hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 1 0 1999

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RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 05-Oct-99
Julian Date	: 278
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992783s1	0.7347 uCi	0.6860 uCi	7.1%
Closing =>	992783s2	0.7101 uCi	0.6860 uCi	3.5%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99278303

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05284 uCi	0.05652 uCi	93%
Cs-137	0.04562 uCi	0.04712 uCi	97%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99278302
Weight used (g) : 1495.3
Live Time (s) : 900

Replicate filenames : 1a) 99278301
1b) 99278319

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.0089 pCi/g	< 0.020 pCi/g
Replicate 1a	5.8 pCi/g	2.3 pCi/g
Replicate 1b	5.8 pCi/g	2.4 pCi/g
RPD 1	0%	4%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 1 0 1999

filename : MIL2783S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
11-Oct-99	99284203	990908604	Grid 51 West	1490.8	1.3	14%	1.1	24%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284204	990908606	Grid 20 West	1533.5	1.3	14%	1.2	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284205	990908605	Grid19	1533.8	1.1	14%	1.1	24%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284206	990908603	57 West	1365.5	1.1	14%	1.0	25%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284207	990908607	Grid 20 East	1493.9	1.1	15%	1.4	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284208	990909601	Grid 46 West	1516.8	1.1	13%	1.2	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284209	990909602	Grid 21 East	1572.1	1.0	14%	0.8	30%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284210	990909603	21 West	1613.7	1.0	14%	1.3	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284211	990910601	32 East	1518.3	1.3	13%	1.3	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284212	990911601	Grid 47 East	1469.5	1.4	14%	1.3	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284213	990913601	Grid 58N	1363.4	1.0	14%	1.0	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284214	990907603	31 West	1314.2	1.5	18%	1.4	24%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284215	990908601	33 West	1650.4	1.1	13%	1.0	27%	pCi/g	2	Millennium Excavation (Recount after Hold)
11-Oct-99	99284216	990908602	Grid 57 East	1440.5	2.3	12%	1.4	22%	pCi/g	2	Millennium Excavation (Recount after Hold)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 1 0 1999

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filename : MIL2842.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 11-Oct-99
Julian Date	: 284
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992842s1	0.7213 uCi	0.6860 uCi	5.2%
Closing =>	992842s2	0.6956 uCi	0.6860 uCi	1.4%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99284201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05004 uCi	0.05652 uCi	89%
Cs-137	0.04396 uCi	0.04712 uCi	93%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99284202
Weight used (g) : 1342.3
Live Time (s) : 900

Replicate filenames : 1a) 99284208
1b) 99284217

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	0.3 pCi/g	< 0.034 pCi/g
Replicate 1a	1.1 pCi/g	1.2 pCi/g
Replicate 1b	1.2 pCi/g	1.2 pCi/g
RPD 1	9%	0%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 1 0 1999

filename : MIL2842S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
18-Oct-99	99291303	990914601	Grid 58 South	1514.7	1.2	12%	1.0	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291304	990915601	Grid 50 East	1560.1	1.5	11%	1.4	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291305	990915602	Grid 47 West	1488.1	1.4	12%	1.1	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291306	990916601	Grid 48 West	1409.1	1.1	12%	1.3	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291307	990918601	Grid 50 West	1435.0	1.1	12%	1.0	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291308	990918602	Grid 60 East	1339.3	1.0	12%	1.0	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291309	990920601	Grid 49 E	1446.3	1.1	13%	1.2	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291310	990920602	Grid 49 E Dup *	1452.9	1.2	13%	1.1	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291311	990921601	Grid 49 W	1404.5	1.2	13%	1.0	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
18-Oct-99	99291312	990921602	Grid 48 E	1378.8	3.2	11%	2.1	18%	pCi/g	2	Millennium Excavation (Recount after Hold)

* Description adjusted per end user request

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

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filename : MIL2913.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 18-Oct-99
Julian Date	: 291
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	992913s1	0.7225 uCi	0.6860 uCi	5.3%
Closing =>	992913s2	0.6989 uCi	0.6860 uCi	1.9%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99291302

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05262 uCi	0.05652 uCi	93%
Cs-137	0.04496 uCi	0.04712 uCi	95%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99291301
Weight used (g) : 1442.9
Live Time (s) : 900

Replicate filenames : 1a) 99291312
1b) 99291313

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.019 pCi/g	< 0.021 pCi/g
Replicate 1a	3.2 pCi/g	2.1 pCi/g
Replicate 1b	3.3 pCi/g	2.2 pCi/g
RPD 1	3%	5%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :
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filename : MIL2913S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
01-Nov-99	99305303	990927601	Grid 81	1673.7	1.0	12%	1.1	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305304	990929601	Grid 54 NE	1100.6	1.7	11%	1.3	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305305	990929602	Grid 40 N	1137.5	2.0	12%	1.2	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305306	990922601	Grid 41	1289.4	12.9	9%	4.3	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305307	990922602	Grid 60 West	1154.7	1.4	12%	1.4	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305308	990929601	Grid 54 NE	1082.8	1.8	11%	1.3	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305309	990929602	Grid 40 North	1207.3	2.0	11%	1.0	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305310	991001601	Grid 61 East	1344.1	1.1	12%	1.0	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305311	991001602	Grid 61 West	1333.7	1.6	11%	1.5	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305312	991001603	80 South	1380.0	1.1	12%	1.2	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305313	991001605	Grid 79 East	1353.3	1.1	12%	1.0	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305314	991001606	Grid 79 West	1295.5	2.4	11%	2.6	17%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305315	991001607	83 South	1292.0	1.2	12%	1.1	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305316	991002601	Grid 62 East	1313.5	2.1	11%	2.1	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305317	991002602	Grid 62 West	1390.9	1.2	12%	1.1	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305318	991002603	West 1/2 of 82 S	1427.3	0.9	12%	0.8	31%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305319	991004601	64 South	1421.7	1.2	11%	1.2	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305320	991004602	64 North	1443.7	1.3	11%	1.1	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305321	991004603	64 North	1423.8	1.3	12%	1.3	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305322	991004604	78 South	1475.0	0.9	14%	0.9	22%	pCi/g	2	Millennium Excavation (Recount after Hold)
01-Nov-99	99305324	991004605	78 North	1334.2	2.5	11%	3.5	16%	pCi/g	2	Millennium Excavation (Recount after Hold)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 10 1999

filename MIL3053.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 1-Nov-99
Julian Date	: 305
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks : — QC Limits

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993053s1	0.7025 uCi	0.6860 uCi	2.4%
Closing =>	993053s2	0.7147 uCi	0.6860 uCi	4.2%

(measured activity decay corrected to reference date)

Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99305301

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05208 uCi	0.05652 uCi	92%
Cs-137	0.04592 uCi	0.04712 uCi	97%

(measured activity decay corrected to reference date)

LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99305302
Weight used (g) : 1327.4
Live Time (s) : 900

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

Replicate filenames : 1a) 99305306, 1b) 99305323, 2a) 99305324, 2b) 99305325

Blank < specified MDA (1.0 pCi/g)

	Ra-226	Ra-228
Blank	< 0.010 pCi/g	< 0.023 pCi/g
Replicate 1a	12.9 pCi/g	4.3 pCi/g
Replicate 1b	12.8 pCi/g	4.8 pCi/g
RPD 1	1%	11%
Replicate 2a	2.5 pCi/g	3.5 pCi/g
Replicate 2b	2.5 pCi/g	3.6 pCi/g
RPD 2	0%	3%

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :
APPROVED NOV 10 1999

filename : MIL3053S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
04-Nov-99	99308303	991005601	63 N	1400.8	1.2	12%	0.8	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308304	991005602	65 North	1426.4	1.4	12%	1.3	26%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308305	991005603	84 South	1445.5	1.3	11%	1.3	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308306	991008608	67 North	1411.3	1.3	12%	1.0	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308307	991008609	66 North	1358.9	1.4	11%	1.2	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308308	991008610	77 South	1478.9	1.6	11%	1.4	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308309	991008611	77 North	1532.0	1.2	13%	1.1	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308311	991008612	76 North	1520.7	1.1	11%	1.2	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308312	991008613	75 North	1500.4	1.2	12%	1.4	19%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308313	991008614	76 South	1522.8	1.0	12%	1.1	24%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308314	991008615	68 North	1507.0	1.2	12%	1.4	17%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308315	991008616	68 North Dup	1497.3	1.1	12%	1.3	18%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308316	991008617	75 South	1542.5	1.1	13%	1.3	19%	pCi/g	2	Millennium Excavation (Recount after Hold)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.
(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 1 0 1999

filename MIL3083.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 4-Nov-99
Julian Date	: 308
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993083s1	0.7117 uCi	0.6860 uCi	3.7%
Closing =>	993082s2	0.6987 uCi	0.6860 uCi	1.9%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99308302

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05169 uCi	0.05652 uCi	91%
Cs-137	0.04546 uCi	0.04712 uCi	96%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99308301
Weight used (g) : 1472.7
Live Time (s) : 900

Replicate filenames : 1a) 99308309
1b) 99308310

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	0.2 pCi/g	< 0.020 pCi/g
Replicate 1a	1.2 pCi/g	1.1 pCi/g
Replicate 1b	1.2 pCi/g	1.1 pCi/g
RPD 1	0%	0%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 10 1999

filename : MIL3083S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
04-Nov-99	99308203	991008601	73 Northeast	980.4	31	9%	22	14%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308204	991008602	72 East	1488.6	1.2	14%	1.2	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308205	991008603	71 North	1453.6	1.1	14%	1.2	20%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308206	991008604	70 South	1469.9	1.1	14%	1.2	21%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308207	991008605	69 North	1447.7	1.2	16%	1.2	23%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308208	991008606	68 South	1497.3	1.2	15%	1.2	24%	pCi/g	2	Millennium Excavation (Recount after Hold)
04-Nov-99	99308209	991008607	66 South	1423.9	1.3	15%	1.2	23%	pCi/g	2	Millennium Excavation (Recount after Hold)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 17 1999

filename : MIL3082.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 4-Nov-99
Julian Date	: 308
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993082s1	0.6985 uCi	0.6860 uCi	1.8%
Closing =>	993082s2	0.7266 uCi	0.6860 uCi	5.9%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99308201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05070 uCi	0.05652 uCi	90%
Cs-137	0.04524 uCi	0.04712 uCi	96%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99308202
Weight used (g) : 1126.4
Live Time (s) : 900

Replicate filenames : 1a) 99308209
1b) 99308210

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.018 pCi/g	< 0.041 pCi/g
Replicate 1a	1.3 pCi/g	1.2 pCi/g
Replicate 1b	1.2 pCi/g	1.3 pCi/g
RPD 1	8%	8%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 17 1999

filename : MIL3082S.QC4

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample ID	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
16-Nov-99	99320203	991001604	80 North	1395.0	0.91	15%	0.90	26%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320204	991012601	82 NW Corner	1181.7	1.1	15%	1.0	25%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320205	991012602	Grid 85 NE	1352.3	1.4	14%	1.6	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320206	991012603	95 SW Corner	1129.9	1.2	13%	1.1	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320207	991012604	Grid 84 N	1530.2	1.5	14%	1.7	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320208	991012605	94 SE	1329.9	1.2	14%	1.1	25%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320209	991012606	94 NW	1668.9	1.1	14%	1.2	22%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320210	991012607	Grid 93 East	1575.1	1.3	14%	1.4	22%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320211	991012608	Grid 93 West	1473.3	1.1	14%	0.91	26%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320212	991013601	Grid 92 E	1502.1	1.3	14%	1.8	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320213	991013602	Grid 92 W	1495.9	1.02	14%	1.0	24%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320214	991018601	99A North	1598.2	0.82	16%	1.1	24%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320215	991015613	90 South	1450.4	1.0	16%	1.0	25%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320216	991015614	89 East *	1415.5	1.9	12%	1.6	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320217	991015615	88 East *	1469.6	1.3	14%	1.1	24%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320218	991015616	74 East *	1484.7	1.4	13%	1.3	22%	pCi/g	2	Millennium Excavation (Dried)(Recount)

* East ½ of Grid 92 11/24/99

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 2 2 1999

filename MIL3202 WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	16-Nov-99
Julian Date	320
Detector Number	2
Source Type	Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993202s1	0.7068 uCi	0.6860 uCi	3.0%
Closing =>	993202s2	0.6892 uCi	0.6860 uCi	0.5%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99320201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05249 uCi	0.05652 uCi	93%
Cs-137	0.04597 uCi	0.04712 uCi	98%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99320202
Weight used (g) : 1424.0
Live Time (s) : 900

Replicate filenames : 1a) 99320216
1b) 99320220

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.015 pCi/g	< 0.032 pCi/g
Replicate 1a	1.8 pCi/g	1.4 pCi/g
Replicate 1b	1.9 pCi/g	1.6 pCi/g
RPD 1	5%	13%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 19 1999

filename : MIL3202S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
16-Nov-99	99320303	991011601	Grid 70 North	1563.5	1.04	13%	1.3	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320304	991011602	86 South	1474.5	1.10	12%	1.2	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320305	991011603	87 South	1556.2	1.09	13%	1.4	19%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320306	991011604	Grid 85 SW	1438.4	1.21	12%	1.1	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320307	991011605	86 North	1494.1	1.2	18%	1.2	23%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320308	991011606	87 North	1554.3	1.25	12%	1.3	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320309	991015601	Grid 98 W	1495.1	1.4	11%	1.1	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320310	991015602	Grid 99 W	1453.1	1.01	12%	0.85	23%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320311	991015603	Grid 98 E	1514.5	1.4	11%	1.4	17%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320312	991015604	Grid 98 E	1476.7	1.3	12%	1.1	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320313	991015605	Grid 97 W	1680.6	0.82	13%	0.80	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320314	991015606	Grid 99 E	1575.9	0.87	13%	1.0	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320315	991015607	Grid 99A South	1610.1	0.86	13%	0.90	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320316	991015608	Grid 97 E	1416.3	0.94	13%	1.1	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320317	991015610	91 South	1614.6	1.19	12%	1.1	19%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320318	991015611	91 North	1438.6	1.12	12%	1.3	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
16-Nov-99	99320319	991015612	90 North	1581.8	0.91	13%	0.97	22%	pCi/g	2	Millennium Excavation (Dried)(Recount)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 2 2 1999

filename : MIL3203.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 16-Nov-99
Julian Date	: 320
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993203s1	0.7043 uCi	0.6860 uCi	2.7%
Closing =>	993203s2	0.6997 uCi	0.6860 uCi	2.0%

(measured activity decay corrected to reference date)

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99320301

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05216 uCi	0.05652 uCi	92%
Cs-137	0.04519 uCi	0.04712 uCi	96%

(measured activity decay corrected to reference date)

Sample Blank and Sample Replicate(s) :

Blank filename : 99320302
Weight used (g) : 1526.0
Live Time (s) : 900

Replicate filenames : 1a) 99320311
1b) 99320320

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.009 pCi/g	< 0.020 pCi/g
Replicate 1a	1.4 pCi/g	1.4 pCi/g
Replicate 1b	1.2 pCi/g	1.3 pCi/g
RPD 1	15%	7%

QC Limits

Calibration Check Deviation
< 20%

LCS Recovery
80% - 120%

Blank < specified MDA
(1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :
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filename : MIL3203S.QC4

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
17-Nov-99	99321303	991020601	Grid 39 E	1308.0	5.5	10%	2.3	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321304	991020602	Grid 41 E	1365.4	1.5	12%	1.4	19%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321305	991021601	Grid 103	1373.9	1.10	12%	1.0	22%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321306	991022601	103 SE / 102 NE	1343.5	1.4	11%	1.1	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321307	991022603	Grid 83 N	1464.4	1.07	12%	1.2	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321308	991022604	Grid 74 *	1523.0	1.8	11%	1.5	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321309	991022605	Grid 88 *	1516.0	1.6	11%	1.3	20%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321310	991022606	Grid 88	1547.2	1.6	11%	1.6	18%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321311	991022607	73 N	1509.2	1.00	12%	0.96	21%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321312	991022608	89 *	1501.4	1.9	11%	1.5	19%	pCi/g	2	Millennium Excavation (Dried)(Recount)
17-Nov-99	99321314	991022602	Grid 96	1414.3	0.92	13%	0.88	23%	pCi/g	2	Millennium Excavation (Dried)(Recount)

* west ½ of East 12 11/24/99

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL:

APPROVED NOV 19 1999

filename : MIL3213.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 17-Nov-99
Julian Date	: 321
Detector Number	: 3
Source Type	: Marinelli Soil Density

Bracket Calibration Checks :

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993213s1	0.7063 uCi	0.6860 uCi	3.0%
Closing =>	993213s2	0.7090 uCi	0.6860 uCi	3.4%

(measured activity decay corrected to reference date)

QC Limits: Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99321301

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05241 uCi	0.05652 uCi	93%
Cs-137	0.04557 uCi	0.04712 uCi	97%

(measured activity decay corrected to reference date)

QC Limits: LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99321302
Weight used (g) : 1442.4
Live Time (s) : 900

Replicate filenames : 1a) 99321303
1b) 99321313

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.0093 pCi/g	< 0.021 pCi/g
Replicate 1a	5.5 pCi/g	2.3 pCi/g
Replicate 1b	5.5 pCi/g	2.2 pCi/g
RPD 1	0%	4%

QC Limits: Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :

APPROVED NOV 19 1999

filename : MIL3213S.QC4

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (after drying and hold time)

Analysis Results Table

Counting Date	Spectrum File Name	Sample I.D.	Description	Net Weight (g)	Ra-226 Activity	Ra-226 Error	Ra-228 Activity	Ra-228 Error	Activity Units	Error Sigma	Comments
24-Nov-99	99328203	991028601	Grid 73	1511.7	1.3	15%	1.4	27%	pCi/g	2	Millennium Excavation (Dried)(Recount)

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Ra-226 value is calculated from Radon daughters after a hold time sufficient to allow ingrowth to secular equilibrium.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ra-228 and Ac-228.

REVIEW and APPROVAL :

APPROVED NOV 30 1999

filename : MIL3282.WK4

RMI Environmental Services

Gamma Spectroscopy System

Millennium Excavation Samples

Quality Control Results

Counting Date	: 24-Nov-99
Julian Date	: 328
Detector Number	: 2
Source Type	: Marinelli Soil Density

Bracket Calibration Checks : — QC Limits

Source Serial Number : 661-6-2

	filename	Measured Activity	Reference Activity	Percent Deviation
Opening =>	993282s1	0.6965 uCi	0.6860 uCi	1.5%
Closing =>	993282s2	0.7097 uCi	0.6860 uCi	3.5%

(measured activity decay corrected to reference date)

Calibration Check Deviation < 20%

Laboratory Control Standard :

Source Serial Number : 583-93-2
filename : 99328201

Nuclide	Measured Activity	Reference Activity	Percent Recovery
Co-60	0.05160 uCi	0.05652 uCi	91%
Cs-137	0.04540 uCi	0.04712 uCi	96%

(measured activity decay corrected to reference date)

LCS Recovery 80% - 120%

Sample Blank and Sample Replicate(s) :

Blank filename : 99328202
Weight used (g) : 1511.7
Live Time (s) : 900

Replicate filenames : 1a) 99328203
1b) 99328204

(an empty Marinelli beaker is used as the sample blank)
(weight used is the average of the samples in this bracket)

	Ra-226	Ra-228
Blank	< 0.014 pCi/g	< 0.031 pCi/g
Replicate 1a	1.3 pCi/g	1.4 pCi/g
Replicate 1b	1.3 pCi/g	1.3 pCi/g
RPD 1	0%	7%

Blank < specified MDA (1.0 pCi/g)

Relative Percent Difference
< 20%
< 40% if < 5 pCi/g
< 75% if < 2 pCi/g
n/a if < MDA

REVIEW and APPROVAL :
APPROVED NOV 3 0 1999

filename : MIL3282S.QC4

SUMMARY OF PCB RESULTS

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Field Sampling Data

Sample ID	Date	Location [1]	Depth (feet)	Photometer Readings			Result (Pass/Fail)	Laboratory Result (mg/kg)
				Sample	Control	Neg. Control		
TTA-1	6/29/99	Therminol	2	1.48	0.34*	1.75	Pass	NA
TTA-4A	6/29/99	Therminol	10.8	0.17	0.34*	1.75	Fail	NA
TTA-4B	6/29/99	Therminol	9.5	0.10	0.34*	1.75	Fail	NA
TTA-4C	6/29/99	Therminol (Resample of 4A)	15	1.42	0.34*	1.75	Pass	NA
TTA-4D	6/29/99	Therminol (Resample of 4B)	13	1.44	0.34*	1.75	Pass	NA
TTA-2A	7/1/99	Therminol	3	1.51	0.40*	1.62	Pass	NA
TTA-5A	7/6/99	Therminol	5.5	1.53	0.31*	1.57	Pass	NA
TTA-5B	7/6/99	Therminol	3.5	1.52	0.31*	1.57	Pass	NA
TTA-6A	7/8/99	Therminol	8.5	1.23	0.71*	1.37	Pass	NA
TTA-6B	7/8/99	Therminol	4	1.36	0.71*	1.37	Pass	NA
TTA-4E	7/12/99	Therminol	9	1.30	0.19*	1.23	Pass	NA
TTA-4F	7/12/99	Therminol	10	1.22	0.19*	1.23	Pass	NA
TTA-4G	7/12/99	Therminol	9	1.11	0.19*	1.23	Pass	NA
TTA-3A	7/14/99	Therminol	3	0.06	0.22*	1.31	Fail	NA
TTA-3B	7/15/99	Therminol (Resample of 3A)	5	0.99	0.37*	1.04	Pass	NA
TTA-2B	7/15/99	Therminol	5	1.15	0.37*	1.04	Pass	NA
AREA C-1	7/20/99	AREA "C"	4.5	1.13	0.30*	1.13	Pass	NA
GRID-7	7/29/99	MRP Grid 7	3	1.09	0.91**	1.09	Pass	NA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Field Sampling Data

Sample ID	Date	Location [1]	Depth (feet)	Photometer Readings			Result (Pass/Fail)	Laboratory Result (mg/kg)
				Sample	Control	Neg. Control		
MRPG25-01	8/12/99	MRP Grid 25	10	0.86	0.72**	1.05	Pass	< 1.2
MRPG40-01	9/3/99	MRP Grid 40	Surface	0.68	0.59**	0.74	Pass	NA
GRID 100/101	9/3/99	MRP Grid 101	3	0.62	0.59**	0.74	Pass	< 2.0
MRPG33-01	9/7/99	MRP Grid 33	6	0.89	0.69**	0.79	Pass	< 1.3
MRPG60-01	9/18/99	MRP Grid 60	18	0.73	0.60**	0.76	Pass	NA
FPNG56	10/2/99	N. of Grid 56	Surface	1.00	0.88**	1.02	Pass	NA
FPNG58	10/2/99	N. of Grid 58	Surface	1.00	0.88**	1.02	Pass	NA
WIPE	10/18/99	Footer Wall in AREA "A"	2.5	1.00	0.47*	1.35	Pass	NA
AREA A	10/18/99	AREA "A"	4.5	1.34	0.47*	1.35	Pass	NA
AREA D	10/19/99	AREA "D"	1.5	1.07	0.12*	1.04	Pass	NA
AREA B	10/20/99	AREA "B"	2.5	0.91	0.44*	1.12	Pass	NA
GRID 73	10/21/99	MRP Grid 73 Below Concrete	2.5	0.29	0.91**	1.35	Fail	76
AREA E-1	10/21/99	AREA "E"	3.5	1.29	0.38*	1.09	Pass	NA
GRID 73	10/25/99	MRP Grid 73 Below Concrete	2.5	0.19	0.19*	0.53	Fail	76
AREA E-2	10/25/99	AREA "E"	9	0.58	0.19*	0.53	Pass	NA
AREA E-3	10/25/99	AREA "E"	7	0.62	0.19*	0.53	Pass	NA
AREA E-4	10/25/99	AREA "E"	5	0.15	0.22*	0.76	Fail	NA
AREA E-5	10/25/99	AREA "E"	6	0.40	0.22*	0.76	Pass	NA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Field Sampling Data

Sample ID	Date	Location [1]	Depth (feet)	Photometer Readings			Result (Pass/Fail)	Laboratory Result (mg/kg)
				Sample	Control	Neg. Control		
AREA E-6	10/25/99	AREA "E"	7	0.67	0.22*	0.76	Pass	NA
AREA E-7	10/25/99	AREA "E"	6	0.57	0.22*	0.76	Pass	NA
AREA E-8	10/25/99	AREA "E"	4	0.11	0.22*	0.76	Fail	NA
AREA E-9	10/26/99	AREA "E" (Resample of E-8)	5	0.59	0.36*	0.75	Pass	NA
AREA E-10	10/26/99	AREA "E" (Resample of E-4)	7.5	0.44	0.25*	0.58	Pass	NA
GRID 73-2	10/28/99	MRP Grid 73 Below Concrete (Resample of 73)	2.5	0.93	0.92**	1.01	Pass	NA

1) Actual sample locations are shown on the As-Built Drawings, located in Appendix A. Resamples occurred after additional excavation due to failing sample results.

* Analyzed for 50 mg/kg, the cleanup goal within the Plant Process Areas.

** Analyzed for 3.1 mg/kg, the cleanup goal outside the FSCA.

LAYDOWN AREA STOCKPILE RESULTS

Antech Ltd.

One Triangle Lane • Export, Pennsylvania 15632 • Phone: (724) 733-1161 • Fax: (724) 327-7793

November 5, 1999

Mr. Stephen G. Kilper
American Landfill Management, Inc
One American Way
Warren, OH 44484-5555

Soil Characterization
Millennium Landfill MRP; MRP Top Cover Soil
Antech Ltd. Project No. 99-5983

Dear Mr. Kilper:

Enclosed are analytical results for samples submitted by American Landfill Management, Inc. Samples were received and logged in for analysis on October 21, 1999.

Appropriate U.S. Environmental Protection Agency methods were used and are indicated accordingly on the data tables. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd.'s Statement of Qualifications. If you have any questions, please call me.

Sincerely,

Kathryn L. Stoudnour

Kathryn L. Stoudnour
Project Manager

KLS:vt

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. **PROJECT LOGIN INFORMATION:**

A: **PROJECT NUMBERS:**

ANTECH LTD.: 99-5983
CLIENT: Millennium Landfill MRP

B: **SAMPLE IDENTIFICATIONS:**

Antech ID	Client ID	Antech ID	Client ID
9910-2680	MRP-NW	9910-2681	MRP-SW
9910-2682	MRP-NE	9910-2683	MRP-SE

C: **SHIPPING/RECEIVING COMMENTS:**

None

II. **PREPARATION/ANALYSIS COMMENTS:**

A: **GENERAL CHEMISTRY:**
None

B: **METALS:**
Sample results reported on an "as received" basis.

C: **ORGANICS:**

1. **VOLATILES:**
None

2. **PESTICIDES/PCBS:**
None

III. **GENERAL COMMENTS:**

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
Volatile Organic Analysis
EPA Method 8260[1]
American Landfill Management, Inc.
Antech Ltd. Project No. 99-5983
Soil Characterization; Millennium Landfill MRP
MRP Top Cover Soil

Parameter	CAS[2] Number	Units	Sample Identification 9910-2680 MRP-NW (10/20/99)	9910-2681 MRP-SW (10/20/99)	9910-2682 MRP-NE (10/20/99)
Acetone	67-64-1	µg/kg	<100	<100	<100
Benzene	71-43-2	µg/kg	<5.0	<5.0	<5.0
Bromodichloromethane	75-27-4	µg/kg	<5.0	<5.0	<5.0
Bromoform	75-25-2	µg/kg	<5.0	<5.0	<5.0
Bromomethane	74-83-9	µg/kg	<10	<10	<10
2-Butanone (MEK)	78-93-3	µg/kg	<10	<10	<10
Carbon disulfide	75-15-0	µg/kg	<5.0	<5.0	<5.0
Carbon tetrachloride	56-23-5	µg/kg	<5.0	<5.0	<5.0
Chlorobenzene	108-90-7	µg/kg	<5.0	<5.0	<5.0
Chlorodibromomethane	124-48-1	µg/kg	<5.0	<5.0	<5.0
Chloroethane	75-00-3	µg/kg	<10	<10	<10
Chloromethane	74-87-3	µg/kg	<10	<10	<10
Chloroform	67-66-3	µg/kg	<5.0	<5.0	<5.0
1,1-Dichloroethane	75-34-3	µg/kg	<5.0	<5.0	<5.0
1,2-Dichloroethane	107-06-2	µg/kg	<5.0	<5.0	<5.0
1,1-Dichloroethene	75-35-4	µg/kg	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	156-59-2	µg/kg	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	156-60-5	µg/kg	<5.0	<5.0	<5.0
1,2-Dichloropropane	78-87-5	µg/kg	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	10061-01-5	µg/kg	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	10061-02-6	µg/kg	<5.0	<5.0	<5.0
Ethylbenzene	100-41-4	µg/kg	<5.0	<5.0	<5.0
2-Hexanone	591-78-6	µg/kg	<50	<50	<50
Methylene chloride	75-09-2	µg/kg	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	108-10-1	µg/kg	<50	<50	<50
Styrene	100-42-5	µg/kg	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	<5.0	<5.0	<5.0
Tetrachloroethene	127-18-4	µg/kg	<5.0	<5.0	<5.0
Toluene	108-88-3	µg/kg	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	71-55-6	µg/kg	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	79-00-5	µg/kg	<5.0	<5.0	<5.0
Trichloroethene	79-01-6	µg/kg	<5.0	<5.0	<5.0
Vinyl chloride	75-01-4	µg/kg	<10	<10	<10
Xylenes (Total)	1330-20-7	µg/kg	<5.0	<5.0	<5.0

See footnotes at end of table.

Table 1
Antech Ltd. Project No. 99-5983
(Continued)

Parameter	CAS[2] Number	Units	Sample Identification: 9910-2683 MRP-SE (10/20/99)	Sample Identification: 9910-2684 Method Blank (10/21/99)
Acetone	67-64-1	µg/kg	<100	<100
Benzene	71-43-2	µg/kg	<5.0	<5.0
Bromodichloromethane	75-27-4	µg/kg	<5.0	<5.0
Bromoform	75-25-2	µg/kg	<5.0	<5.0
Bromomethane	74-83-9	µg/kg	<10	<10
2-Butanone (MEK)	78-93-3	µg/kg	<10	<10
Carbon disulfide	75-15-0	µg/kg	<5.0	<5.0
Carbon tetrachloride	56-23-5	µg/kg	<5.0	<5.0
Chlorobenzene	108-90-7	µg/kg	<5.0	<5.0
Chlorodibromomethane	124-48-1	µg/kg	<5.0	<5.0
Chloroethane	75-00-3	µg/kg	<10	<10
Chloromethane	74-87-3	µg/kg	<10	<10
Chloroform	67-66-3	µg/kg	<5.0	<5.0
1,1-Dichloroethane	75-34-3	µg/kg	<5.0	<5.0
1,2-Dichloroethane	107-06-2	µg/kg	<5.0	<5.0
1,1-Dichloroethene	75-35-4	µg/kg	<5.0	<5.0
cis-1,2-Dichloroethene	156-59-2	µg/kg	<5.0	<5.0
trans-1,2-Dichloroethene	156-60-5	µg/kg	<5.0	<5.0
1,2-Dichloropropane	78-87-5	µg/kg	<5.0	<5.0
cis-1,3-Dichloropropene	10061-01-5	µg/kg	<5.0	<5.0
trans-1,3-Dichloropropene	10061-02-6	µg/kg	<5.0	<5.0
Ethylbenzene	100-41-4	µg/kg	<5.0	<5.0
2-Hexanone	591-78-6	µg/kg	<50	<50
Methylene chloride	75-09-2	µg/kg	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	108-10-1	µg/kg	<50	<50
Styrene	100-42-5	µg/kg	<5.0	<5.0
1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	<5.0	<5.0
Tetrachloroethene	127-18-4	µg/kg	36	<5.0
Toluene	108-88-3	µg/kg	<5.0	<5.0
1,1,1-Trichloroethane	71-55-6	µg/kg	<5.0	<5.0
1,1,2-Trichloroethane	79-00-5	µg/kg	<5.0	<5.0
Trichloroethene	79-01-6	µg/kg	<5.0	<5.0
Vinyl chloride	75-01-4	µg/kg	<10	<10
Xylenes (Total)	1330-20-7	µg/kg	<5.0	<5.0

(1) U.S. Environmental Protection Agency, 1987, Test Methods for Evaluating Solid Waste, SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.
(2) CAS = Chemical Abstracts Services.

Table 2
Polychlorinated Biphenyl Data Table
EPA Method 8082[1]
American Landfill Management, Inc.
Antech Ltd. Project No. 99-5983
Soil Characterization; Millennium Landfill MRP
MRP Top Cover Soil

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification: Polychlorinated Biphenyls mg/kg	Parameter Identification: Aroclor Source
9910-2680	MRP-NW	10/20/99	7.0	1248
9910-2681	MRP-SW	10/20/99	12	1248
9910-2682	MRP-NE	10/20/99	12	1248
9910-2683	MRP-SE	10/20/99	17	1248
9910-2684	Method Blank	10/21/99	<1.0	NONE

[1] U.S. Environmental Protection Agency, 1987, Test Methods for Evaluating Solid Waste, SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

Table 3
General Data Table
American Landfill Management, Inc.
Antech Ltd. Project No. 99-5983
Soil Characterization; Millennium Landfill MRP
MRP Top Cover Soil

Parameter	Analytical Method	Units	Sample Identification 9910-2680 MRP-NW (10/20/99)	9910-2681 MRP-SW (10/20/99)	9910-2682 MRP-NE (10/20/99)
Flash Point	1010 (1)	°F	>200	>200	>200
pH	9045 (1)	pH units	7.88	7.81	7.95
Total Metals:					
Silver (Total)	6010 (1)	mg/kg	0.77	0.75	0.69
Aluminum (Total)	6010 (1)	mg/kg	5700	6500	6500
Arsenic (Total)	6010 (1)	mg/kg	5.4	8.2	7.6
Barium (Total)	6010 (1)	mg/kg	50	54	54
Beryllium (Total)	6010 (1)	mg/kg	<0.20	<0.20	<0.20
Calcium (Total)	6010 (1)	mg/kg	18000	17000	23000
Cadmium (Total)	6010 (1)	mg/kg	1.2	1.3	1.2
Cobalt (Total)	6010 (1)	mg/kg	8.5	9.0	9.3
Chromium (Total)	6010 (1)	mg/kg	100	89	99
Copper (Total)	6010 (1)	mg/kg	17	16	17
Iron (Total)	6010 (1)	mg/kg	19000	21000	21000
Mercury (Total)	7471 (1)	mg/kg	0.33	<0.10	<0.10
Potassium (Total)	6010 (1)	mg/kg	560	630	740
Magnesium (Total)	6010 (1)	mg/kg	6300	6700	8600
Manganese (Total)	6010 (1)	mg/kg	640	700	700
Sodium (Total)	6010 (1)	mg/kg	<200	<200	<200
Nickel (Total)	6010 (1)	mg/kg	20	21	22
Lead (Total)	6010 (1)	mg/kg	16	17	29
Antimony (Total)	6010 (1)	mg/kg	<0.50	<0.50	<0.50
Selenium (Total)	6010 (1)	mg/kg	<1.0	<1.0	<1.0
Thallium (Total)	6010 (1)	mg/kg	<0.80	<0.80	<0.80
Vanadium (Total)	6010 (1)	mg/kg	180	180	200
Zinc (Total)	6010 (1)	mg/kg	57	57	53

See footnotes at end of table.

Table 3
Antech Ltd. Project No. 99-5983
(Continued)

Parameter	Analytical Method	Units	Sample Identification: 9910-2683 MRP-SE (10/20/99)	Sample Identification: 9910-2684 Method Blank (10/21/99)
Flash Point	1010[1]	°F	>200	NAP[2]
pH	9045[1]	pH units	7.81	NAP
Total Metals:				
Silver (Total)	6010[1]	mg/kg	2.9	<0.20
Aluminum (Total)	6010[1]	mg/kg	6200	<10
Arsenic (Total)	6010[1]	mg/kg	6.6	<0.50
Barium (Total)	6010[1]	mg/kg	52	<2.0
Beryllium (Total)	6010[1]	mg/kg	<0.20	<0.20
Calcium (Total)	6010[1]	mg/kg	14000	<200
Cadmium (Total)	6010[1]	mg/kg	1.2	<0.20
Cobalt (Total)	6010[1]	mg/kg	11	<1.0
Chromium (Total)	6010[1]	mg/kg	200	<0.20
Copper (Total)	6010[1]	mg/kg	18	<1.0
Iron (Total)	6010[1]	mg/kg	20000	<5.0
Mercury (Total)	7471[1]	mg/kg	0.24	<0.10
Potassium (Total)	6010[1]	mg/kg	710	<100
Magnesium (Total)	6010[1]	mg/kg	5200	<50
Manganese (Total)	6010[1]	mg/kg	600	<1.0
Sodium (Total)	6010[1]	mg/kg	<200	<200
Nickel (Total)	6010[1]	mg/kg	23	<2.0
Lead (Total)	6010[1]	mg/kg	22	<0.50
Antimony (Total)	6010[1]	mg/kg	<0.50	<0.50
Selenium (Total)	6010[1]	mg/kg	2.7	<1.0
Thallium (Total)	6010[1]	mg/kg	<0.80	<0.80
Vanadium (Total)	6010[1]	mg/kg	420	<1.0
Zinc (Total)	6010[1]	mg/kg	57	<1.0

[1] U.S. Environmental Protection Agency, 1987, Test Methods for Evaluating Solid Waste, SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.
[2] NAP = Not applicable.

Antech Ltd.
Chain of Custody Record

Ship To:
Antech Ltd.
One Triangle Drive
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only
Laboratory Project No.: [illegible]

Project Name: MILLENNIUM LANDFILL MRP Project No.: Sampler: SCOTT MOORE (Printed Name) Scott Moore (Signature)

Relinquished By: (Signature and Printed Name)	Date	Time	Received By: (Signature and Printed Name)	Date	Time
Scott Moore Scott Moore	10-20-99	1:30	STEPHEN L. KILPER	10-20-99	1:30PM
Relinquished By: (Signature and Printed Name)	Date	Time	Received at Lab By: (Signature and Printed Name)	Date	Time
STEPHEN L. KILPER	10-20-99	3:00P	[signature]	10 21 99	0900

Antech Quote ID No.:
Antech Contact Name:
Client Purchase Order No.:
Method of Shipment: FED EX
Shipment ID:

Please Check when Monitoring Samples are Collected:
☐ Residual Chlorine Present
☐ Residual Chlorine Not Present

Please Check when VOA Vials are Collected:
☐ Free of Bubbles
☐ Bubbles Present
(Specify in Special Instructions/Comments)

Circle Bottle Size: Chemistry (500 ml, 1000 ml) / Nutrient (250 ml, 500 ml) / Total Metals (250 ml, 500 ml) / Dissolved Metals (250 ml, 500 ml) / Cyanide (1000 ml) / Phenolics (1000 ml) / TOC (125 ml) / TOX (250 ml) / Sulfide (500 ml) / Oil & Grease (1000 ml) / TPHC (1000 ml) / Bacteriological (125 ml) / VOA (40 ml) / Organics: Pest/PCB/Herb/SV (1 or 2 1/2 L) / Radiological (1000 ml) / VOA Septa Jar, Soil (125 ml) / Widemouth Jar, Soil (250 ml, 500 ml, 1000 ml) / VOA Sampling Device 5g / VOA Methanol Vial (5ml / 25 ml) / PCB Wipe Can (Hexane) / Other (Please Specify)

Sample ID Number	Date	Time	Description	Grab	Composite	Chemistry (500 ml, 1000 ml)	Nutrient (250 ml, 500 ml)	Total Metals (250 ml, 500 ml)	Dissolved Metals (250 ml, 500 ml)	Cyanide (1000 ml)	Phenolics (1000 ml)	TOC (125 ml)	TOX (250 ml)	Sulfide (500 ml)	Oil & Grease (1000 ml)	TPHC (1000 ml)	Bacteriological (125 ml)	VOA (40 ml)	Organics: Pest/PCB/Herb/SV (1 or 2 1/2 L)	Radiological (1000 ml)	VOA Septa Jar, Soil (125 ml)	Widemouth Jar, Soil (250 ml, 500 ml, 1000 ml)	VOA Sampling Device 5g	VOA Methanol Vial (5ml / 25 ml)	PCB Wipe Can (Hexane)	No. of Containers	For Lab Use Only Laboratory ID
MRP-NW	10-20-99	1:00P	MRP TOP COVER SOIL	X																		1	3			4	[illegible]
MRP-SW	10-20-99	1:00P	" " " "	X																		1	3			4	[illegible]
MRP-NE	10-20-99	1:00P	" " " "	X																		1	3			4	[illegible]
MRP-SE	10-20-99	1:00P	" " " "	X																		1	3			4	[illegible]

Special Instructions/Comments: RUSH!
TCL, VOC'S, PCB

MRP-NW - 2'	MRP-SE - 6
MRP-SW - 4'	MRP-NE - 8

Sample Return/Disposal:
☐ Return to Client
☒ Disposal by Antech

Results To:
Client Name: STEVE KILPER
Company: ALM 1
Address: ONE AMERICAN WAY
WARREN, OHIO 44484
FAX 330-856-8483

Invoice To:
Client Name: SAME AS ABOVE
Company:
Address:

For Laboratory Use Only
Sample Condition Upon Receipt/Comments:
Was Temperature Vial Sent With Cooler? YES ✓ NO ___ Cooler Temperature: 7.3
WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt

MAC.Antech-Admin.Antech Chain of Custody
Rev.: 02/16/98

THERMINOL TANK AREA RADIOLOGICAL RESULTS

Millennium
Inorganic Chemicals

Americas – Ashtabula Plant 2
2426 Middle Road
P.O. Box 160
Ashtabula, Ohio 44004
Tel. 440-997-5501
Fax 440-969-9214

Ms. Terese Van Donsel
USEPA Region 5
Superfund Division
77 West Jackson Blvd.
Chicago, Ill. 60604-3590

May 12, 1999

Re: Soil boring radiochemical results-Therminol areas

Dear Ms. Van Donsel:

On March 25 and 26,1999, 4 areas of the Millennium Inorganic Chemicals TiCl4 Plant were sampled by core boring into native soil. The purpose was to determine the extent of Radium concentration in the Therminol storage areas.

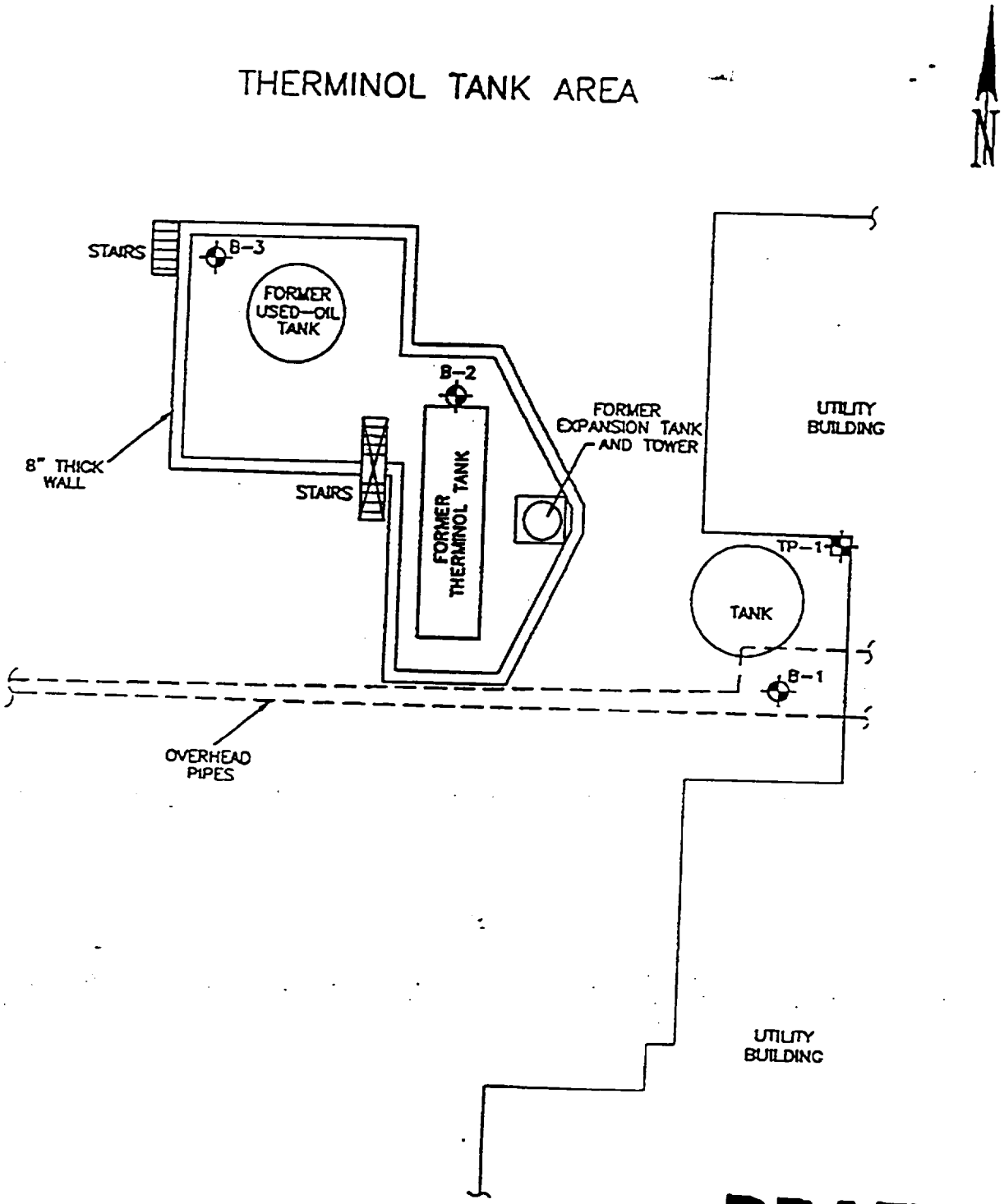
The samples were packaged at the site and analyzed by RMIES. Results show that Radionuclide concentrations are at background in this area.

If you have any questions, don't hesitate to call.

Sincerely,

Richard Hughes
Environmental Supervisor

THERMINOL TANK AREA



DRAFT

EDP Consultants, Inc.
9575 CHILLICOTHE RD., KIRTLAND, OH 44094
PHONE 440-256-6600 FAX 440-256-0607

BORING/TEST PIT LOCATION PLAN
MILLENNIUM TiCl4 SAMPLING
ASHTABULA, OHIO
PROJECT NO. 99119E

DWG DATE	DWG BY	APPROVED BY
4-13-99	HRP	DPH

APPROX. SCALE 1"=20'

RMI Environmental Services
A Division of RMI Titanium Company

P.O. BOX 579
ASHTABULA, OHIO 44005-0579
440/992-7442
FAX 440/993-1995

RMI-ESH:99-028

April 20, 1999

Mr. Rick Hughes
Millennium Inorganic Chemicals
P.O. Box 160
2426 Middle Road
Ashtabula, Ohio 44004

Dear Rick:

Please find attached the analytical results associated with the core borings recently performed in conjunction with the PCB sampling at the Millennium Plant #2 facility.

If you have questions or need additional information, please call.

Sincerely,

RMI ENVIRONMENTAL SERVICES

Eric P. Marsh
Director,
Environmental, Safety and Health

EPM:bm

Attachments

cc w/att: N. F. Brewer

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample I.D.	Sample Description	Sample Weight (g)	Prep date	Counting date	Counting live time (sec)	Comments
99097410	990406705	B1 0.5'-2'	87.1	06-Apr-99	07-Apr-99	3341	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	29%
U-235	n/a	
U-238	2	29%
Th-232	1.0	38%
Th-230	2	29%
Th-228	1.0	38%
Ra-228	1.0	38%
Ra-226	< 7	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Dan Sebert

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098401	990406706	B1 2'-4'	97.2	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	1	88%
U-235	n/a	
U-238	1	88%
Th-232	0.9	22%
Th-230	1	88%
Th-228	0.9	22%
Ra-228	0.9	22%
Ra-226	< 5	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Dan Schert

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098402	990406707	B1 4'-6'	89.9	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	1.7	70%
U-235	n/a	
U-238	1.7	70%
Th-232	1.3	26%
Th-230	1.7	70%
Th-228	1.3	26%
Ra-228	1.3	26%
Ra-226	< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Dm Sebert

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098403	990406708	B1 6'-8'	107.6	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	72%
U-235	n/a	
U-238	2	72%
Th-232	1.0	29%
Th-230	2	72%
Th-228	1.0	29%
Ra-228	1.0	29%
Ra-226	< 5	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.
'(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 19 1999

Don Schert

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample I.D.	Sample Description	Sample Weight (g)	Prep date	Counting date	Counting live time (sec)	Comments
99098404	990406709	B2 0'-2'	99.0	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	3	44%
U-235	n/a	
U-238	3	44%
Th-232	1.6	21%
Th-230	3	44%
Th-228	1.6	21%
Ra-228	1.6	21%
Ra-226	< 9	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.
'(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Don Sebest

RMI Environmental Services

Gamma Spectroscopy System

Replicate Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098410	990406709	B2 0'-2'	99.0	06-Apr-99	08-Apr-99	3600	replicate count of spectrum 99098404

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)	Replicate Activity (pCi/g)	Relative Percent Difference
U-234	2	55%	3	40%
U-235	n/a		n/a	
U-238	2	55%	3	40%
Th-232	1.8	26.0%	1.6	12%
Th-230	2	55%	3	40%
Th-228	1.8	26.0%	1.6	12%
Ra-228	1.8	26.0%	1.6	12%
Ra-226	< 9		< 9	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample I.D.	Sample Description	Sample Weight (g)	Prep date	Counting date	Counting live time (sec)	Comments
99098405	990406710	B2 2'-4'	92.6	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	3	41%
U-235	n/a	
U-238	3	41%
Th-232	1.1	24%
Th-230	3	41%
Th-228	1.1	24%
Ra-228	1.1	24%
Ra-226	< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Dm Sebest

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098406	990406711	B2 4'-6'	102.0	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	51%
U-235	n/a	
U-238	2	51%
Th-232	1.0	24%
Th-230	2	51%
Th-228	1.0	24%
Ra-228	1.0	24%
Ra-226	< 4	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample I.D.	Sample Description	Sample Weight (g)	Prep date	Counting date	Counting live time (sec)	Comments
99098407	990406712	B2 6'-8'	90.7	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	59%
U-235	n/a	
U-238	2	59%
Th-232	< 0.5	
Th-230	2	59%
Th-228	< 0.5	
Ra-228	< 0.5	
Ra-226	< 7	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 19 1999

[signature]

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098408	990406713	B3 0'-2'	100.1	06-Apr-99	08-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	3	31%
U-235	n/a	
U-238	3	31%
Th-232	1.2	22%
Th-230	3	31%
Th-228	1.2	22%
Ra-228	1.2	22%
Ra-226	< 8	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample I.D.	Sample Description	Sample Weight (g)	Prep date	Counting date	Counting live time (sec)	Comments
99099401	990406714	B3 2'-4'	91.3	06-Apr-99	09-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	< 2	
U-235	n/a	
U-238	< 2	
Th-232	1.0	46%
Th-230	< 2	
Th-228	1.0	46%
Ra-228	1.0	46%
Ra-226	< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Dm Sebest

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample				Prep	Counting			Comments
	I.D.	Description	Weight (g)		date	date	live time (sec)		
99099402	990406715	B3 4'-6'	98.7		06-Apr-99	09-Apr-99	3600		Millennium Core Sample (Non-Marinelli)
									(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	63%
U-235	n/a	
U-238	2	63%
Th-232	1.1	30%
Th-230	2	63%
Th-228	1.1	30%
Ra-228	1.1	30%
Ra-226	< 4	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99099403	990406716	B3 6'-8'	94.0	06-Apr-99	09-Apr-99	3600	Millennium Core Sample (Non-Marinelli) (dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	66%
U-235	n/a	
U-238	2	66%
Th-232	1.4	30%
Th-230	2	66%
Th-228	1.4	30%
Ra-228	1.4	30%
Ra-226	< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Replicate Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99099405	990406714	B3 2'-4'	91.3	06-Apr-99	09-Apr-99	3600	replicate count of spectrum 99099401

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)	Replicate Activity (pCi/g)	Relative Percent Difference
U-234	3	39%	< 2	
U-235	n/a		n/a	
U-238	3	39%	< 2	
Th-232	1.1	23%	1.0	10%
Th-230	3	39%	< 2	
Th-228	1.1	23%	1.0	10%
Ra-228	1.1	23%	1.0	10%
Ra-226	< 6		< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 19 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99097407	990406701	TP1-0.5'	101.3	06-Apr-99	07-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	49%
U-235	n/a	
U-238	2	49%
Th-232	1.2	25%
Th-230	2	49%
Th-228	1.2	25%
Ra-228	1.2	25%
Ra-226	< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL:
APPROVED APR 19 1999

Don Schert

RMI Environmental Services

Gamma Spectroscopy System

Replicate Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99097412	990406701	TP1-0.5'	101.3	06-Apr-99	07-Apr-99	3600	replicate count of spectrum 99097407

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	3	43%
U-235	n/a	
U-238	3	43%
Th-232	1.5	25%
Th-230	3	43%
Th-228	1.5	25%
Ra-228	1.5	25%
Ra-226	< 8	

Replicate Activity (pCi/g)	Relative Percent Difference
2	40%
n/a	
2	40%
1.2	22%
2	40%
1.2	22%
1.2	22%
< 6	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99097408	990406702	TP1-1.5'	111.4	06-Apr-99	07-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	75%
U-235	n/a	
U-238	2	75%
Th-232	0.7	27%
Th-230	2	75%
Th-228	0.7	27%
Ra-228	0.7	27%
Ra-226	< 5	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

Don Gilbert

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99102403	990406703	TP1-3'	1680.8	06-Apr-99	12-Apr-99	3600	Millennium Core Sample (Mannelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	0.9	42%
U-235	< 0.3	
U-238	0.9	42%
Th-232	1.0	14%
Th-230	0.9	42%
Th-228	1.0	14%
Ra-228	1.0	14%
Ra-226	< 3	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

REVIEW and APPROVAL :

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RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99097409	990406704	TP1-5.0'	99.4	06-Apr-99	07-Apr-99	3600	Millennium Core Sample (Non-Marinelli)
							(dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	2	38%
U-235	n/a	
U-238	2	38%
Th-232	1.0	26%
Th-230	2	38%
Th-228	1.0	26%
Ra-228	1.0	26%
Ra-226	< 7	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. '(additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

3) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

4) Ra-226 value is calculated as less than the upper limit of activity associated with the 186 keV peak assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

5) U-235 was not analyzed for due to insignificant amount present and relatively short counting times.

REVIEW and APPROVAL:

APPROVED APR 1 9 1999

Dan Gilbert

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Control Standard Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99099406	LCS	N/A	N/A	N/A	09-Apr-99	900	S/N 548-150-3
							reference date 1-MAR-97

Nuclide	Activity (uCi)	Uncertainty (2-sigma)		Percent Recovery
Cs-137	0.04687	3.9%	measured	
Cs-137	0.04633	3.0%	reference	101%
Co-60	0.05525	3.8%	measured	97%
Co-60	0.05700	3.0%	reference	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Calculated activity values for Cs-137 and Co60 were decay corrected to the certificate reference date and then used to calculate recovery based on the certified reference value.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Blank Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99099404	BLANK	N/A	94.7	N/A	09-Apr-99	3600	EMPTY NON-MARINELLI CONTAINER

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	< 0.53	
U-235	n/a	
U-238	< 0.53	
Th-232	< 0.44	
Th-230	< 0.53	
Th-228	< 0.44	
Ra-228	< 0.44	
Ra-226	< 1.3	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Sample weight (used for comparison of blank values to sample values) is the average of the samples counted in this bracket.

3) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

4) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

5) U-235 was not analyzed for due to insignificant amount present in the samples and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 19 1999

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Control Standard Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098411	LCS	N/A	N/A	N/A	08-Apr-99	900	S/N 548-150-3
							reference date 1-MAR-97

Nuclide	Activity (uCi)	Uncertainty (2-sigma)		Percent Recovery
Cs-137	0.04675	4.0%	measured	
Cs-137	0.04633	3.0%	reference	101%
Co-60	0.05292	3.7%	measured	93%
Co-60	0.05700	3.0%	reference	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Calculated activity values for Cs-137 and Co60 were decay corrected to the certificate reference date and then used to calculate recovery based on the certified reference value.

REVIEW and APPROVAL :

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RMI Environmental Services

Gamma Spectroscopy System

Laboratory Blank Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99098409	BLANK	N/A	97.4	N/A	08-Apr-99	3600	EMPTY NON-MARINELLI CONTAINER

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	< 0.85	
U-235	n/a	
U-238	< 0.85	
Th-232	< 0.33	
Th-230	< 0.85	
Th-228	< 0.33	
Ra-228	< 0.33	
Ra-226	< 1.3	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Sample weight (used for comparison of blank values to sample values) is the average of the samples counted in this bracket.

3) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

4) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

5) U-235 was not analyzed for due to insignificant amount present in the samples and relatively short counting times.

REVIEW and APPROVAL :

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RMI Environmental Services

Gamma Spectroscopy System

Laboratory Control Standard Analysis Results

Spectrum Filename	Sample			Prep	Counting		Comments
	I.D.	Description	Weight (g)	date	date	live time (sec)	
99097413	LCS	N/A	N/A	N/A	07-Apr-99	900	S/N 548-150-3
							reference date 1-MAR-97

Nuclide	Activity (uCi)	Uncertainty (2-sigma)		Percent Recovery
Cs-137	0.04674	3.9%	measured	
Cs-137	0.04633	3.0%	reference	101%
Co-60	0.05526	3.7%	measured	97%
Co-60	0.05700	3.0%	reference	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Calculated activity values for Cs-137 and Co60 were decay corrected to the certificate reference date and then used to calculate recovery based on the certified reference value.

REVIEW and APPROVAL :

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DM Silvest

RMI Environmental Services

Gamma Spectroscopy System

Laboratory Blank Analysis Results

Spectrum Filename	Sample				Prep	Counting		Comments
	I.D.	Description	Weight (g)		date	date	live time (sec)	
99097411	BLANK	N/A	99.8		N/A	07-Apr-99	3600	EMPTY NON-MARINELLI CONTAINER

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
U-234	< 0.76	
U-235	n/a	
U-238	< 0.76	
Th-232	< 0.33	
Th-230	< 0.76	
Th-228	< 0.33	
Ra-228	< 0.33	
Ra-226	< 1.4	

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only.

2) Sample weight (used for comparison of blank values to sample values) is the average of the samples counted in this bracket.

3) Calculated activity values for U-234, U-238, and Th-230 assume secular equilibrium between U-238, Th-234, U-234, and Th-230.

4) Calculated activity values for Th-232, Ra-228 and Th-228 assume secular equilibrium between Th-232, Ra-228, Ac-228, and Th-228.

5) U-235 was not analyzed for due to insignificant amount present in the samples and relatively short counting times.

REVIEW and APPROVAL :

APPROVED APR 1 9 1999

APPENDIX C
INSTALLED MATERIAL DATA

APPENDIX C
INSTALLED MATERIAL DATA

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SOIL AND PAVING COMPACTION TEST RESULTS	44 pages
LSM 50 DESIGN MIX	1 page

Antech Ltd.
Chain of Custody Record

Ship To:
Antech Ltd.
One Triangle Lane
Export, PA 15632
(724) 733-1161
FAX (724) 327-7793

Page 1 of 1

For Laboratory Use Only
Laboratory Project No.: 89-3074

Project Name: MILLENNIUM BACKFILL / TOPSOIL
Project No.:
Sampler: STEPHEN G. KILPER (Printed Name) [signature] (Signature)

Relinquished By: (Signature and Printed Name) [signature] STEPHEN G. KILPER — Date 6-28-99 — Time 9:00A
Received By: (Signature and Printed Name) [signature] — Date 6-29-99 — Time 1020
Relinquished By: (Signature and Printed Name) — Date — Time
Received By: (Signature and Printed Name) — Date — Time

Antech Quote ID No.:
Antech Contact Name:
Client Purchase Order No.:
Method of Shipment:
Shipment ID:

Please Check when Monitoring Samples are Collected:
☐ Residual Chlorine Present
☐ Residual Chlorine Not Present

Please Check when VOA Vials are Collected:
☐ Free of Bubbles
☐ Bubbles Present
(Specify in Special Instructions/Comments)

Circle Bottle Size

Sample ID Number	Sample Description: Date	Time	Description	Grab	Composite	Chemistry (500 ml, 1000 ml)	Nutrient (250 ml, 500 ml)	Total Metals (250 ml, 500 ml)	Dissolved Metals (250 ml, 500 ml)	Cyanide (1000 ml)	Phenolics (1000 ml)	TOC (125 ml)	TOX (250 ml)	Sulfide (500 ml)	Radiological (1000 ml)	Oil & Grease (1000 ml)	TPHC (1000 ml)	VOA (40 ml)	Organics (1000 ml, 2.5 liter)	Bacteriological (125 ml)	Widemouth Jar, Soil (250 ml, 500 ml, 1000 ml)	VOA Septa Jar, Soil (125 ml)	ENCORE (VOC's)	Other (Please Specify)				No. of Containers	For Lab Use Only Laboratory ID
MAL BACKFILL N	6-28-99	0630	SOIL	X																			4						4180
" " S	6-28-99	0630	"	X																			4						4181
" TOPSOIL N	6-28-99	0700	"	X																			4						4182
" " S	6-28-99	0700	"	X																			4						4183

Special Instructions/Comments: PLEASE COMPOSITE & RUN VOC ONLY

Sample Return/Disposal:
☐ Return to Client
☒ Disposal by Antech

Results To: Client Name: ~~[illegible]~~ STEPHEN G. KILPER
Company: AMERICAN LANDFILL MANAGEMENT, INC
Address: ONE AMERICAN WAY
WARREN, OH 44484
Phone No: 330-856-8800
Fax No: 330-856-8483

Invoice To: Client Name: SAME
Company:
Address:

For Laboratory Use Only
Sample Condition Upon Receipt:
Was Temperature Vial Sent With Cooler? YES NO Cooler Temperature
WHITE - Original COC File YELLOW - Return with Report PINK - Project File GOLD - Client Receipt

MILLENNIUM LANDFILL BORROW SOIL RESULTS

Antech Ltd.

One Triangle Lane • Export, Pennsylvania 15632 • Phone: (724) 733-1161 • Fax: (724) 327-7793

July 1, 1999

Mr. Stephen G. Kilper
American Landfill Management, Inc
One American Way
Warren, OH 44484-5555

Soil Characterization
Millennium Soil Samples; Backfill and Topsoil
Antech Ltd. Project No. 99-3671

Dear Mr. Kilper:

Enclosed are analytical results for samples submitted by American Landfill Management, Inc. Samples were received and logged in for analysis on June 29, 1999.

Appropriate U.S. Environmental Protection Agency methods were used and are indicated accordingly on the data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd.'s Statement of Qualifications. If you have any questions, please call me.

Sincerely,

Kathryn L. Stoudnour

Kathryn L. Stoudnour
Project Manager

KLS:vt

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 99-3671
CLIENT: Millennium Soil Samples

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9906-4180	MAL Backfill N	9906-4181	MAL Backfill S
9906-4182	MAL Topsoil N	9906-4183	MAL Topsoil S

C: SHIPPING/RECEIVING COMMENTS:

None

II. PREPARATION/ANALYSIS COMMENTS:

A: ORGANICS:

1. VOLATILES:
Methylene chloride is a common laboratory contaminant. Results for this analyte should be considered estimates unless the amount found in the sample is 3 to 5 times higher than that found in the method blank.

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
Volatile Organic Analysis Data
EPA Method 8260[1]
American Landfill Management, Inc.
Antech Ltd. Project No. 99-3671
Soil Characterization; Millennium Soil Samples
Backfill and Topsoil

Parameter	CAS[2] Number	Units	Sample Identification 9906-4180 MAL Backfill N (6/28/99)	9906-4181 MAL Backfill S (6/28/99)
Acetone	67-64-1	µg/kg	<100	<100
Benzene	71-43-2	µg/kg	<5.0	<5.0
Bromodichloromethane	75-27-4	µg/kg	<5.0	<5.0
Bromoform	75-25-2	µg/kg	<5.0	<5.0
Bromomethane	74-83-9	µg/kg	<10	<10
2-Butanone (MEK)	78-93-3	µg/kg	<10	<10
Carbon disulfide	75-15-0	µg/kg	<5.0	<5.0
Carbon tetrachloride	56-23-5	µg/kg	<5.0	<5.0
Chlorobenzene	108-90-7	µg/kg	<5.0	<5.0
Chlorodibromomethane	124-48-1	µg/kg	<5.0	<5.0
hloroethane	75-00-3	µg/kg	<10	<10
nloromethane	74-87-3	µg/kg	<10	<10
Chloroform	67-66-3	µg/kg	<5.0	<5.0
1,1-Dichloroethane	75-34-3	µg/kg	<5.0	<5.0
1,2-Dichloroethane	107-06-2	µg/kg	<5.0	<5.0
1,1-Dichloroethene	75-35-4	µg/kg	<5.0	<5.0
cis-1,2-Dichloroethene	156-59-2	µg/kg	<5.0	<5.0
trans-1,2-Dichloroethene	156-60-5	µg/kg	<5.0	<5.0
1,2-Dichloropropane	78-87-5	µg/kg	<5.0	<5.0
cis-1,3-Dichloropropene	10061-01-5	µg/kg	<5.0	<5.0
trans-1,3-Dichloropropene	10061-02-6	µg/kg	<5.0	<5.0
Ethylbenzene	100-41-4	µg/kg	<5.0	<5.0
2-Hexanone	591-78-6	µg/kg	<50	<50
Methylene chloride	75-09-2	µg/kg	5.4	<5.0
4-Methyl-2-pentanone (MIBK)	108-10-1	µg/kg	<50	<50
Styrene	100-42-5	µg/kg	<5.0	<5.0
1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	<5.0	<5.0
Tetrachloroethene	127-18-4	µg/kg	<5.0	<5.0
Toluene	108-88-3	µg/kg	<5.0	<5.0
1,1,1-Trichloroethane	71-55-6	µg/kg	<5.0	<5.0
1,1,2-Trichloroethane	79-00-5	µg/kg	<5.0	<5.0
Trichloroethene	79-01-6	µg/kg	<5.0	<5.0
Vinyl chloride	75-01-4	µg/kg	<10	<10
Xylenes (Total)	1330-20-7	µg/kg	<5.0	<5.0

See footnotes at end of table.

Table 1
Antech Ltd. Project No. 99-3671
(Continued)

Parameter	CAS[2] Number	Units	Sample Identification 9906-4182 MAL Topsoil N (6/28/99)	9906-4183 MAL Topsoil S (6/28/99)	9906-4184 Method Blank (6/29/99)
Acetone	67-64-1	µg/kg	<100	<100	<100
Benzene	71-43-2	µg/kg	<5.0	<5.0	<5.0
Bromodichloromethane	75-27-4	µg/kg	<5.0	<5.0	<5.0
Bromoform	75-25-2	µg/kg	<5.0	<5.0	<5.0
Bromomethane	74-83-9	µg/kg	<10	<10	<10
2-Butanone (MEK)	78-93-3	µg/kg	<10	<10	<10
Carbon disulfide	75-15-0	µg/kg	<5.0	<5.0	<5.0
Carbon tetrachloride	56-23-5	µg/kg	<5.0	<5.0	<5.0
Chlorobenzene	108-90-7	µg/kg	<5.0	<5.0	<5.0
Chlorodibromomethane	124-48-1	µg/kg	<5.0	<5.0	<5.0
Chloroethane	75-00-3	µg/kg	<10	<10	<10
Chloromethane	74-87-3	µg/kg	<10	<10	<10
Chloroform	67-66-3	µg/kg	<5.0	<5.0	<5.0
1,1-Dichloroethane	75-34-3	µg/kg	<5.0	<5.0	<5.0
1,2-Dichloroethane	107-06-2	µg/kg	<5.0	<5.0	<5.0
1,1-Dichloroethene	75-35-4	µg/kg	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	156-59-2	µg/kg	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene	156-60-5	µg/kg	<5.0	<5.0	<5.0
1,2-Dichloropropane	78-87-5	µg/kg	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	10061-01-5	µg/kg	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	10061-02-6	µg/kg	<5.0	<5.0	<5.0
Ethylbenzene	100-41-4	µg/kg	<5.0	<5.0	<5.0
2-Hexanone	591-78-6	µg/kg	<50	<50	<50
Methylene chloride	75-09-2	µg/kg	6.6	6.4	6.4
4-Methyl-2-pentanone (MIBK)	108-10-1	µg/kg	<50	<50	<50
Styrene	100-42-5	µg/kg	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	<5.0	<5.0	<5.0
Tetrachloroethene	127-18-4	µg/kg	<5.0	<5.0	<5.0
Toluene	108-88-3	µg/kg	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	71-55-6	µg/kg	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	79-00-5	µg/kg	<5.0	<5.0	<5.0
Trichloroethene	79-01-6	µg/kg	<5.0	<5.0	<5.0
Vinyl chloride	75-01-4	µg/kg	<10	<10	<10
Xylenes (Total)	1330-20-7	µg/kg	<5.0	<5.0	<5.0

(1) U.S. Environmental Protection Agency, 1987, Test Methods for Evaluating Solid Waste, SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.
(2) CAS = Chemical Abstracts Services.

SOIL AND PAVING COMPACTION TEST RESULTS

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

99 JUN 18 A9:35

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:6-16-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☑ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO	DESCRIPTION
1	6-1-99	1	Soil Compaction Report
1	6-2-99	2	Soil Compaction Report
1	6-14-99	3	Soil Compaction Report
1	-	4	Standard Proctor Curves 1 through 6
1	-	5	Table 1 Summary of Laboratory Testing (Std. Proctor)
1	-	6	Technician Time Tickets

THESE ARE TRANSMITTED AS CHECKED BELOW:

☑ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

99 JUN 18 A9:35

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:6-16-99	FILE NO. A990298x24
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Independence, Ohio 44131-8055		

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1	6-1-99	1	Soil Compaction Report
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1	-	5	Table 1 Summary of Laboratory Testing (Std. Proctor)
1	-	6	Technician Time Tickets

THESE ARE TRANSMITTED AS CHECKED BELOW:

☑ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

Table 1
Summary of Laboratory Soil Testing
Standard Proctor Tests
Millennium Inorganic Chemicals

Curve #	*Description*	*Maximum Dry Density pcf **	*Optimum Moisture %*	*Location*	*Date Collected*
1	Brown Sandy Silt, Little Clay, Gravel, Trace Organics, Shale (subgrade)	112.6	13.2	onsite	01-Jun-99
2	304 Limestone (subbase)	137.4	7.3	onsite	11-Jun-99
3	Gray Sandy Silt and Clay, Some Shale, Trace Gravel	124.9	10.6	Offsite Stockpile	01-Jun-99
4	Gray Sandy Silt, Little Shale, Trace Clay, Organics	118.9	12.2	Offsite Stockpile	01-Jun-99
5	Mottled Brown & Gray Sandy Silt, Little Shale, Tr. Gravel, Organics, Clay, Glass	119.1	11.9	Offsite Stockpile	01-Jun-99
6	Brown Sandy Silt, Little Gravel, Trace Shale, Glass, Organics, Clay	118.5	12.3	Offsite Stockpile	01-Jun-99

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Eric Faehner
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	June 1, 1999	Page 1/1
Activity:		
Compaction of access road subgrade [no formal spec. on compaction].		

Curve Number	Maximum Dry Density	% Opt. Moisture
1	112.6	13.2

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	8' right of center line/100' E. of State	subgrade	109.4	15.4	97.2%	1	P	
2	1' right of center line/210' E. of State	subgrade	108.1	16.5	96.0%	1	P	

Comments: Tests in cut area

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Eric Faehner
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	June 2, 1999	Page 1/1
Activity:		
Compaction of access road subgrade [no formal spec. on compaction].		
INPLACE DENSITY ONLY [no curve]		

Curve Number	Maximum Dry Density	% Opt. Moisture

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	5' west of center line/32' N. of Middle	subgrade	122.8	9.1				
2	112' N. of Middle	subgrade	104.0	18.5				

Comments:

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Rebecca Wayne
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	June 14, 1999	Page 1/1
Activity:		
Access Road off of Middle Road &		
Access Road off of State Road		
304 limestone		

Curve Number	Maximum Dry Density	% Opt. Moisture
2	137.4	7.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

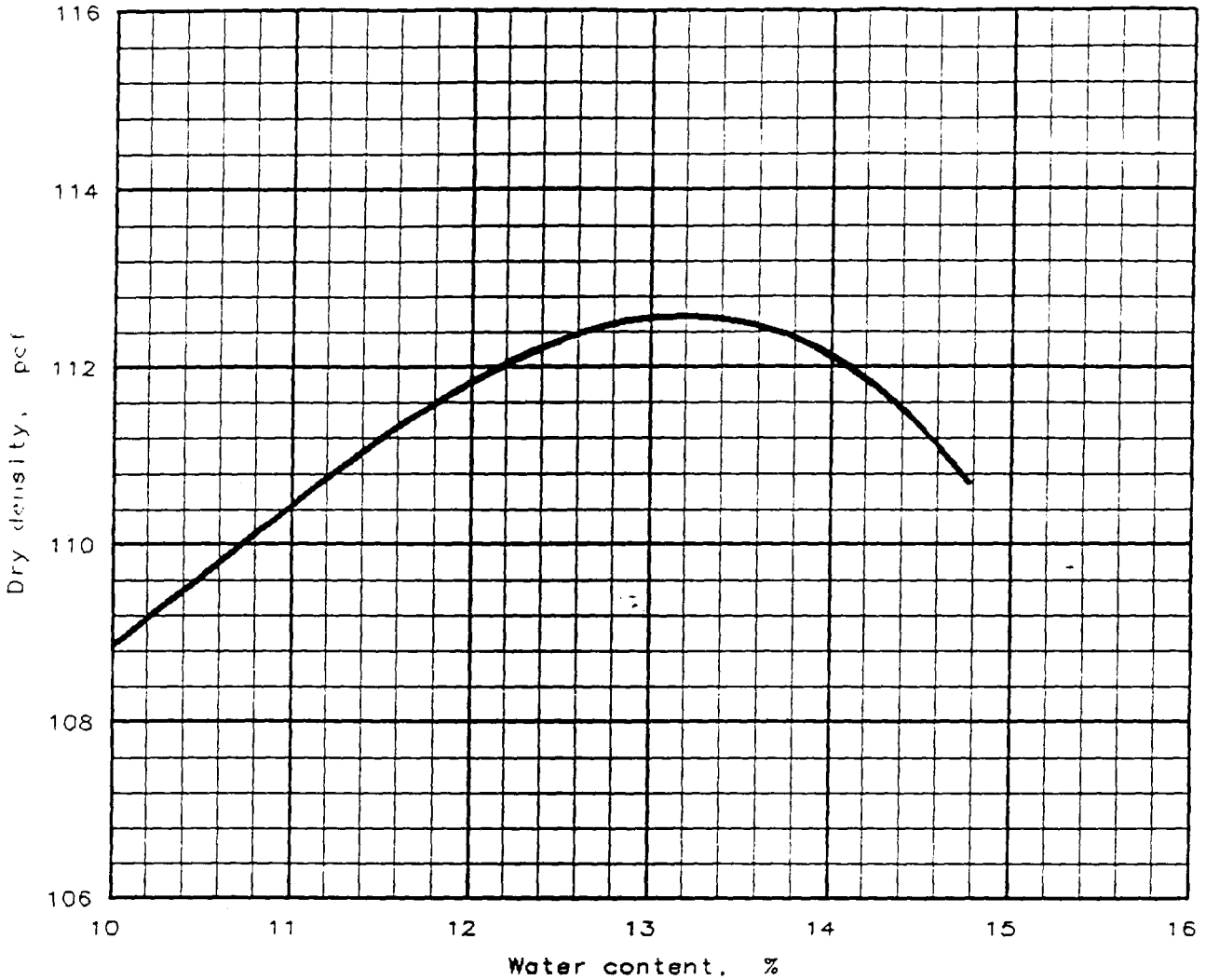
Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	On Center line 238' N. of Middle Rd	638.9	143.1	5.1	104.1%	2	Pass (P)	
2	2' W. of Center line 141' N. of Middle Rd	638.4	142.8	5.5	103.9%	2	Pass (P)	
3	1' E. of Center line 78' N. of Middle Rd	640.0	142.4	5.2	103.6%	2	Pass (P)	
4	4' S. of Center line 59' E. of State Rd	623.5	142.5	5.1	103.7%	2	Pass (P)	
5	On Center line 142' E. of State Rd	623.5	142.3	4.9	103.6%	2	Pass (P)	
6	2' N. of Center line 237' E. of State Rd	623.5	142.4	5.7	103.6%	2	Pass (P)	

Comments:

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			18.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.6 pcf Optimum moisture = 13.2 %	Brown SANDY SILT, Little Clay, Gravel, Trace Organics, Shale

Project No.: A990298x1

Project: Melenium Inorganic

Location: 500' N of State + Middle Rd. Intersec.

75' E of State (Access Road Subgrade)

Date: 6-03-1999

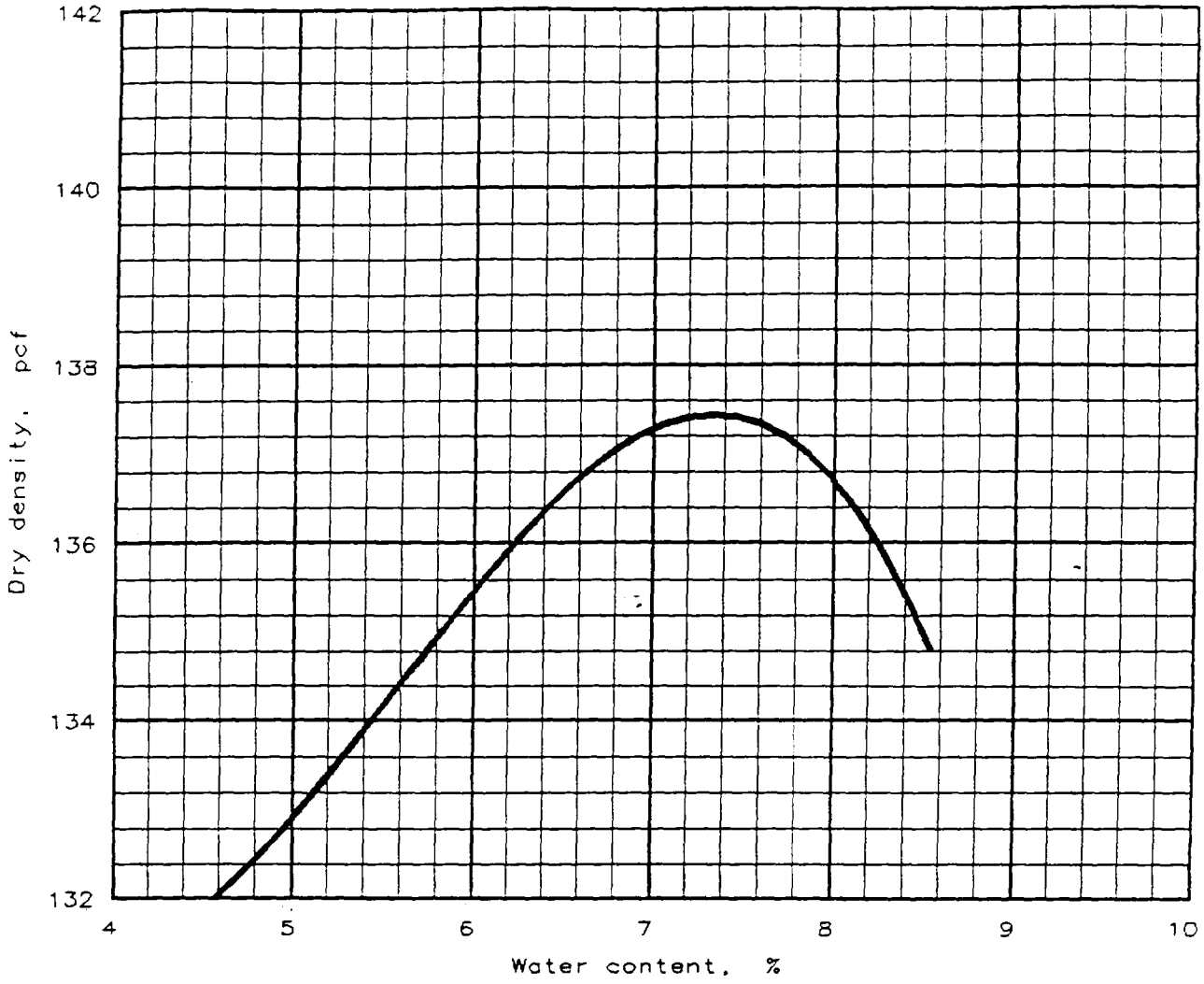
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
							28.7 %	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 137.4 pcf Optimum moisture = 7.3 %	304 Limestone

Project No.: A990298x1

Project: Melenium Inorganic

Location: Access Road @ Middle Rd. & State Rd.

Date: 6-14-1999

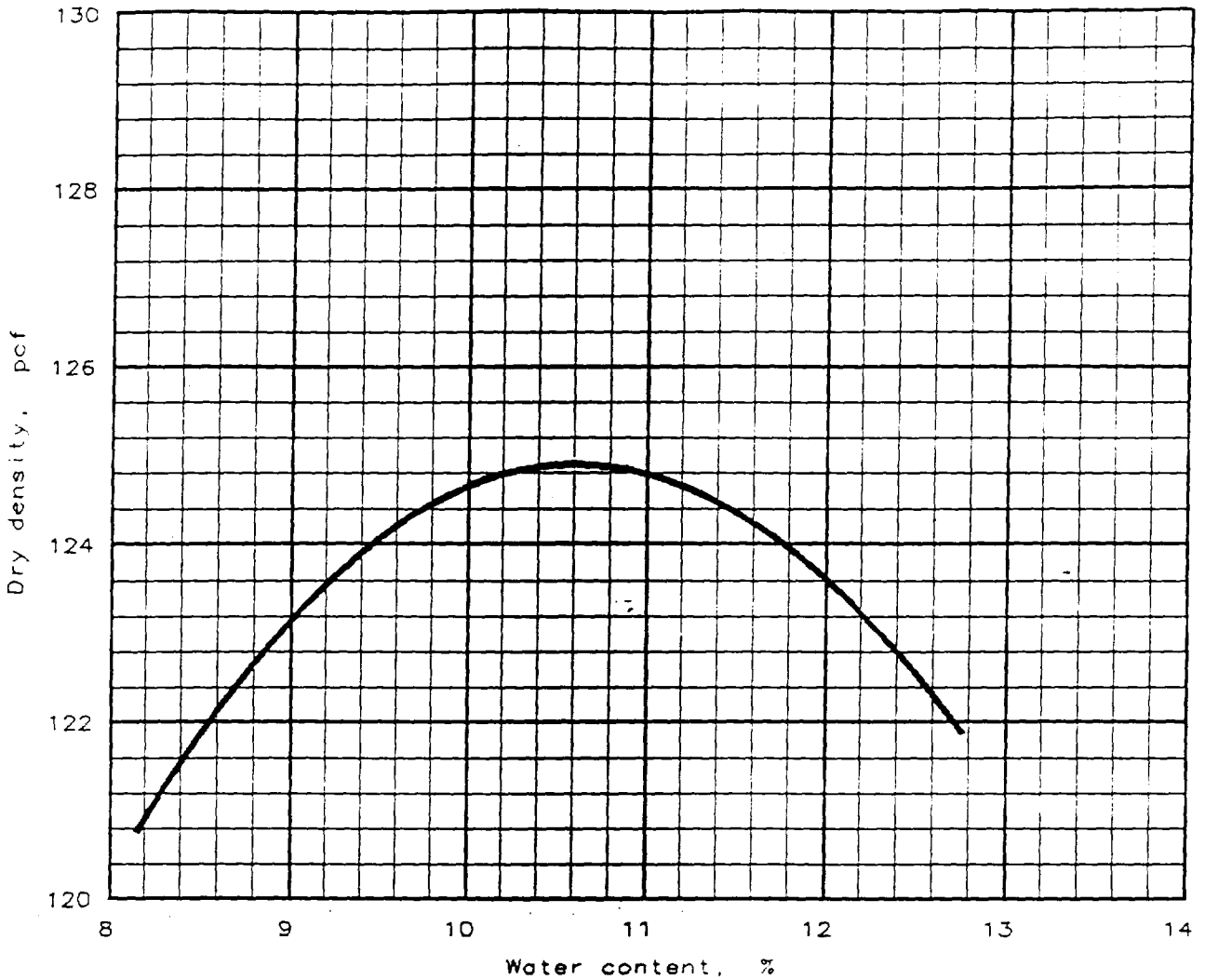
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, .Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			9.9 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 124.9 pcf Optimum moisture = 10.6 %	Gray SANDY SILT + CLAY, Some Shale, Trace Gravel

Project No.: A990298x1

Project: Melenium Inorganic

Location: 33' above Drive, 100' S of end of Drive, 50' E of end of Drive

Date: 6-03-1999

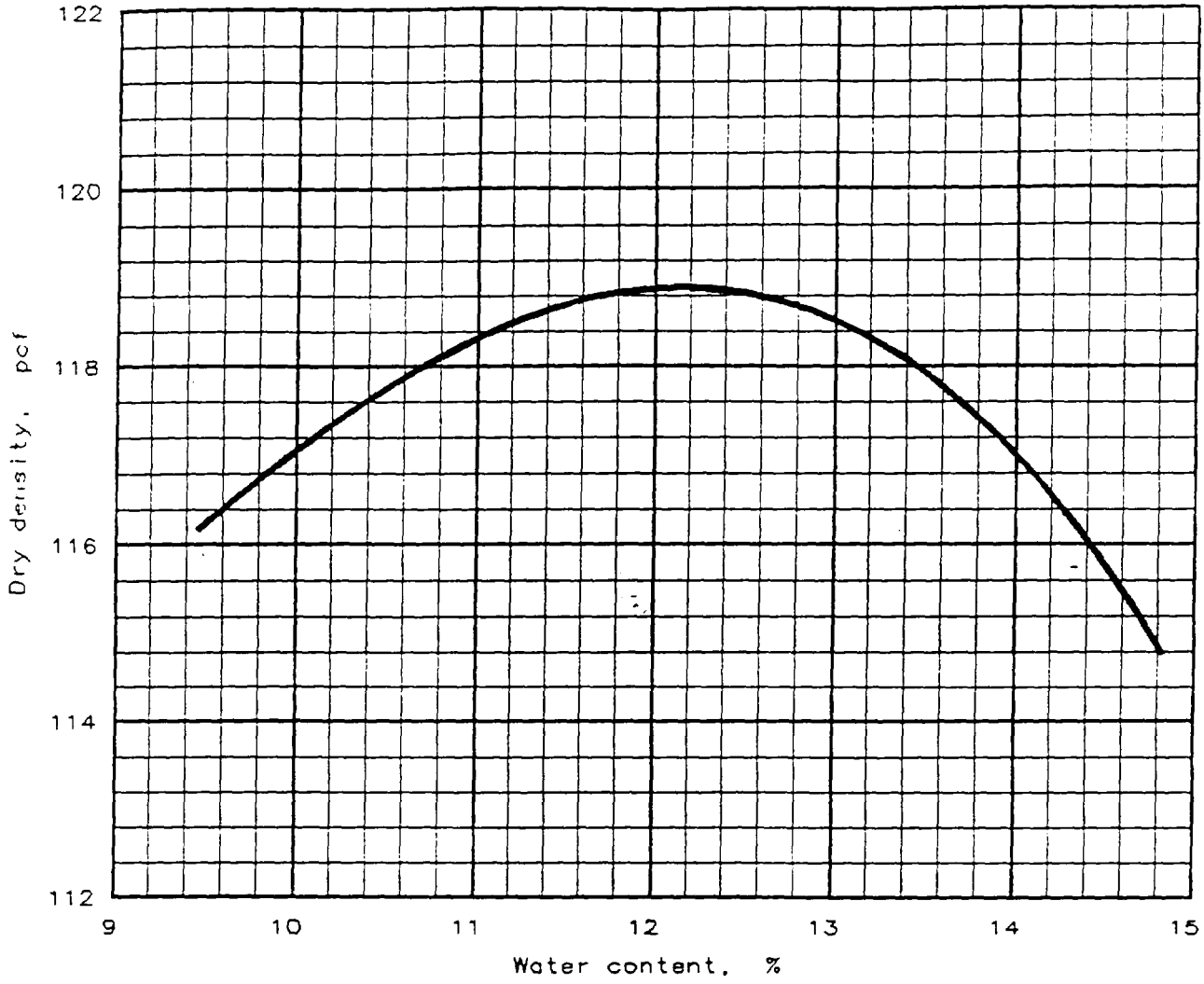
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			10.0 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.9 pcf Optimum moisture = 12.2 %	Gray SANDY SILT, Little Shale, Trace Clay, Organics

Project No.: A990298x1

Project: Melenium Inorganic

Location: 50' above Drive, 200' S from end of Drive, 30' W from end of drive

Date: 6-03-1999

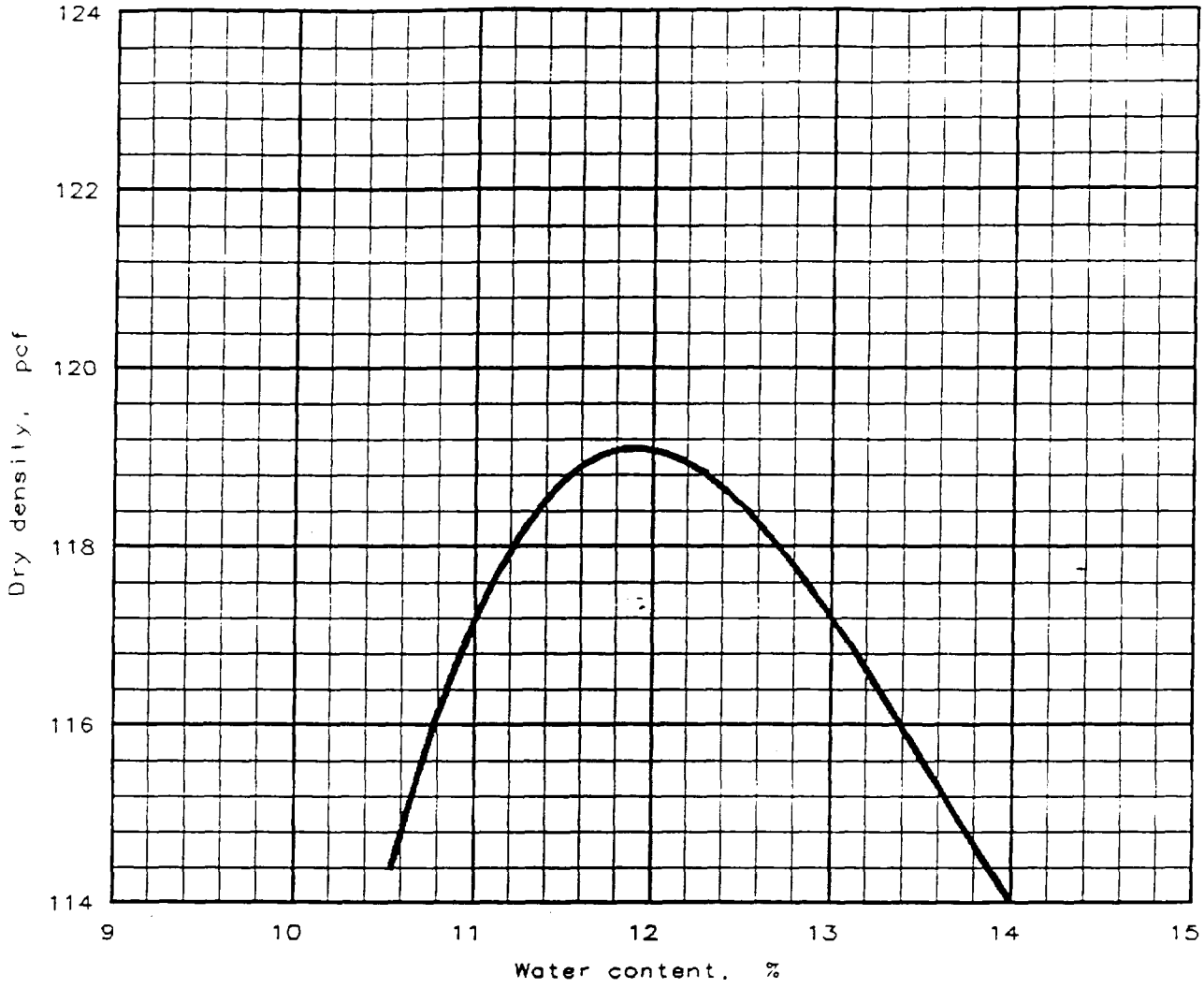
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			14.7 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 119.1 pcf Optimum moisture = 11.9 %	Mottled Br. & Gray SANDY SILT, Little Shale, Tr. Gravel, Organics, Clay, Glass

Project No.: A990298x1

Project: Melenium Inorganic

Location: NE end of Hill Cut, by Entrance to Hill

Date: 6-03-1999

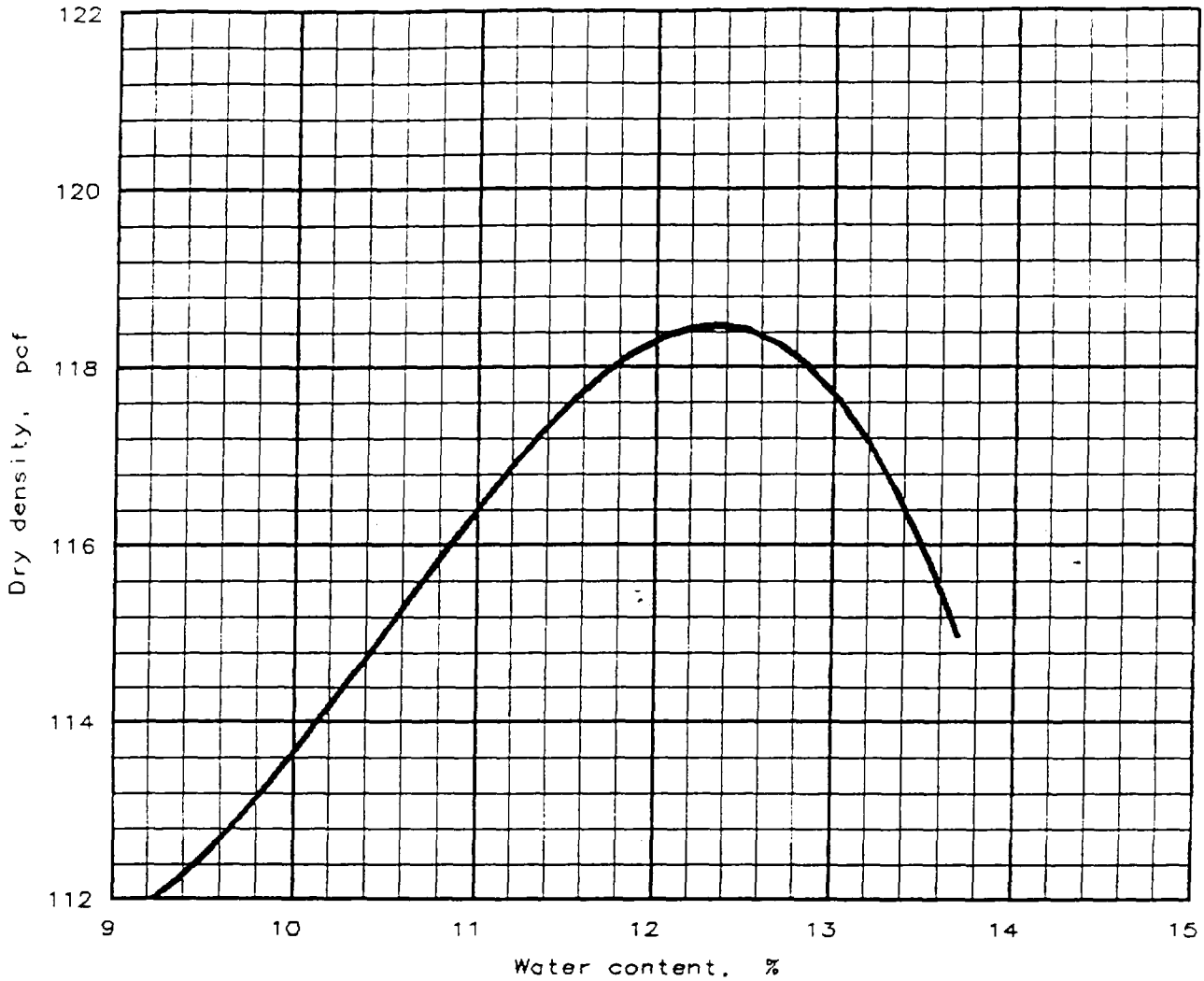
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			13.5 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.5 pcf Optimum moisture = 12.3 %	Brown SANDY SILT, Little Gravel, Trace Shale, Glass, Organics, Clay

Project No.: A990298x1

Project: Melenium Inorganic

Location: 8' above Drive, 75' S of Drive

Date: 6-03-1999

Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:6-17-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☑ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	6-16-99	1	Asphalt Compaction Report
1	6-17-99	2	Asphalt Lab Testing Results
1	-	4	Standard Proctor Curves 7 through 10
1	-	5	Table 1 Summary of Laboratory Testing (Std. Proctor)
1	6-16-99	6	Technician Time Tickets

THESE ARE TRANSMITTED AS CHECKED BELOW:

☑ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

ASPHALT COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Rebecca Wayne
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	June 16, 1999	Page 1/2
Activity:		
Asphalt Haul Road off of State Road		
and Middle Road		

Test Number	Material	Unit Weight pcf
1 through 7	402	144.6/147.4
		Design/Actual

Require % Compaction	96-98%

Test No.	Location	Elevation	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
1	36' E. of State Rd. / 7' S. of Centerline	Top of Base	145.1	100.3%	98.4%			
2	105' E. of State Rd. / 4' S. of Centerline	Top of Base	141.5	97.9%	96.0%			
3	187' E. of State Rd. / 3' S. of Centerline	Top of Base	140.0	96.8%	95.0%			
4	222' E. of State Rd. / 7' S. of Centerline	Top of Base	144.4	99.9%	98.0%			
5	258' N. of Middle Rd. / 2' E. of Centerline	Top of Base	144.3	99.8%	97.9%			
6	173' N. of Middle Rd. / 5' W. of Centerline	Top of Base	143.4	99.2%	97.3%			
7	95' N. of Middle Rd. / 6' E. of Centerline	Top of Base	143.7	99.4%	97.5%			
	Average		143.2	99.0%	97.2%		Pass (P)	

Comments:

Subcontractor: Velotta Paving

Temperature at paver 275 - 295 degrees F; behind paver where rolling 200 - 225 degrees F.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

ASPHALT COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Rebecca Wayne
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	June 16, 1999	Page 2/2
Activity:		
Asphalt Haul Road off of State Road and Middle Road		
Require % Compaction		96-98%

Test Number	Material	Unit Weight pcf
8 through 14	404	145.0/147.7
		Design/Actual

Test No.	Location	Elevation	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
8	20' E. of State Rd. / 6' N. of Centerline	Top of Pavement	144.2	99.4%	97.6%			
9	87' E. of State Rd. / 6' S. of Centerline	Top of Pavement	142.6	98.3%	96.5%			
10	149' E. of State Rd. / 1' N. of Centerline	Top of Pavement	143.5	98.9%	97.2%			
11	217' E. of State Rd. / 8' S. of Centerline	Top of Pavement	143.3	98.8%	97.0%			
12	223' N. of Middle Rd. / 7' W. of Centerline	Top of Pavement	145.5	100.3%	98.5%			
13	149' N. of Middle Rd. / 4' E. of Centerline	Top of Pavement	140.9	97.1%	95.4%			
14	31' N. of Middle Rd. / 8' W. of Centerline	Top of Pavement	144.5	99.6%	97.8%			
	Average		143.5	99.0%	97.2%		Pass (P)	

Comments:

Subcontractor: Velotta Paving

Temperature at paver 275 - 295 degrees F; behind paver where rolling 200 - 225 degrees F.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

ASPHALT LABORATORY TESTING
Extraction, Gradation, and Marshall Testing
402 404 Asphalt
June 16, 1999 / Grand River Asphalt

Project:	Millennium Inorganic Chemicals	Date:	June 17, 1999
Contractor:	Great Lakes Construction Company	Activity:	
Lab. Technician:	Mr. Jack Walsh		
Engineer:	Doug Perisutti, P.E.,CPG	Asphalt Laboratory Testing	
File Number:	A990289x24		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
402	147.4	2.362	97.2%	96-98%

Sieve Size	ODOT 402.02 Limits Percent	JMF Percent	Percent Passing
1.5"	100	100	100
1"	95-100	100	100
0.75"			90
0.5"	60-90	77	63
0.375"			55
#4	35-65	50	41
#8			35
#16	15-45	32	31
#30			26
#50	3-22	8	12
#100			5
#200	0-8	2.8	3
Asphalt Content	4.0 - 12.0%	5.7%	6.0%

Comments:

Subcontractor: Velotta Paving
The aggregates in this sample were limestone and natural sand.

SOLAR TESTING LABORATORIES, INC.

Douglas J. Perisutti, P.E., CPG

ASPHALT LABORATORY TESTING
Extraction, Gradation, and Marshall Testing
402 404 Asphalt
June 16, 1999 / Grand River Asphalt

Project:	**Millennium Inorganic Chemicals**	**Date:**	June 17, 1999
Contractor:	**Great Lakes Construction Company**	**Activity:**	
Lab. Technician:	**Mr. Jack Walsh**		
Engineer:	**Doug Perisutti, P.E.,CPG**	Asphalt Laboratory Testing	
File Number:	**A990289x24**		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
404	147.7	2.367	97.2%	96-98%

Sieve Size	ODOT 402.02 Limits Percent	JMF Percent	Percent Passing
1.5"	100	100	100
1"	95-100	100	100
0.75"			100
0.5"	60-90	77	87
0.375"			81
#4	35-65	50	56
#8			42
#16	15-45	32	36
#30			31
#50	3-22	8	17
#100			7
#200	0-8	2.8	4.5
Asphalt Content	4.0 - 12.0%	5.9%	5.9%

Comments:

Subcontractor: Velotta Paving
The aggregates in this sample were limestone and natural sand.

SOLAR TESTING LABORATORIES, INC.

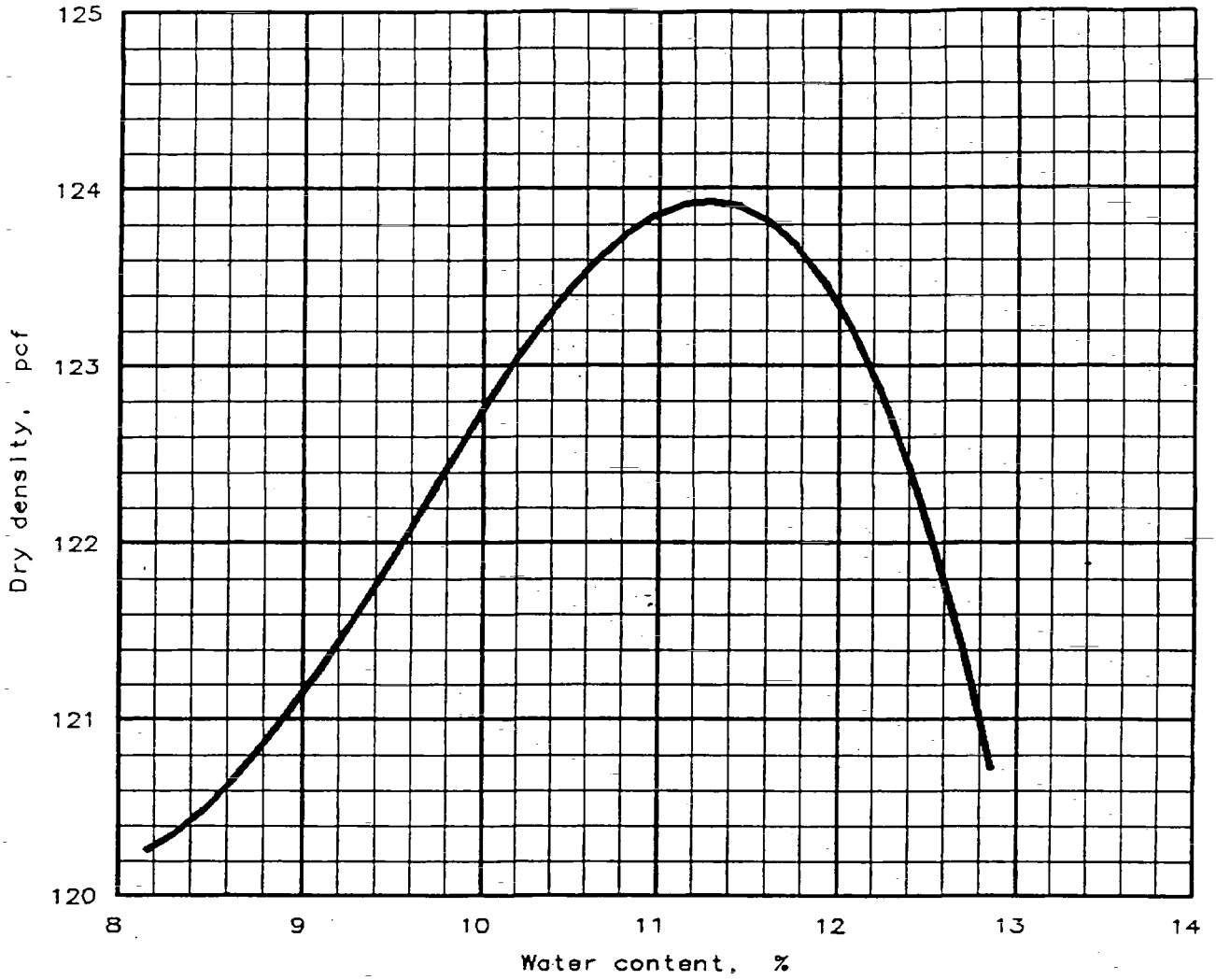
Douglas J. Perisutti, P.E., CPG

Table 1
Summary of Laboratory Soil Testing
Standard Proctor Tests
Millennium Inorganic Chemicals

Curve #	*Description*	*Maximum Dry Density pcf **	*Optimum Moisture %*	*Location*	*Date Collected*
1	Brown Sandy Silt, Little Clay, Gravel, Trace Organics, Shale (subgrade)	112.6	13.2	onsite	01-Jun-99
2	304 Limestone (subbase)	137.4	7.3	onsite	11-Jun-99
3	Gray Sandy Silt and Clay, Some Shale, Trace Gravel	124.9	10.6	Offsite Stockpile	01-Jun-99
4	Gray Sandy Silt, Little Shale, Trace Clay, **Organics**	118.9	12.2	Offsite Stockpile	01-Jun-99
5	Mottled Brown & Gray Sandy Silt, Little Shale, Tr. Gravel, **Organics**, Clay, Glass	119.1	11.9	Offsite Stockpile	01-Jun-99
6	Brown Sandy Silt, Little Gravel, Trace Shale, Glass, **Organics**, Clay	118.5	12.3	Offsite Stockpile	01-Jun-99
7	Gray Silty Clay, Some Sand, Little Shale, Trace Gravel	123.9	11.3	Offsite Stockpile	14-Jun-99
8	Mottled Brown & Gray Silt & Clay, Little Sand, Shale, Tr. Gravel, **Organics**	118.1	11.8	Offsite Stockpile	14-Jun-99
9	Gray Silt, Little Sand, Shale, Clay, Trace Gravel, Glass, **Organics**	118.3	13.6	Offsite Stockpile	14-Jun-99
10	Gray Silty Clay, Some Sand, Little Shale, Trace Gravel	123.1	11.0	Offsite Stockpile	14-Jun-99

SOLAR TESTING LABORATORIES, INC.

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			13.9 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.9 pcf Optimum moisture = 11.3 %	Gray SILTY CLAY, Some Sand, Little Shale, Trace Gravel

Project No.: A990298x1

Project: Millennium Inorganic

Location: 5' from top of Mound, 30' West of Road

Date: 6-16-1999

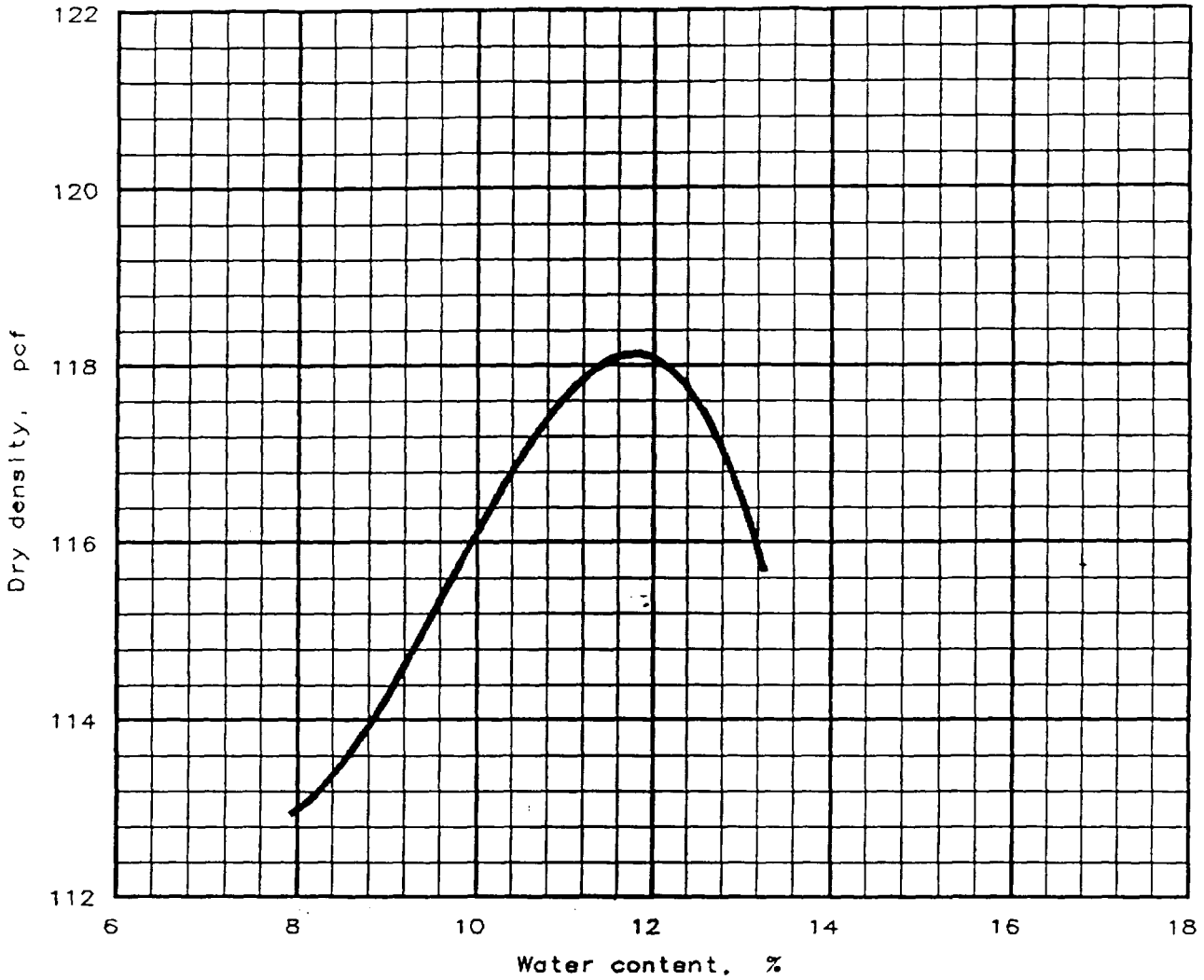
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			13.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.1 pcf Optimum moisture = 11.8 %	Mottled Brown & Gray SILT + CLAY, Little Sand, Shale,Tr. Gravel, Organic

Project No.: A990298x1

Project: Millennium Inorganic

Location: Borrow Pit, Right side 4-5' Deep

Date: 6-16-1999

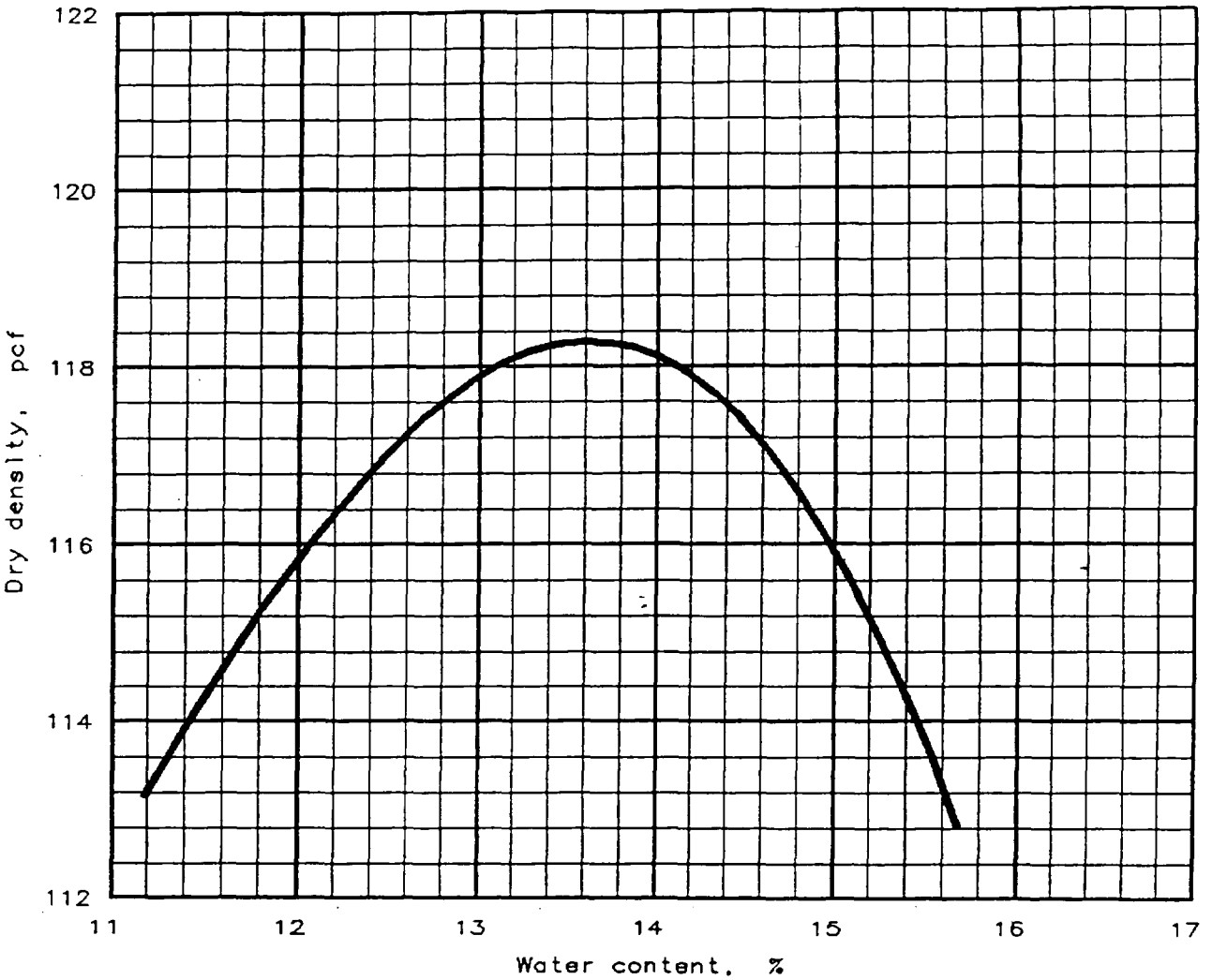
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			13.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.3 pcf Optimum moisture = 13.6 %	Gray SILT, Little Sand, Shale, Clay Trace Gravel, Glass, Organics

Project No.: A990298x1

Project: Millennium Inorganic

Location: Center of Mound 40' West of Road

Date: 6-16-1999

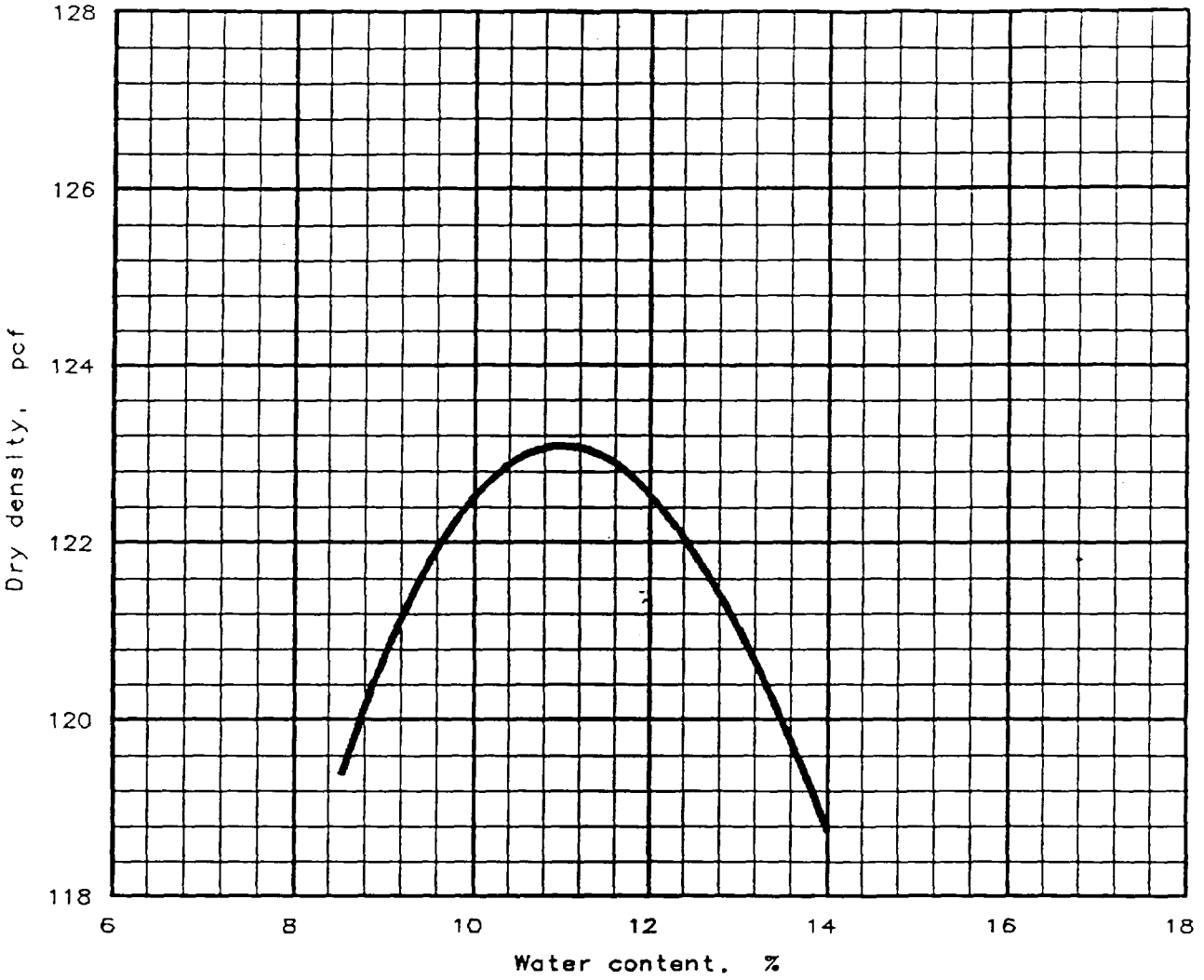
MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Remarks:

Fig. No. _____

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						
			14.1 %					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.1 pcf Optimum moisture = 11.0 %	Gray SILTY CLAY, Some Sand, Little Shale, Trace Gravel

Project No.: A990298x1

Project: Millennium Inorganic

Location: Top of South Edge of Site, 3' down - even with borrow pit

Date: 6-16-1999

Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

SOLAR TESTING LABORATORIES

Fig. No. _____

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:7-22-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☐ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	7-13-99	1	Soil Compaction Report (Therminol Tank Area)
1	7-14-99	1	Soil Compaction Report (Therminol Tank Area)
1	7-15-99	1	Soil Compaction Report (Therminol Tank Area)
1	-	1	Technician Time Tickets (July 13, 14, 15, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Schultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	July 13, 1999	Page 1/1
Activity:		
Therminol Tank Area		

Curve Number	Maximum Dry Density	% Opt. Moisture
6	118.5	12.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	439.57 N 343.12 E	628.6	120.1	10.0	101.4%	6	Pass (P)	
2	454.22 N 350.01 E	629.3	115.0	11.6	97.0%	6	Pass (P)	

Comments: Locations provided by surveyors
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Schultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	July 14, 1999	Page 1/1
Activity:		
Therminol Tank Area		

Curve Number	Maximum Dry Density	% Opt. Moisture
6	118.5	12.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location Therminol Tank Area	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	421.73 N 340.72 E	629.0	120.5	11.2	101.7%	6	Pass (P)	
2	469.36 N 342.89 E	630.7	116.4	12.6	98.2%	6	Pass (P)	
3	446.60 N 335.61 E	630.7	120.1	10.2	101.4%	6	Pass (P)	
4	447.56 N 341.07 E	630.9	118.6	11.8	100.1%	6	Pass (P)	
5	428.90 N 343.63 E	631.1	119.7	11.6	101.0%	6	Pass (P)	

Comments: Locations provided by surveyors
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Schultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	July 15, 1999	Page 1/1
Activity:		
Therminol Tank Area		

Curve Number	Maximum Dry Density	% Opt. Moisture
6	118.5	12.3
2	137.4	7.3
5	119.1	11.9

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location Therminol Tank Area	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	10.25' S 8.9' E of Building 41	631*	139.1	6.9	101.2%	2	Pass (P)	
2	440.79 N 306.70 E	630.6	116.7	11.9	98.5%	6	Pass (P)	
3	428.53 N 316.10 E	631.3	115.9	15.7	97.3%	5	Pass (P)	

Comments: Locations provided by surveyors except test #1 elevation was estimated.
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOLAR TESTING LABORATORIES, INC.
5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

352-99

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:9-1-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☐ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	8-20-99	1	Soil Compaction Report
1	8-23-99	1	Soil Compaction Report
1	8-23-99	1	Asphalt Compaction Report
1	-	1	Technician Time Tickets (August 20, 23, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

ASPHALT COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Wayne Dodson
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Aug. 23, 1999	Page 1/1
Activity:		
Asphalt Placement		
Require % Compaction		96-98%

Test Number	Material	Unit Weight pcf
1 through 8	402	144.6/147.4
		Design/Actual

Test No.	Location	Elevation from top of grade	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
1	6' west of gagage door #15	3" below	149.9	103.7%	101.7%			
2	6' west of sign 47 / 25' south of test #1	3" below	149.7	103.5%	101.6%			
3	30' west of sign 47	3" below	148.7	102.8%	100.9%			
4	30' west of garage door #15	3" below	148.6	102.8%	100.8%			
5	25' west of sign 41	3" below	146.0	101.0%	99.1%			
6	40' west of sign 41	3" below	145.7	100.8%	98.8%			
7	45' west of garage dooor #15	3" below	147.5	102.0%	100.1%			
8	51' west of sign 47	3" below	147.6	102.1%	100.1%			
	Average		147.7	102.1%	100.2%		P	

Comments:
Subcontractor: Velotta Paving

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. T. Lubera
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Aug 20, 1999	Page 1/1
Activity:		
Various Areas Pond Area (compaction testing)		

Curve Number	Maximum Dry Density	% Opt. Moisture
8	118.1	11.8

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	18' north of sewage filtration tank	628.5	117.1	13.0	99.2%	9	Pass (P)	
2	20' N / 30' E of NW corner of pond	628.5	109.1	18.1	92.4%	9	Fail (F)	
3	14' N / 60' E of NW corner of pond	628.5	108.1	17.4	91.5%	9	Fail (F)	

Comments:
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Wayne Dodson
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Aug 23, 1999	Page 1/1
Activity:		
Various Areas Pond Area (compaction testing)		

Curve Number	Maximum Dry Density	% Opt. Moisture
9	118.3	13.6

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	12' north of pond	4'	105.7	16.6	89.3%	9	Fail (F)	
2	Retest of test #1	4'	112.6	16.1	95.2%	9	Pass (P)	
3	25' east of test #2 / 14' north of pond	4'	118.9	14.4	100.5%	9	Pass (P)	
4	13' N. of pond / 35' E. of E. end of pond	3'	112.6	16.7	95.2%	9	Pass (P)	
5	37' east of test #4	3'	119.4	14.3	100.9%	9	Pass (P)	
6	12' north of pond	1' - 8"	113.9	13.8	96.3%	9	Pass (P)	
7	13' N. of pond / 40' E. of test #6	1' - 8"	118.3	14.6	100.0%	9	Pass (P)	
8	13' north of pond	8"	113.8	13.5	96.2%	9	Pass (P)	
9	13' N. of pond / 45' E. of test #8	8"	118.5	14.8	100.2%	9	Pass (P)	

Comments: Elevations estimated from assumed top of subgrade
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOLAR TESTING LABORATORIES, INC.
5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:9-29-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☒ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO	DESCRIPTION
1	9-23-99	1	Soil Compaction Report
1	9-23-99	1	Technician Time Ticket (September 23, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For your use ☐ For staking ☐ Drawings returned after loan to us

☒ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Tim Suduth
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Sept 23, 1999	Page 1/1
Activity:		

Curve Number	Maximum Dry Density	% Opt. Moisture
2	137.4	7.3
8	118.1	11.8

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	26' South of FP16 (304 limestone)	624	131.7	5.9	95.9%	2	Pass (P)	
2	304 limestone	624	130.4	6.5	94.9%	2	Pass (P)	assumed to pass
3	14' from stake 78 (Grid #57)	624	116.1	12.8	98.3%	8	Pass (P)	
4	Between Grids 242 & 127 (Grid #58)	623.5	117.2	10.5	99.2%	8	Pass (P)	
5	Center of Grid #50	629	113.6	13.0	96.2%	8	Pass (P)	
6	Center of Grid #60	629	113.6	13.7	96.2%	8	Pass (P)	

Comments:
Proctor curves matched with material by GLC

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:10-20-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☑ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	10-15-99	1	Soil Compaction Report
1	-	1	Technician Time Ticket (October 15, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☑ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Shultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990298x24

Date:	Oct 15, 1999	Page 1/1
Activity:		

Curve Number	Maximum Dry Density	% Opt. Moisture
7	123.9	11.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	N-544.0 E-1145.0	629.20	126.8	11.2	102.3%	7	Pass (P)	Tested at 9"
2	N-618.9 E-1120.0	627.30	127.8	11.4	103.1%	7	Pass (P)	Tested at 9"
3	N-566.4 E-1084.1	632.60	127.4	10.5	102.8%	7	Pass (P)	Tested at 7"
4	N-618.9 E-1120.0	626.14	122.0	10.7	98.5%	7	Pass (P)	Tested at 7"
5	N-610.2 E-1118.7	625.00	123.6	11.2	99.8%	7	Pass (P)	Tested at 9"
6	N-609.8 E-1117.8	623.20	128.3	9.9	103.6%	7	Pass (P)	Tested at 9"

Comments:

Proctor curves matched with material by GLC

Locations and elevation provided by surveyor.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOLAR TESTING LABORATORIES, INC.
5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:10-25-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☐ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	10-21-99	1	Soil Compaction Report
1	-	1	Technician Time Ticket (October 21, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED: _____

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOIL COMPACT. . REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Shultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990298x24

Date:	Oct 21, 1999	Page 1/1
Activity:		

Curve Number	Maximum Dry Density	% Opt. Moisture
7	123.9	11.3
8	118.1	11.8
2	137.4	7.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	N-544.1 E-1190.3	632.40	121.9	11.8	98.4%	7	Pass (P)	Tested at 9"
2	N-539.6 E-1257.6	632.60	122.2	13.6	98.6%	7	Pass (P)	Tested at 7"
3	N-535.4 E-932.6	624.80	117.1	13.3	99.2%	8	Pass (P)	
4	N-581.5 E-928.6	624.20	119.9	14.2	101.5%	8	Pass (P)	
5	N-665.7 E-920.3	624.50	108.5	13.0	91.9%	8	Fail (F)	
6	N-686.9 E-918.5	624.10	123.2	10.7	99.4%	7	Pass (P)	
7	Area B see note	finish	-	-	-	-	-	
8	Area D see note	finish	89.0	13.3	64.8%	2	Fail (F)	
9	Parking Lot / 66' S of concrete	finish	134.0	6.2	97.5%	2	Pass (P)	Tested at 3"
10	18' W of E edge/66' S of concrete	finish	135.1	4.7	98.3%	2	Pass (P)	Tested at 3"
11	15' E of W edge/93' N of CB	finish	139.3	6.5	101.4%	2	Pass (P)	Tested at 3"
12	101' N of S edge/84' E of cooling tower	finish	137.2	5.9	99.9%	2	Pass (P)	Tested at 3"
13	Area B	finish	135.5	7.0	98.6%	2	Pass (P)	Tested at 7"

Comments: Test 9 through 12 are in parking lot area. Areas D & B are to be re-excavated and add #57 stone, re-rolled and tested. Proctor curves matched with material by GLC
Locations and elevation provided by surveyor.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Shultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990298x24

Date:	Oct 21, 1999	Page 1/1
Activity:		

Curve Number	Maximum Dry Density	% Opt. Moisture
7	123.9	11.3
8	118.1	11.8
2	137.4	7.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	N-544.1 E-1190.3	632.40	121.9	11.8	98.4%	7	Pass (P)	Tested at 9"
2	N-539.6 E-1257.6	632.60	122.2	13.6	98.6%	7	Pass (P)	Tested at 7"
3	N-535.4 E-932.6	624.80	117.1	13.3	99.2%	8	Pass (P)	
4	N-581.5 E-928.6	624.20	119.9	14.2	101.5%	8	Pass (P)	
5	N-665.7 E-920.3	624.50	108.5	13.0	91.9%	8	Fail (F)	
6	N-686.9 E-918.5	624.10	123.2	10.7	99.4%	7	Pass (P)	
7	Area B see note	finish	-	-	-	-	-	
8	Area D see note	finish	89.0	13.3	64.8%	2	Fail (F)	
9	Parking Lot / 66' S of concrete	finish	134.0	6.2	97.5%	2	Pass (P)	Tested at 3"
10	18' W of E edge/66' S of concrete	finish	135.1	4.7	98.3%	2	Pass (P)	Tested at 3"
11	15' E of W edge/93' N of CB	finish	139.3	6.5	101.4%	2	Pass (P)	Tested at 3"
12	101' N of S edge/84' E of cooling tower	finish	137.2	5.9	99.9%	2	Pass (P)	Tested at 3"
13	Area B	finish	135.5	7.0	98.6%	2	Pass (P)	Tested at 7"

Comments: Test 9 through 12 are in parking lot area. Areas D & B are to be re-excavated and add #57 stone, re-rolled and tested. Proctor curves matched with material by GLC

Locations and elevation provided by surveyor.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Shultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990298x24

Date:	Oct 21, 1999	Page 1/1
Activity:		

Curve Number	Maximum Dry Density	% Opt. Moisture
7	123.9	11.3
8	118.1	11.8
2	137.4	7.3

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	N-544.1 E-1190.3	632.40	121.9	11.8	98.4%	7	Pass (P)	Tested at 9"
2	N-539.6 E-1257.6	632.60	122.2	13.6	98.6%	7	Pass (P)	Tested at 7"
3	N-535.4 E-932.6	624.80	117.1	13.3	99.2%	8	Pass (P)	
4	N-581.5 E-928.6	624.20	119.9	14.2	101.5%	8	Pass (P)	
5	N-665.7 E-920.3	624.50	108.5	13.0	91.9%	8	Fail (F)	
6	N-686.9 E-918.5	624.10	123.2	10.7	99.4%	7	Pass (P)	
7	Area B see note	finish	-	-	-	-	-	
8	Area D see note	finish	89.0	13.3	64.8%	2	Fail (F)	
9	Parking Lot / 66' S of concrete	finish	134.0	6.2	97.5%	2	Pass (P)	Tested at 3"
10	18' W of E edge/66' S of concrete	finish	135.1	4.7	98.3%	2	Pass (P)	Tested at 3"
11	15' E of W edge/93' N of CB	finish	139.3	6.5	101.4%	2	Pass (P)	Tested at 3"
12	101' N of S edge/84' E of cooling tower	finish	137.2	5.9	99.9%	2	Pass (P)	Tested at 3"
13	Area B	finish	135.5	7.0	98.6%	2	Pass (P)	Tested at 7"

Comments: Test 9 through 12 are in parking lot area. Areas D & B are to be re-excavated and add #57 stone, re-rolled and tested. Proctor curves matched with material by GLC

Locations and elevation provided by surveyor.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOLAR TESTING LABORATORIES, INC.
5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	DATE:11-4-99	FILE NO. A990298x24
6600 East Schaaf Road	ATTN: Mr. Mark Bacon	
P.O. Box 318055	RE: Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☒ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	10-29-99	1	Asphalt Compaction Report
1	-	2	Technician Time Ticket (October 29, 1999)
1	11-1-99	3	Asphalt Laboratory Testing Results

THESE ARE TRANSMITTED AS CHECKED BELOW:

☒ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

ASPHALT COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Tim Sudduth
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Oct. 29, 1999	Page 1/2
Activity:		
Asphalt Placement		
Require % Compaction		96-98%

Test Number	Material	Unit Weight pcf
1	402	144.6/147.5
2	403/404	143.0/140.1
		Design/Actual

Test No.	Location	Elevation from top of grade	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
1	20' E of NW corner /8' S of concrete	633.74	143.0	98.9%	96.9%		P	402
2	16' from N edge / 100' E of W end	633.74	148.1	102.4%	100.4%		P	402
3	12' from N edge / 102' E of W end	633.74	144.7	100.1%	98.1%		P	retest of #2 (404)
4	15' S of N edge / 190' E of W edge	633.74	144.3	99.8%	97.8%		P	402
5	48' E of W edge / 4' N of S edge (line 1)	633.94	142.2	99.4%	101.5%		P	404
6	16' N of S edge / 42' E of W edge (line 2)	633.94	141.0	98.6%	100.6%		P	404
7	15' N of S edge / 30' W of E edge (line 2)	633.94	140.3	98.1%	100.1%		P	404
8	26' N of S edge / 134' E of W edge (line 3)	633.94	138.8	97.1%	99.1%		P	404
9	26' N of S edge / 26' W of E edge (line 4)	633.94	142.1	99.4%	101.4%		P	404
10	100' W of E edge / 40' N of S edge (line 5)	633.94	139.2	97.3%	99.4%		P	404
11	40' N of S edge / 28' E of W edge (line 5)	633.94	138.2	96.6%	98.6%		P	404
12	50' N of S edge / 30' E of W edge (line 6)	633.94	139.2	97.3%	99.4%		P	404
13	62' N of S edge / 114' E of W edge (line 7)	633.94	136.2	95.2%	97.2%		P	404
14	64' W of E edge / 79' N of S edge (line 8)	633.94	141.5	99.0%	101.0%		P	404
15	56' E of W edge / 72' N of S edge (line 8)	633.94	139.8	97.8%	99.8%		P	404

Comments:

Subcontractor: Velotta Paving

All distances are from existing concrete.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Tim Sudduth
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Oct. 29, 1999	Page 2/2
Activity:		
Asphalt Placement		
Require % Compaction		96-98%

Test Number	Material	Unit Weight pcf
1	402	144.6/147.5
2	403/404	143.0/140.1
		Design/Actual

Test No.	Location	Elevation from top of grade	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
16	86' N of S edge / 170' E of W edge (line 9)	633.94	140.3	98.1%	100.1%		P	404
17	94' N of S edge / 114' E of W edge (line 10)	633.94	139.8	97.8%	99.8%		P	404
18	100' N of S edge / 114' E of W edge (line 11)	633.94	137.4	96.1%	98.1%		P	404
19	108' N of S edge / 270' E of W edge (line 11)	633.94	137.6	96.2%	98.2%		P	404
20	116' N of S edge / 270' E of W edge (line 12)	633.94	138.6	96.9%	98.9%		P	404
21	174' E of W edge / 124' N of S edge (line 13)	633.94	136.7	95.6%	97.6%		P	404

Comments:

Subcontractor: Velotta Paving

All distances are from existing concrete.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

ASPHALT LABORATORY TESTING
Extraction, Gradation, and Marshall Testing
402 404 Asphalt
November 1, 1999 / Grand River Asphalt

Project:	**Millennium Inorganic Chemicals**	**Date:**	Nov. 1, 1999
Contractor:	**Great Lakes Construction Company**	**Activity:**	
Lab. Technician:	**Mr. Jack Walsh**		
Engineer:	**Doug Perisutti, P.E.,CPG**	Asphalt Laboratory Testing	
File Number:	**A990289x24**		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
402	147.5	2.364	98.3%	96-98%

Sieve Size	ODOT 402.02 Limits Percent	JMF Percent	Percent Passing
1.5"	100	100	100
1"	95-100	100	100
0.75"			93
0.5"	60-90	77	69
0.375"			62
#4	35-65	50	47
#8			40
#16	15-45	32	35
#30			29
#50	3-22	8	16
#100			6
#200	0-8	2.8	3.5
Asphalt Content	4.0 - 12.0%	5.7%	6.3%

Comments:

Material is composed of limestone and natural sand
Average in-place density from October 29, 1999

SOLAR TESTING LABORATORIES, INC.

Douglas J. Perisutti, P.E., CPG

ASPHALT LABORATORY TESTING
Extraction, Gradation, and Marshall Testing
402 404 Asphalt
November 1, 1999 / Grand River Asphalt

Project:	**Millennium Inorganic Chemicals**	**Date:**	Nov. 1, 1999
Contractor:	**Great Lakes Construction Company**	**Activity:**	
Lab. Technician:	**Mr. Jack Walsh**		
Engineer:	**Doug Perisutti, P.E.,CPG**	Asphalt Laboratory Testing	
File Number:	**A990289x24**		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
404	140.1	2.245	99.5%	96-98%

Sieve Size	ODOT 404.02 Limits Percent	JMF Percent	Percent Passing
0.5"	100	100	100
0.375"	90-100	94	98
#4	45-75	60	65
#8			52
#16	25-45	37	46
#30			39
#50	3-22	11	14
#100			5
#200	0-8	3.0	3.4
Asphalt Content	4.5 - 12.0%	6.2%	6.1%

Comments:

Material is composed of limestone and natural sand
Average in-place density from October 29, 1999

SOLAR TESTING LABORATORIES, INC.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

5399 LANCASTER DRIVE
BROOKLYN HEIGHTS, OHIO 44131
PHONE: (216) 741-7007
FAX: (216) 741-7011

LETTER OF TRANSMITTAL

TO: Great Lakes Construction Company	**DATE:**8-23-99	FILE NO. A990298x24
6600 East Schaaf Road	**ATTN:** Mr. Mark Bacon	
P.O. Box 318055	**RE:** Millennium Inorganic Chemicals	
Independence, Ohio 44131-8055		

WE ARE SENDING YOU ATTACHED THE FOLLOWING:

☒ Report ☐ Logs ☐ Proposal ☐ Letter

☐ Samples ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	8-11-99	1	Soil Compaction Report (Various Areas)
1	8-11-99	1	Technician Time Ticket (August 11, 1999)

THESE ARE TRANSMITTED AS CHECKED BELOW:

☒ For your use ☐ For staking ☐ Drawings returned after loan to us

☐ As requested ☐ For the following testing ☐ Other

REMARKS _____

SIGNED:

Douglas J. Perisutti, P.E., CPG
Environmental Project Engineer

COPY TO:

SOIL COM TION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Ms. Janet Schultz
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date:	Aug 11, 1999	Page 1/1
Activity:		
Various Areas (compaction testing)		

Curve Number	Maximum Dry Density	% Opt. Moisture
1	137.4	7.3
6	120.7	12.1

Require % Compaction	95%
Require % Moisture	none
Standard Proctor (check)	x
Modified Proctor (check)	

Test No.	Location	Elevation	In-Place Dry Density (pcf)	% Field Moisture	Percent Compaction	Curve Number	Pass (P) Fail (F)	Notes:
1	Therminol Tank Area	632.50	130.5	4.5	95.0%	1	Pass (P)	Tested @ 6-inches
2	20 feet from CB	632.50	138.3	5.1	100.7%	1	Pass (P)	backscatter
3	40' from 41-15 Bldg / 30' from drive	632.50	129.8	6.2	94.5%	1	Fail (F)	backscatter
4	25' from 41-15 Bldg / 35' from drive	632.50	133.5	4.7	97.2%	1	Pass (P)	Tested @ 4-inches
5	Middle of Area C	632.50	137.1	8.8	99.8%	1	Pass (P)	backscatter
6	Area C / 10' from steps	632.50	135.8	9.3	98.8%	1	Pass (P)	backscatter
7	25' North of point 141	635.00	120.2	11.3	99.6%	6	Pass (P)	Area overfilled
8	25' North of point 263	635.00	115.8	11.2	95.9%	6	Pass (P)	Area overfilled

Comments: Locations and elevations provided by surveyors except tests #1 - # 6
Proctor curves matched with material by GLC
Tests #1 - #6 locations and elevations estimated.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

LSM 50 DESIGN MIX

Frenchs' Inc.

204 East Main Street
Box 1330
Andover, Ohio 44003
(440) 293-6133

July 6, 1999

Great Lakes Construction
6600 Schaff Rd.
Cleveland, OH 44131
216-524-2970 Fax - 216-642-8693

Attn: Project Engineer
Re: Millinium Tickle Plant (Fill)

MIX #273 LSM 50 (LOW STRENGTH MORTAR)

Essroc Type 1 Cement	50 LB/CY
ISG Resources Type F-Flyash	250 LB/CY
Lakeland Concrete Sand	2964 LB/CY
Water	60 GAL./CY

MIX #272 LSM 100

Essroc Type 1 Cement	100 LB/CY
ISG Resources Type F-Flyash	250 LB/CY
Lakeland Concrete Sand	2934 LB/CY
Water	60 GAL.CY

Thank you.

Ed Kozlowski

Ed Kozlowski
Frenchs' Inc.

APPENDIX D
CONSTRUCTION QUALITY ASSURANCE REPORTS

APPENDIX D
CONSTRUCTION QUALITY ASSURANCE DATA

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 22OCT98	INSPECTION NO.: MIC-001	WEATHER: OVERCAST 45°F
SITE: MILLENNIUM TACLY PLANT		CONTRACTOR: AWS REMEDIATION, INC.

MANPOWER	
BRIEN KILKENNY (SUPER.)	HERB DAVIDSON
HARRY ("NICK") MOYER	
STEVE WIZMIRWSKI	
CRAIG KRUKOWSKI	
KEVIN ANTHONY	

~~CAT 311B~~ MAJOR EQUIPMENT ON-SITE	
CAT 311D TRACK HOE	STONE WALK BEHIND ROLLER
CAT D3C DOZER	
2-10 YRD DUMPS	
CAT BACKHOE LOADER/PLATE TAMPER	
CAT IT24F LOADER	
BOBCAT X325 TRACK HOE	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

AWS MOBILIZED EQUIPMENT AND MATERIALS TO SITE. SET UP DECON PAD AT EAST CENTRAL PORTION OF EXCAVATION AREA. DECON PAD LINES UP WITH EASTERN EDGE OF EXCAVATION. BEGAN STRIPPING GRAVEL FROM EAST FACE OF CLARIFIER. FILLED SAND BAGS TO BE USED TO PROTECT DE-NUDED AREAS. RE-WORKED STOCKPILE AREA TO RECEIVE EXCAVATED MATERIAL

SIGNED: (CQA INSPECTOR) 10-22-98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10-23-92	INSPECTION NO.: MIC-002	WEATHER: CLEAR / MILD 62°
SITE: CLARIFIER AREA - INTERIM		CONTRACTOR: AWS

MANPOWER	
SURVEY: (2) SHARP - VERIFICATION	
(2) WESTFALL - LAYOUT	
AWS: (2) FITTERS (1) TEAMSTER	
(3) OPERATORS (3) LABORERS	
(1) WF - SUPER (4) CEO'S	

MAJOR EQUIPMENT ON-SITE	
(3) END DUMPS	
(1) 966 LOADER (FE)	
(1) 911 B.HOE	
(1) D3	
(1) BOBCAT W/ DOZER	
(1) TRUCK CRANE	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- REMOVED 4 SECTIONS OF PIPE + PEDESTALS FROM FDN'S
- BEGAN EXCAV. NORTH WORKING SOUTH
- CONTINUAL ~~EXC~~ SURVEY DURING EXCAV. / THEN VERIFICATION
- ESTABLISHED EXCLUSION ZONES @ STOCKPILE AND CLARIFIER AREAS
-

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/24/98	INSPECTION NO.: MIC - 003	WEATHER: Clear 60°-65°
SITE: MIC Clarifier Area		CONTRACTOR: AWS

MANPOWER	
AWS: 3 CEOs, 1 Superintendent,	EDP: Soil Technician
5 - Laborers/Operators	
Westfall: 1 Instrument Man, 1	
Rodman	
Sharp: 1 Instrument Man, 1	
Rodman	

MAJOR EQUIPMENT ON-SITE	
2 - 6 cy End Dumps	CAT IT 24 Loader
CAT 311 B Excavator	
CAT D3 Dozer	
Bobcat Excavator	
CAT 416 B Loader/Hoe	
Ing-Rand 70 Smooth Drum Roller	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Continued and completed excavation in Grid ~~127~~ 131. Survey verified and backfill from the MIC landfill was placed in 12" lifts and compacted. Borrow material contained some wood which was removed by AWS personnel.

Excavation continued in Grid 127 and progressed south to the clarifier pipe. All material north of the clarifier ~~was~~ pipe removed and the area verified by survey. Backfill was placed in Grid 127 in 12" lifts, compacted and compaction tested by Gary Adkins of EDP. All material was tested for 95% compaction

SIGNED: (CQA INSPECTOR) [illegible] 10/24/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-003	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

per Modified Proctor ASTM using a value of 124.5 pcf obtained from the July 1998 EDP soils report on the MIC landfill borrow material.
All excavated soil is being transported and placed in an area immediately south of the concrete pad at the Mining Residuals Pile (MRP). CAT IT 24 Loader is being used to help place material.

AWS has informed me that they do not intend to excavate material directly beneath the clarifier pipe because it is not easily accessible and they are concerned that the pipe may collapse. I informed them that they should as-built the area they do not intend to excavate and address the issue with Millennium on 10/25.

Excavation continued into Grid 129. AWS shut down at 9:00 pm

Visitors on-site: Don Looney - MIC

SIGNED: (CQA INSPECTOR) [signature] 10/25/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/25/98	**INSPECTION NO.:** MIC-004	**WEATHER:** Clear, 60 - 65°F
SITE: MIC Clarifier Area		**CONTRACTOR:** AWS

MANPOWER	
AWS: President, Superintendent, 5 - Laborers/Operators	
Westfall: Instrument Man, Rodman	
Sharp: Instrument Man, Rodman	
EDP: Senior Soil Technician	
Halman: Superintendent, 2 - Pipefitters	

MAJOR EQUIPMENT ON-SITE	
2 - 6 cy End Dumps	CAT IT24 Loader
CAT 311B Excavator	
CAT D3 Dozer	
Bobcat Excavator	
CAT 416B Loader/Hoe	
Ingersoll Rand 70 Smooth Drum Compactor	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Continued excavation in Grid 129. Josef Shehabi and Paul Findlay arrived on-site at approximately 8:00 AM. I addressed the issue that AWS had stated they do not plan to excavate material beneath the clarifier pipe due to concerns of it collapsing. Both Josef and Paul decided that the material must be removed and that AWS do whatever it takes to remove the soil. As a result, AWS contacted their mechanical contractor, Halman Inc., to help determine how to deal with the pipe issue. Halman arrived and determined that one pipe support may be removed to excavate beneath the pipe and that if the other two can be saved, then collapse of the pipe would not be an issue. AWS was able to carry this out and successfully removed all required material from beneath the pipe.

Backfill was completed in grid 131 (north end). The area was restored with six-inches of gravel.

Several loads of backfill material to be placed in Grid 127 contained mostly topsoil and were unacceptable as backfill. I informed Herb Davidson of the situation and he sent back a truckload and gave instructions to the excavator operator to change areas for borrow. Material improved on the next load. One load of topsoil material was permitted to be blended well with the other soil and

SIGNED: (CQA INSPECTOR) [signature] 10/29/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC - 004	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

no problems were encountered achieving compaction with that soil.

All excavaton was completed in all Interim Measures areas. Survey verified excavation design depths. Shift was completed at approximately 7:15 PM.

Westfall began to topo the backfill area in Grid 127 when Paul Findlay informed me that MIC has no use for the topo and if I could not justify a reason why the EPA would require a topo in the completion report, he did not want it done. Therefore Westfall was informed not to perform the topo.

Visitors on-site: Paul Findlay - MIC, Josef Shehabi - MIC, Phil Kowallec - ALM, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 10/29/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/26/98	**INSPECTION NO.:** MIC-005	**WEATHER:** P. Cloudy, 65 - 70°F
SITE: MIC Clarifier Area		**CONTRACTOR:** AWS

MANPOWER	
AWS: President, Superintendent, 4 - Laborers/Operators	
EDP: Senior Soil Technician	
Halman: 2 - Pipefitters	

MAJOR EQUIPMENT ON-SITE	
2 - 6 cy End Dumps	CAT IT24 Loader
CAT 311B Excavator	
CAT D3 Dozer	
Bobcat Excavator	
CAT 416B Loader/Hoe	
Ingersoll Rand 70 Smooth Drum Compactor	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Began placement of flowable fill. MIC personnel were pumping water the day before and water that leaked from their soft hoses has worked its way through the gravel and sand and found its way to the excavation. The flowable fill is displacing the water, but the water will require pumping to assist the flowable fill in curing. Sonotubes were set where the new concrete piers will be poured for the clarifier pipe supports. The sonotubes were filled with 4000 psi concrete and rebar by Halman employees. Several trucks of 4000 psi quick setting concrete were placed around the sonotubes to ensure the area will have structural integrity within a day so that the clarifier pipe can be put on-line as scheduled.

A majority of the excavation was backfilled with flowable fill to within approximately three feet of final grade. Most of the water was chased to the south end of the fill, but was not pumped down at the end of the shift.

All backfill north of the clarifier pipe is to grade and has all been successfully compaction tested.

Visitors - Mark McIntyre - MIC, Paul Findlay - MIC, Phil Kowallec - ALM, Rick Hughes - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 10/29/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/27/98	**INSPECTION NO.:** MIC-006	**WEATHER:** P. Cloudy, 65 - 70°F
SITE: MIC Clarifier Area		**CONTRACTOR:** AWS

MANPOWER	
AWS: President, Superintendent, 4 - Laborers/Operators	
EDP: Senior Soil Technician	
Halman: Superintendent, 4 - Pipefitters	
Westfall: Instrument Man, Rodman	

MAJOR EQUIPMENT ON-SITE	
2 - 6 cy End Dumps	CAT IT24 Loader
CAT 311B Excavator	
CAT D3 Dozer	
Bobcat Excavator	
CAT 416B Loader/Hoe	
Ingersoll Rand 70 Smooth Drum Compactor	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Placed backfill over flowable fill. Fill has not cured well at the south end of Grid 131 due to excessive water. A sump hole was dug and the water was pumped out. AWS then mixed dry cement in with the material which quickly helped stabilize the area.

Backfill was completed and compaction tested.

Halman completed restoration of clarifier pipe. Pipe is ready to receive water from clarifier.

Placed six inch soil cover over the new waste pile at the MRP. Some discussion occurred as to whether some erosion control should be placed over the cover, but none was put on. Westfall located waste pile by survey.

Visitors on-site: Don Rooney - MIC, Phil Kowallec - ALM, Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) Jeffrey Kyle 10/27/98

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/1/99	INSPECTION NO.: MK-007	WEATHER: overcast, 60-75°F, occ. light rain
SITE: Millennium $TiCl_4$ Plant Remedial Action Ashtabula, Ohio		CONTRACTOR: Great Lakes Cons. (GLC)

MANPOWER	
GLC - Supervisor, 4 - laborers/Operators	
Solar Testing - 1 tech	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC excavator #R98	
Komatsu D65EX dozer #D601R	
Cat 938G loader #L422R	
Ingersoll Rand roller #EC 239 R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Fencing material delivered to site
- Excavating equipment moved from NE haul road to SE haul rd. area
- Excavated SE haul road from Middle Rd. to RR tracks N of office area
- Rolled excavated SE haul road
- Soil from SE haul road stockpiled in Contractor's parking lot across from Millennium Plant II entrance
- Solar on site to obtain samples at landfill for proctor

SIGNED: (CQA INSPECTOR) Al Brillinger 6/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/2/99	INSPECTION NO.: MIC-008	WEATHER: Cloudy - p. cloudy 65-75° heavy rain 0740-0800 & 11:40-12:10
SITE: Millemium $TiCl_4$ Plant Remedial Action Ashtabula Ohio		CONTRACTOR: Great Lakes Cons (GLC)

~~GLC~~ MANPOWER	
GLC - Supervisor, 4 - Laborers / Operators	
Solar Testing - 1 - Tech.	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC 220LC Excavator #R98	
Komatsu D65EX dozer #D601R	
Cat 938G loader #L422R	
Ingersoll Rand vib. roller #EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Layout geotextile for parking area by office trailers
- Place crushed gravel & gravel on geotextile (~4-6" thick) for parking area by office trailers
- Rolled parking area
- Heavy rain 7:40-8:00, 11:40-12:10, 3:15-3:30

SIGNED: (CQA INSPECTOR) Al Brullenger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/3/99	INSPECTION NO.: MIC-009	WEATHER: overcast, 60-65°F, occ. light mist
SITE: Millennium $TiCl_4$ Plant Remedial Action Ashtabula, Ohio		CONTRACTOR: Great Lakes Construction (GLC)

MANPOWER	
· GLC - 1 supervisor	

MAJOR EQUIPMENT ON-SITE	
· Komatsu PC220LC Excavator #R98	
· Komatsu D65EX dozer #D601R	
· Cat 938G loader #L422R	
· Ingersoll Rand vib. roller # EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

· GLC performed no work on site today.

SIGNED: (CQA INSPECTOR) Allan B Bullinger 6/3/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/4/99	INSPECTION NO.: MIC-010	WEATHER: P. cloudy - sunny 50-65°F
SITE: Millennium $TiCl_4$ Plant Remedial Action Ashtabula Ohio		CONTRACTOR: Great Lakes Cons. (GLC)

MANPOWER	
· GLC → 1 supervisor, 5 operators/laborers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC 220 LC Excavator # R98	
Komatsu D65 EX dozer # D601 R	
Cat 938G loader # L422 R	
Ingersoll Rand vib. roller # EC739 R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

· Pipe installed across apron of NW haul rd & State Rd.
· Installed 12" RCP instead of 18" corr. pipe as per Don Rooney
· Catch basin installed at upstream junction of clay pipe & RCP
· Bottom of catch basin cut off so that it would clear larger clay pipe ~ 5½' below installed pipe.
· Catch basin bottom replaced w/ placed concrete, ~~to~~ outside of catch basin backfilled w/ placed concrete, areas between pipe & catch basin filled w/ placed concrete.
· pipe excavation backfilled w/ crushed limestone & compacted with jumping jack.

SIGNED: (CQA INSPECTOR) Allan B. Brillinger 6/4/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/7/99	**INSPECTION NO.:** MIC-011	**WEATHER:** Hazy, Humid 85 - 90°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Superintendent, Health & Safety Officer	
Thomas Fence: 2-Laborers	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

GLC had Thomas Fence on-site to remove the gate and fencing on the SE corner of the property. Once the required areas of fence were removed, post holes for the new fence were laid out and excavated. The posts were set and anchored with concrete. This was the only work performed on-site.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/7/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/8/99	**INSPECTION NO.:** MIC-012	**WEATHER:** Sunny, Humid 85 - 90°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Superintendent, Health & Safety Officer, Operator	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

No QA personnel were on-site today. MK was informed that the only work performed was the stripping of material to make way for the SE haul road. A soft area was discovered just south of the MIC train tracks. This area was excavated and upon excavation it quickly filled with water. The area was pumped down and left to be evaluated the following day.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 6/8/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/9/99	**INSPECTION NO.:** MIC-013	**WEATHER:** Clear, 85°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Superintendent	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

No work was performed today. It was noted however the portion of the subgrade that was very soft filled again with water twice after being pumped down. It was determined that the entire soft area should be excavated an additional foot and filled with one-inch stone. The stone will extend beyond the road to the west so that it may be daylighted to drain in the future if necessary. The stone will also extend beyond the road to the east, where a small sump will be installed so that water may be pumped out of the stone if necessary.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/9/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/10/99	**INSPECTION NO.:** MIC-014	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Superintendent	
Velotta Paving: Superintendent, 2 Laborers, Operator	
Thomas Fence: Foreman, Laborer	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Velotta paving came on site and installed ODOT 304 stone over fabric placed by GLC. The stone was compacted after placement was completed. The soft area of subgrade discussed in the 6/9/99 daily report was removed an additional foot and filled with one-inch stone. The stone extended beyond the road to the west so that it may be daylighted to drain in the future if necessary. The stone also extended beyond the road to the east, where a small sump will be installed so that water may be pumped out of the stone if necessary.

Thomas Fence was on site and completed the gate and fence at the SE haul road entrance.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 6/10/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/11/99	**INSPECTION NO.:** MIC-015	**WEATHER:** Cloudy, Light Rain AM, 85°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Superintendent	
Solar Testing - Technician	
Velotta Paving - Operator, 2 Laborers	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Velotta paving was on site and installed ODOT 304 stone over fabric placed by GLC at the NW haul road entrance. The stone was compacted after placement was completed.

Solar testing was on site and performed compaction testing of the ODOT 304 stone at the NW haul road. Tests yielded acceptable compaction results.

Railroad flangeways arrived on site.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/11/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/14/99	**INSPECTION NO.:** MIC-016	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC: Health and Safety Officer, Low-Boy Driver	

MAJOR EQUIPMENT ON-SITE		
Komatsu PC220LC Excavator	#R98	
Komatsu D65EX Dozer	#D601R	
CAT 938G Loader	#L422R	
Ingersoll Rand Smooth Drum Compactor	#EC239R	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

GLC demobilized all the excavator, dozer and compactor from site.

GLC installed railroad flangeways on one crossing at the SE haul road.

Visitors on-site: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/14/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/15/99	INSPECTION NO.: MIC- 16 A	WEATHER: sunny 50-60° F
SITE: Millennium $TiCl_4$ Plant Remedial Action Ashtabula, Ohio		CONTRACTOR: Great Lakes Const. (GLC)

MANPOWER	
GLC → Bill Hocevar	
Thomas Fence → 2 laborers	
Velotta Paving → 1 operator	

MAJOR EQUIPMENT ON-SITE	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- GLC install rail @ RR crossings for SE Haul Rd.
- Thomas Fence on-site to adjust SE haul road gate
- Velotta Paving applied oil to stone in prep. for paving tomorrow

SIGNED: (CQA INSPECTOR) Allan B Billinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/16/99	INSPECTION NO.: MIC - 16 B	WEATHER: Sunny 50-70°
SITE: Millennium $TiCl_4$ Plant Remedial Action, Ashtabula, Ohio		CONTRACTOR: Great Lakes Const. (GLC)

MANPOWER	
· GLC · Bill Hocevar	
· Velotta Paving 1 supervisor, 1 operator	
5 laborers	

MAJOR EQUIPMENT ON-SITE	
· Blaw-Knox paver, PF-4410	
· 2 rollers (Bomag, Hytec)	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Velotta Paving on-site to pave NW & SE haul roads
- - finished paving NW haul Rd.
  - completed laying base course of SE haul rd. by 1530 hrs.
  - plan on finishing wearing course after 1530 hrs.

SIGNED: (CQA INSPECTOR) William B Bruehinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/17/99	**INSPECTION NO.:** MIC-017	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
No personnel on site.	

MAJOR EQUIPMENT ON-SITE	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

GLC is currently demobilized. No work was performed on site. Daily reports will be discontinued until GLC remobilizes.

SIGNED: (CQA INSPECTOR) [signature] 6/17/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/23/99	**INSPECTION NO.:** MIC-018	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, Laborer	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

GLC remobilized. GLC's work force began setting up exclusion zone fencing for the Therminol Tank Area. Fencing was not yet completed by shift's end.

Visitor's: Josef Shehabi - MIC, Rick Hughes - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/23/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/24/99	**INSPECTION NO.:** MIC-019	**WEATHER:** Clear, Humid, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Supervisor,	
Health and Safety Officer, 2-Operators, 3-Laborers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
2 - 10 Wheel End Dumps	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

GLC demolished the above grade portion of the concrete wall surrounding Therminol Tank Area using the hoe-ram attachment to the excavator. Area was considered non contaminated still because the wall was built in the 1980's and MIC stopped using PCB containing therminol oil in 1972. The demolished wall was loaded into the 10-wheel end dumps and hauled to the MIC Landfill where it was disposed. Work continued on the exclusion zone fencing and the personnel decontamination area which were both near completion at shift's end.

Visitor's: Josef Shehabi - MIC, Rick Hughes - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible signature] 6/24/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/25/99	**INSPECTION NO.:** MIC-020	**WEATHER:** Cloudy, Rain - AM; Clear, Humid, 90°F - PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_2$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL

GLC - Superintendent, Health and Safety Supervisor,	
Health and Safety Officer, 2-Operators, 3-Laborers	
Chemical Waste Management - 3 Drivers	

MAJOR EQUIPMENT ON-SITE

Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

The exclusion zone (EZ) fencing and decontamination area were completed and the Therminol area was officially established as an EZ. Bill Hocevar, GLC's H&S Officer, gave all personnel a briefing of the proper procedures to don and doff PPE when entering or exiting the exclusion zone. At this time, all work within the EZ will be performed in level C PPE.

GLC began to demolish the concrete surface in the heater area. Demolition continued until about 9:30 AM when rain suspended work activities for approximately one-hour. When demolition resumed, an area was discovered below grade that began to leak oil into the excavation. The work crew backed out temporarily until the situation was evaluated. It appeared as though less than five gallons of oil infiltrated the excavation. The crew withdrew from this area until the oil and water can be collected. Work progressed to the west side of the Therminol area where excavation proceeded down approximately 2'. Excavated material was loaded into dump trailer trucks supplied by Chemical Waste Management (CWM) in Model City, NY, the destination of the material for disposal. A total of three trucks were sent to CWM. Each truck was inspected for visual contamination, manifested and weighed at the MIC landfill scales prior to shipment.

SIGNED: (CQA INSPECTOR) [illegible] 6/05/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-020	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

Continued demolition of concrete wall foundation below grade. At shifts end all open excavation areas were covered with plastic which was anchored by sandbags.

Visitor's: Terese Van Donsel - USEPA, Josef Shehabi - MIC, Rick Hughes - MIC, Don Rooney - MIC, Mike Lavery - MIC

SIGNED: (CQA INSPECTOR) [signature] 6/25/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/28/99	**INSPECTION NO.:** MIC-021	**WEATHER:** Cloudy, Warm - AM, Clear, Humid, 90°F - PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
3-Laborers	
Chemical Waste Management - 6 Drivers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Excavation and demolition continued in the Therminol area. All work within the EZ was performed by GLC personnel in Level C PPE. Approximately 2 inches of rain fell on the site over the weekend. The plastic cover over the excavation held ponded water on it, which was pumped into the storm drain by GLC at the beginning of the shift. Ponded water from the Heater Area had a layer of oil on it and was pumped into GLC's water truck for temporary storage. Final disposal of this water is to be based on the results of laboratory analysis.

Excavated material was loaded into dump trailer trucks supplied by Chemical Waste Management (CWM) in Model City, NY, the destination of the material for disposal. A total of six trucks were sent to CWM. Each truck was inspected for visual contamination, manifested and weighed at the MIC landfill scales prior to shipment. At shift's end, all open excavation areas were covered with plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature]

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/29/99	**INSPECTION NO.:** MIC-022	**WEATHER:** Cloudy, 60's, lt rain - AM, Cloudy, 70°F - PM
SITE: Millennium Inorganic Chemicals, Plant 2, TiCl4 Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
3-Laborers	
Chemical Waste Management - 6 Drivers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Excavation and demolition continued in the Therminol area. All work within the EZ was performed by GLC personnel in Level C PPE. Rain fell on the site overnight. The plastic cover over the excavation held ponded water on it, which was pumped into the storm drain by GLC at the beginning of the shift. The west end of the Therminol Area was excavated to its target depth of 2'. The depth was confirmed by the surveyors and a soil sample collected from the bottom of the excavated area. MK performed a PCB field test on the soil sample that confirmed that the PCB concentration in the sample was less than 50 ppm. Demolition and excavation continued in the heater area, which was excavated to its target depth of 10'. Confirmatory soil samples were collected from the bottom of the excavation, and from the west wall of the excavation at a depth of 9'. PCB Field Test results of these samples indicated that they contained PCB concentrations in excess of 50 ppm. The heater area excavation was then deepened to 15', and confirmatory samples were collected from the bottom of the excavation at a depth of 15', and from the wet wall at a depth 13'. PCB Field Test results indicated that these samples had PCB concentrations less than 50 ppm. The heater area was backfilled approximately 100 yards of a concrete backfill mix. NOTE: The heater area beneath the pipe rack was not excavated due to space

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-022	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

limitations associated with the size of the excavator. Black oil was observed to be leaking into the heater area excavation from beneath a concrete slab (depth ~1 ft) exposed at the south end of the excavation, beneath the overhead pipe rack. Excavated material was loaded into dump trailer trucks supplied by Chemical Waste Management (CWM) in Model City, NY, the destination of the material for disposal. A total of six trucks were sent to CWM. Each truck was inspected for visual contamination, manifested and weighed at the MIC landfill scales prior to shipment. At shift's end, all open excavation areas were covered with plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) Al Brillinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 6/30/99	INSPECTION NO.: MIC - 023	WEATHER: P.Cloudy, AM 60°, Clear, PM 75°F
SITE: Millennium Inorganic Chemicals, Plant 2 TCLP Facility		CONTRACTOR: Great Lakes Construction (GLC)

MANPOWER	
GLC - Superintendent, H&S Officer	
3 - Laborers	
CWM - 6 drivers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC 220 LC Excavator w/ Rock Bucket	
Cat 950B Loader	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Excavation continued in the Thermal Tank area. Excavated material was loaded into dump trailers and hauled to Chemical Waste Management (CWM) in Model City, NY where it was disposed. A total of 6 trucks were loaded, inspected for exterior contamination, manifested and shipped.

To simplify excavation areas in the Thermal Tank Area the area has been broken down into sections TTA-1 through TTA-6 based on excavation depths. The attached map of the Thermal Area illustrates the breakdown of the area. In future reports these areas will be referred to

SIGNED: (CQA INSPECTOR) [signature] 6/30/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-023 6/30/99	PAGE 2 OF 3

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

With sample results indicating that TTA-1 was "clean", GLC moved the EZ fence to no longer include it in the EZ. The area was backfilled with ODOT 304 stone up to the pavement grade to provide temporary vehicle access if necessary.

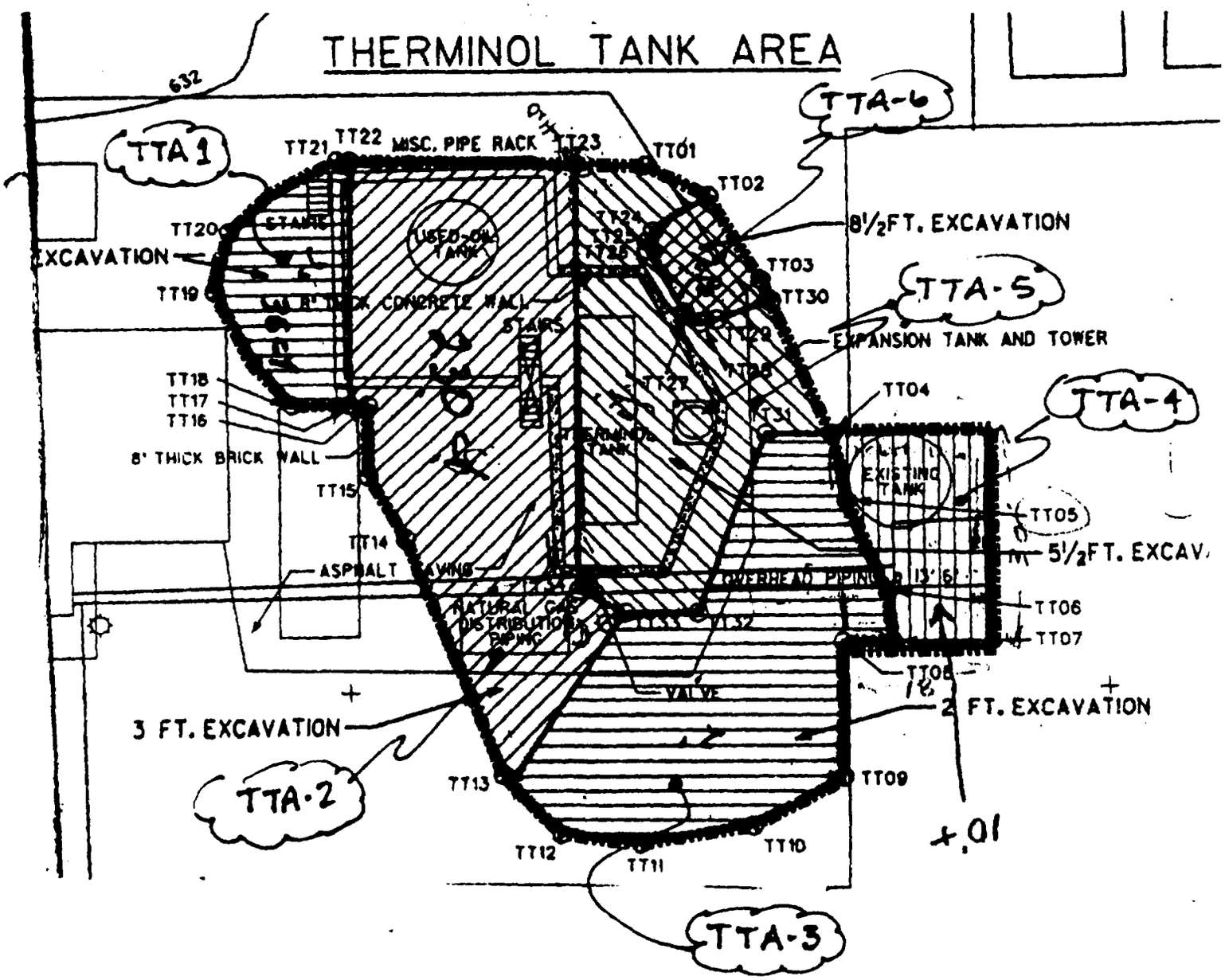
A conference call was made between Josef Shehabi, Rick Hughes, Don Rooney, Jeff Kyser and Terese Van Dousel. The call was intend to give Terese a report of the weekly progress to date. Terese expressed that she would like to be notified of the air monitoring sample results at the Thermal Area, water sample results from the water collected in TTA-4 (heater area) and soil sample results from the soil borrow material at the MIC Landfill

Attended weekly progress meeting held between MK, MIC, GLC and ALM. Minutes from the meeting were taken by MIC

Visitors: ~~Jose~~ JK 6/30 Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 6/30/99

6/30/99
MIC-023
Page 3 of 3
JR 6/30/99



TTA= Therminol Tank Area

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/1/99	**INSPECTION NO.:** MIC-024	**WEATHER:** Cloudy, 60's - AM; Cloudy, Humid, 75°F - PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
2-Laborers	
Chemical Waste Management - 7 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
Water Truck (4000 Gal) SR 7/1	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Excavation and demolition continued in the Therminol area. All work within the EZ was performed by GLC personnel in Level C PPE. Excavated material was loaded into dump trailer trucks supplied by Chemical Waste Management (CWM) in Model City, NY, the destination of the material for disposal. A total of seven trucks were sent to CWM. Each truck was inspected for visual contamination, manifested and weighed at the MIC landfill scales prior to shipment. Excavation reached grade in the northwest portion of TTA-2 which was verified by survey. A sample was collected and field screened for PCB concentrations. Sample results indicated the material contained < 50 mg/kg PCBs. The EZ fence was moved and this portion of TTA-2 was then backfilled with 304 stone.

Contaminated water that has been collected in the in the water truck was sampled both from the top of the water, where an oily film was identified and in the center of the water. Results are expected by 7/6.

SIGNED: (CQA INSPECTOR) [signature] 7/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-024	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 9/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/2/99	**INSPECTION NO.:** MIC-025	**WEATHER:** Clear, Humid, Low 80s °F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
2-Laborers	
Chemical Waste Management - 10 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
4000 Gal Water Truck JK 1/2	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in Level C PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of ten trucks were loaded, inspected, manifested and shipped.

Excavation reached the required grades in the central portion of TTA-2. Sharp's Surveying verified that design elevations were met and the EZ fence was moved to allow access to completed excavation areas. These completed areas were backfilled with ODOT 304 stone to develop a new loading area for trucks. The stone placed was not placed in lifts or compaction tested due to time constraints to install the ramp. GLC is cognizant of the fact that the stone will require proper lift placement and compaction before it can be accepted as properly completed.

At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] Ryan 7/2/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/6/99	**INSPECTION NO.:** MIC-026	**WEATHER:** Clear, Humid. Low 90s °F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
2-Laborers	
Chemical Waste Management - 6 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
4000 Gal Water Truck SR 7/6	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in Level C PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of six trucks were loaded, inspected, manifested and shipped. The loading area was moved from the NW portion of the Therminol Area to the NE portion of the Therminol Area.
- The personnel decontamination area was also moved from the SW to the SE side of the Therminol Area.
- Excavation proceeded into TTA-5 and TTA-6. Both a sewer line and a water supply line were encountered at approximately 5' below grade. Excavation in the north portion of TTA-5 reached grade and was verified by Sharp's Surveying. After survey verified that the excavation was at grade, samples were collected at both the excavation bottom and the north sidewall within TTA-5. One of the design points within TTA-5, point T-23, fell on top of the sewer line which made it impossible to obtain a ground surface shot to verify elevation at that point. The ground surface immediately adjacent to the sewer line was verified to be at required depth and that point will serve as design point T-23 on the excavation as-built drawing.
- Each field sample result indicated that soil at the excavation limits contained < 50 mg/kg PCBs and the excavation was filled with

SIGNED: (CQA INSPECTOR) [signature] 7/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-026	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

ODOT 304 stone adjacent to the exposed sewer and water lines.

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/7/99	**INSPECTION NO.:** MIC-027	**WEATHER:** Clear, Low 80s °F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
3-Laborers	
Chemical Waste Management - 6 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
4000 Gal Water Tank	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ have downgraded to modified Level D PPE based on air sample results indicating particulate levels lower than OSHA and ACGIH requirements, a decision by GLC's management, and MIC's approval. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of six trucks were loaded, inspected, manifested and shipped.

- Excavation resumed in the southern half of TTA-4, the heater area, where excavation proceeded down to a depth of 15'. Sharp's surveying verified that the excavation had reached 15' and the excavation was backfilled with LSM 50, a flowable fill containing cement. The mix design for the LSM 50 is attached.

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) Jeffrey Rogers 7/7/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/8/99	**INSPECTION NO.:** MIC-028	**WEATHER:** Clear, Low 80s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
3-Laborers	
Chemical Waste Management - 6 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
4000 Gal Water Truck JR 7/8	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of ten trucks were loaded, inspected, manifested and shipped.

- Excavation continued in both TTA-5 and TTA-6. A brownish, oily substance was observed on the north wall of TTA-6. The substance was checked with both a PID and CGI by GLC health and safety officer, Bill Hocevar. Neither instrument recorded any readings from the material. Upon closer investigation, the material was not oily but more of a solid material. A sample of the material was collected and analyzed for PCBs using an immunoassay field test kit. Test results indicated that the material contained < 50 mg/kg PCBs. Excavation in TTA-6 reached the required grade of 8.5' and the excavation bottom depth was verified by Sharp's Surveying and sampled for PCB field analysis. Sample results indicated the soil contained < 50 mg/kg PCBs. Sample locations were surveyed and sample results were recorded in the Field Sampling Log Book.

- As the water supply line in TTA-6 was exposed, it was temporarily supported until backfill was allowed to occur. The excavation

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-028	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

was backfilled with LSM 50 flowable fill up to the top of the water supply pipe.

- GLC removed the contaminated soil beneath the gas lines in TTA-2 by means of hand excavation.

- With the water truck approximately 3/4 full, the water was taken to the concrete pad adjacent to the MRP. Contaminated water from the truck was dispersed onto the pile from outside the fencing surrounding the pile.

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/9/99	**INSPECTION NO.:** MIC-029	**WEATHER:** Overcast, 70s A.M., Humid, 85 P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
1-Laborer	
Chemical Waste Management - 12 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of twelve trucks were loaded, inspected, manifested and shipped. Excavation was performed in TTA-5.
- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.
- Cat 330B excavator arrived on site.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/9/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/12/99	**INSPECTION NO.:** MIC-030	**WEATHER:** Clear, Low 80s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
1-Laborer	
Chemical Waste Management - 5 Drivers	
Sharp's Surveying - Instrument Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of eleven trucks were loaded, inspected, manifested and shipped.

- Excavation proceeded immediately to the west of the heater area where it was necessary to chase out contaminants identified in the west wall of TTA-4 (heater area) at 9.5' depth on 6/29/99. Excavation proceeded to a depth of 10' at which time samples were collected at bottom and the south and west sidewalls of the excavation. The extent of the excavation was surveyed by Sharp's Surveying. Sample results indicated that the soil contained < 50 mg/kg PCBs and the area was backfilled with LSM 50 (flowable fill) up to approximately 5' below final grade. Excavation then proceeded into TTA-3 until the shift's end.

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/12/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/13/99	**INSPECTION NO.:** MIC-031	**WEATHER:** Clear, Low 80s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 2-Operators,	
1-Laborer	
Chemical Waste Management - 5 Drivers	
Sharp's Surveying - Instrument Man	
Dart Trucking - 1 Driver	
Solar Testing - 1 Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	
Cat 950B Loader	
ord 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of five trucks were loaded, inspected, manifested and shipped.

- Excavation continued in both TTA-3 and TTA-2. The exclusion zone(EZ) was reconfigured by running the northern fence parallel to the overhead piping, about 5 ft north of the overhead piping. Thus, TTA-2, 3, and 4 south of this fence line were within the EZ, and the remaining areas were outside the EZ.

- Backfilled areas outside of EZ (TTA-2 and 5) using soil stockpiled from the haul road excavations (brown sandy silt, with gravel and trace cobbles). Approximately 160 yards of material backfilled. Material was spread with Cat loader, and rolled with Dynapac vibratory roller. Two lifts were placed; Solar Testing performed moisture and density testing using Troxler nuclear density gage. The compaction was deemed acceptable at 101% and 97 % compaction of optimum density for each of the lifts.

- Three composite samples were collected from the backfill material delivered to the site for possible future testing.

SIGNED: (CQA INSPECTOR) Allan B. Brillinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-031	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) Allan B. Brillinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/14/99	**INSPECTION NO.:** MIC-032	**WEATHER:** Clear, Low 80s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
6-Laborers	
Chemical Waste Management - 2 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	
Dart Trucking - 1 Driver	
Solar Testing - 1 Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of two trucks were loaded, inspected, manifested and shipped.

- Excavation continued in TTA-3. It appeared to be near completion when a dark area beneath the gas lines was encountered at the base of the excavation. GLC was required to excavate an additional six inches to investigate the area. Upon doing so, 5 utility lines were encountered that were surrounded by dark, oily appearing soil. A field sample of the dark soil was collected and analyzed. Results indicated that the soil contained > 50 mg/kg PCBs. The utility lines had been previously abandoned and were cut and removed from the excavation. Excavation then proceeded down to a depth of approximately 4', approximately 1' beneath where the dark soil ran out. Lateral excavation was not yet completed by shift's end.

- Backfill in the northern half of TTA-2, 3, 5 and 6 continued. Backfill soil was placed in 12" lifts and compacted to a minimum of 95% standard proctor. A technician from Solar Testing was on site and performed compaction tests.

SIGNED: (CQA INSPECTOR) [illegible] 7/14/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-032	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- At shift's end, all contaminated areas were covered with plastic and the plastic anchored by sandbags.
- Attended weekly progress meeting.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 7/14/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/15/99	**INSPECTION NO.:** MIC-033	**WEATHER:** Clear, Low 90s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
4-Laborers	
Chemical Waste Management - 3 Drivers	
Sharp's Surveying - Instrument Man, Rod Man	
Dart Trucking - 1 Driver	
Solar Testing - 1 Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator w/Hoe Ram #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Excavation continued in the Therminol Tank Area. All personnel in the EZ remain in modified Level D PPE. Material was excavated, loaded into dump trailers and shipped to CWM in Model City, NY. A total of three trucks were loaded, inspected, manifested and shipped.

- Excavation continued in TTA-3. It appeared to be near completion when a dark area beneath the gas lines was encountered at the base of the excavation. GLC was required to excavate an additional six inches to investigate the area. Upon doing so, 5 utility lines were encountered that were surrounded by dark, oily appearing soil. A field sample of the dark soil was collected and analyzed. Results indicated that the soil contained > 50 mg/kg PCBs. The utility lines had been previously abandoned and were cut and removed from the excavation. Excavation then proceeded down to a depth of approximately 4', approximately 1' beneath where the dark soil ran out. Lateral excavation was not yet completed by shift's end.

- Backfill in the northern half of TTA-2, 3, 5 and 6 continued. Backfill soil was placed in 12" lifts and compacted to a minimum of 95% standard proctor. A technician from Solar Testing was on site and performed compaction tests. All tests were determined to be

SIGNED: (CQA INSPECTOR) 7/15

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-033	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

satisfactory.

- GLC set up an equipment decontamination facility for decontaminating the 220 excavator. The excavator was decontaminated and

visually inspected prior to allowing it to leave the EZ.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/15/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/16/99	**INSPECTION NO.:** MIC-034	**WEATHER:** Clear, Humid, Low 90s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
4-Laborers	
Dart Trucking - 1 Driver	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

TTA - All excavation activities in the Therminol Tank Area are complete. The area was backfilled with borrow soil from Millennium's process landfill. It was noted that organic material and debris in the soil appears to be increasing. GLC was informed that if borrow material needed to improve or future loads would be rejected. When completed ODOT 304 stone was placed over the soil and compacted.

PPA - Mobilized remediation of Area C in the Plant Process Area. GLC set up exclusion zone fencing and personnel decontamination facilities. Excavation of the area began on its north side. An abandoned footer wall was discovered below the surface at the north side of the excavation. If further excavation reveals that the footer wall extends below the 4' excavation limit, excavation will be allowed to cease at the footer wall and not be required to go to the design limits.

- Removed concrete pipe trench running through the north half of Area C. The section of pipe to be removed was temporarily bypassed while work proceeded.

SIGNED: (CQA INSPECTOR) 7/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-034	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Area C was covered with plastic at shifts end.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

TTA - Therminol Tank Area

PPA - Plant Process Area

SIGNED: (CQA INSPECTOR) [signature] 7/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/19/99	**INSPECTION NO.:** MIC-035	**WEATHER:** Overcast, Low 70s - A.M.; Clear, Low 80s - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
4-Laborers	
Dart Trucking - 1 Driver	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

TTA - It was discovered that GLC did not install filter fabric beneath the 304 stone placed in the Therminol Area. Gene Marks was was informed of this deficiency and directed his forces to remove the stone and install the filter fabric. The stone was removed, the the filter fabric properly placed, and the stone was replaced. As a result of the correction, it was not necessary to issue a Problem Identification Report.

PPA - Excavation continued in Area C. Trucks were loaded, manifested, inspected and shipped to Millennium's landfill.

Excavation in Area C is approximately 50% complete.

- Area C was covered with plastic at shifts end.

MRP - Began installtion of exclusion zone fencing. This activity is proceeding in modified Level D PPE.

- Larry Jensen of USEPA and Chuck McCracken of ODH were on site today. During their visit they were given demonstrations of

SIGNED: (CQA INSPECTOR) 7/19/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-035	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

some of the radiological procedures that radiological technicians will be performing during the course of the work.

Visitor's: Larry Jensen - USEPA, Chuck McCracken - ODH, James East MK, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

TTA - Therminol Tank Area

PPA - Plant Process Area

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 7/19/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/20/99	**INSPECTION NO.:** MIC-036	**WEATHER:** Overcast, Low 70s - A.M.; Clear, Low 80s - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 3-Operators,	
4-Laborers	
Dart Trucking - 1 Driver	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

PPA - Excavation continued in Area C. Trucks were loaded, manifested, inspected and shipped to Millennium's landfill. Further excavation at the north retaining wall revealed that the wall extends below the 4' depth of required excavation in Area C. As a result, excavation will be allowed to cease at the wall and will not be required to reach the design points north of the wall. All other design points were reached within the excavation as well as the required 4' depth. Sharp's Surveying verified that all design points were met and a sample was collected from the excavation bottom to be field screened for PCBs. Analytical results indicated that Area C contained < 50 mg/kg PCBs and Area C was approved to receive backfill.

MRP - Continued installtion of exclusion zone fencing. This activity is proceeding in modified Level D PPE.

Visitor's: Larry Jensen - USEPA, Chuck McCracken - ODH, James East MK, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC, Mike Lavery - MIC

SIGNED: (CQA INSPECTOR) 7/20/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-036	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

PPA - Plant Process Area

MRP - Mining Residuals Pile

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/21/99	**INSPECTION NO.:** MIC-037	**WEATHER:** Overcast, Low 70s - A.M.; P. Cloudy, Humid, 85 - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 4-Operators,	
6-Laborers	
Dart Trucking - 1 Driver	
Sharp's Surveying - Instrument Man, Rod Man	
MK- 3 HP Personnel, Self	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

PPA - Installed filter fabric over subgrade in Area C. 304 stone was placed over backfill in one foot lifts and compacted. Backfill ceased on the north half of Area C when grade was reached wher e the concrete pipe trench is to be replaced.

MRP - Continued installtion of exclusion zone fencing. This activity is proceeding in modified Level D PPE. The 220 PC excavator was placed on the MRP to track over weeds and growth on the pile. No intrusive work was performed. Received approval from USEPA to begin excavation of the MRP on Monday, July 26.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

PPA - Plant Process Area

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 7/21/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/22/99	**INSPECTION NO.:** MIC-038	**WEATHER:** Overcast - A.M.; Clear, Humid 90 - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 4-Operators,	
6-Laborers	
Sharp's Surveying - Instrument Man, Rod Man	
MK - 3 HP Personnel, Self	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

PPA - Constructed forms for concrete pipe trench and concrete step foundation that were removed during excavation of Area C. Rebar was installed in the same configuration as what was removed. Concrete arrived at 1:00 P.M. and was installed for both the pipe trench and step foundation.

MRP - Began installation of silt fencing on the south side of the MRP. The silt fence is being installed in clean soil, therefore this activity is proceeding in modified Level D PPE. An 8" x 8" trench was excavated and posts, 6" x 6" mesh, and fabric were installed. No stone backfill has been installed as of this point.

- Began clearing of vegetation. All clearing activities are non-intrusive into the soil.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC,

SIGNED: (CQA INSPECTOR) [signature] 7/22/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/23/99	**INSPECTION NO.:** MIC-039	**WEATHER:** Overcast - A.M.: Clear, Humid 90 - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 4-Operators,	
6-Laborers	
Sharp's Surveying - Instrument Man, Rod Man	
MK - 3 HP Personnel, Self	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

PPA - Completed backfill of 304 stone adjacent to the newly poured pipe trench and step foundation. Only paving remains to be completed in Area C.

MRP - Continued installation of silt fencing on the south side of the MRP. Silt fence operations proceeded to the east side of the MRP where trenching is being performed in contaminated soil. As a result, this activity is proceeding in Level C PPE. All silt fencing was installed as per design drawings.

- Continued clearing of vegetation. All clearing activities are non-intrusive into the soil.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC,

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/24/99	**INSPECTION NO.:** MIC-040	**WEATHER:** Overcast, Light Rain - A.M.; Clear, Humid 90 - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer, 4-Operators,	
6-Laborers	
MK - 3 HP Personnel, Self	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued installation of silt fencing on the east side of the MRP. This activity is proceeding in Level C PPE. All silt fencing was installed as per design drawings.

- Continued clearing of vegetation. All clearing activities are non-intrusive into the soil.

Visitor's: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/24/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/26/99	**INSPECTION NO.:** MIC-041	**WEATHER:** Clear, 85 - 90
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
3-Operators, 9-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying	
MIC - Manifestor	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued installation of silt fencing on the north side of the MRP. This activity is proceeding in Level C PPE. All silt fencing was installed as per design drawings.

- Excavation of the MRP began in Grid 1 located at the SE corner of the MRP. Only a small portion of Grid 1 was excavated to into Grid 2 where excavation proceeded through the entire grid. Depths at the grid points were verified by Sharp's Surveying which were found to at or below required grade. Once surveyed, Grid 2 and the completed portion of Grid 1 were radiologically surveyed by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in both the east and west halves of Grid 2. An "x" was placed in each grid half and five samples were collected from each grid half at approximated points on the "x" as indicated by the RA Work Plan. The five samples were composited and transported to RMI for initial Radium counts. Results indicated that Radium levels in each composite sample were well below the cleanup goal of 12 pCi/g and the grid was permitted to receive backfill by CQA. Filter fabric was placed over the soil subgrade and Grid 2 was backfilled with No. 1 stone up to the haul road subgrade. ODOT 304 stone was placed over

SIGNED: (CQA INSPECTOR) SK 7/26/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-041	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

MRP (cont'd) - the No. 1 stone to a depth of 1' and compacted. The stoned area was prepared to be a temporary loading area for trucks hauling MRP material. Note that Grid 1 was surveyed for radiation, but has not yet been sampled. This is because a significant portion of Grid 1 remains to be excavated.

- Normally the specifications require that no stockpiling is allowed during off work hours. Just for today, GLC was permitted by CQA to stockpile soil because they had no feasible place to load trucks. Any truck parked adjacent to the MRP would block the railroad tracks, which would create a safety hazard. The stockpile was covered with plastic and secured at shift's end.

TTA - Sawcut existing pavement around the perimeter of the backfilled excavation to prepare for repaving of the area.

Supplemental - The site was visited by the USACE. Sook Reid, Marty Connolly, and Fred Tshcop of the Cleveland office and Hans Honerlah of the Baltimore office were on site. All received a tour of the MRP, the landfill and the Plant Process Area. Fred Tschop is scheduled to be the permanent on-site representative for the duration of the job. Hans Honerlah will remain on site until Wednesday, July 28 and perform a review of health physics procedures on site.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC, Mike Lavery - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/26/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/27/99	**INSPECTION NO.:** MIC-042	**WEATHER:** Clear, 85 - 90
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
3-Operators, 9-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying	
MIC - Manifestor	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued installation of silt fencing on the north side of the MRP. This activity is proceeding in Level C PPE. All silt fencing was installed as per design drawings.

- Excavated the stockpile that was placed on 7/26 (see daily report MIC-041 which explains why no stockpiling requirement was temporarily waived). Began shipment of MRP material to the MIC Landfill. A total of 18 trucks were loaded, inspected, manifested and shipped to the MIC Landfill. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive.

Visitor's: Fred Tschop - USACE, Hans Honerlah - USACE, Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/27/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/28/99	**INSPECTION NO.:** MIC-043	**WEATHER:** Clear, 90
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
3-Operators, 9-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying	
MIC - Manifestor	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Vermeer Trencher	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Completed installation of silt fencing on the north side of the MRP. The trencher was wipe sampled for PCBs and frisked for radiological contamination. It will be released from site when results indicate that it is not contaminated.

- Rain fell on the site last night, but left minimal amounts of residual water behind. The water was pumped and dispersed over unexcavated portions of the MRP. Excavation then continued into Grids 5 and 6 which were nearly half complete at shifts end.

A total of 46 trucks were loaded, inspected, manifested and shipped to the MIC Landfill. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive.

- Attended weekly progress meeting.

Visitor's: Fred Tschop - USACE, Hans Honerlah - USACE, Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/28/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/29/99	**INSPECTION NO.:** MIC-044	**WEATHER:** P. Cloudy, 85
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying	
MIC - Manifestor	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation proceeded in grids 5, 6, 7 and 8. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive. A total of 40 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- Excavation reached required limits in the south half of Grid 5, the north half of Grid 6, and all of Grid 7. Sharp's surveying verified excavation depths at the grid points. The grids were surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g.

- A sample was collected in Grid 7 and field analyzed for PCBs. Test results indicated that the soil contained less than 3.1 mg/kg.

Visitor's: Larry Jensen - USEPA, Chuck McCracken - ODH, Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 7/29/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 7/30/99	**INSPECTION NO.:** MIC-045	**WEATHER:** Sunny. 80-90
SITE: Millennium Inorganic Chemicals. Plant 2. $TiCl_4$ Facility. Ashtabula. OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent. Foreman. Health and Safety Officer.	USACE - Inspector
3-Operators. 7-Laborers	
MK - 3 HP Personnel. Inspector	
Sharp's Surveying	
MIC - Manifestor	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation proceeded in grids 6 and 8. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive. A total of 46 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- Excavation reached required limits in Grid 6 (south) and all of Grid 8. Sharp's surveying verified excavation depths at the grid points. The grids were surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g.

Silt Fence - Finished installing perimeter silt fence.

NW Decon/Loading Area - Began construction of NW decon/loading area.

Visitor's: Larry Jensen - USEPA. Chuck McCracken - ODH. Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) Allan B. Brillinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/2/99	**INSPECTION NO.:** MIC-046	**WEATHER:** Scattered Clouds, 70°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - Manifestor (2) JK	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
ord 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation proceeded in grids 25, 26, and 3. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive. A total of 51 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- Began placement of fill material in Grids 5, 6, 7, and 8. Fill was placed in one foot lifts and compacted. This fill material is not permanent, it has only been installed to develop a turnaround area for trucks. For this reason, none of the fill has been compaction tested yet.

North and Non Traffic Areas - Excavation began at the NW end of these areas. A total of 12 trucks were loaded, inspected, manifested and shipped to the MIC Landfill. Excavation proceeded through Grids 132 and 125. Excavation depths were verified at the appropriate grid points by Sharp's Surveying. Although these areas are considered to be free of radiological contamination, ch of the grids was surveyed with a "Fidler" to ensure that no radiological levels above background were encountered. The Fidler

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-046	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

survey confirmed such.

- Began demolition of concrete structure in Grid 126.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) 8/2/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/3/99	**INSPECTION NO.:** MIC-047	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - Manifestor (2)	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
ord 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation proceeded in grids 5 and 3. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive. A total of 51 trucks were loaded, inspected, manifested and shipped to the MIC Landfill. Limits of excavation were reached in the west half of Grid 3 and the north half of Grid 5. Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g.

- Continued placement of fill material in Grids 6 and 7. Fill was placed in one foot lifts and compacted. This fill material is not permanent, it has only been installed to develop a turnaround area for trucks. For this reason, none of the fill has been compaction tested yet.

ssued Problem Identification Report (PIR) -001 for incorrect silt fence installation (see PIR-001, dated 8/3/99)

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-047	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

North and Non Traffic Areas - A total of 18 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

Excavation proceeded through Grids 124 and 126. Grid 126 was completed and excavation depths were verified at the appropriate grid points by Sharp's Surveying. Although this area is considered to be free of radiological contamination, the grid was surveyed with a "Fidler" to ensure that no radiological levels above background were encountered. The Fidler survey confirmed this.

- Began demolition of below grade concrete flume in Grid 116.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 8/3/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/4/99	INSPECTION NO.: MIC-048	WEATHER: Clear A.M., Cloudy, Lt. Rain P.M., 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		CONTRACTOR: Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation proceeded in grids 27 and 26. Trucks hauling material were surveyed to verify that they contained no exterior radiological contamination and did not exceed DOT limits for considering the material radioactive. A total of 54 trucks were loaded, inspected, manifested and shipped to the MIC Landfill. Limits of excavation were reached in the SE half of Grid 27 and the north half of Grid 26 Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g.

- Continued placement of fill material in Grids 5 and 3. Fill was placed in one foot lifts and compacted. This fill material is not permanent, it has only been installed to develop a turnaround area for trucks. For this reason, none of the fill has been compaction tested yet.

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-048	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

North and Non Traffic Areas - A total of 20 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

Excavation proceeded through Grids 124 and 116.

- Began demolition of below grade concrete flume in Grid 116.

John Bresnahan of USACE arrived on site today. He will replace Fred Tschop as USEPA's on site representative effective on Monday, 8/9

Visitor's: John Bresnahan - USACE, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) [signature] 8/4/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/5/99	**INSPECTION NO.:** MIC-049	**WEATHER:** Rain, 65°F A.M., P. Cloudy P.M., 75°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - 2 Inspectors
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Rain shut down all material hauling activities from the MRP. Most craft were sent home at 9:00 A.M. One truck was loaded, inspected, manifested and shipped to the MIC Landfill prior to heavy rain beginning.

North and Non Traffic Areas -- Began demolition of below grade concrete flume in Grid 116.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 8/5/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/6/99	**INSPECTION NO.:** MIC-050	**WEATHER:** P. Cloudy, Windy, 75°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Although there was significant rainfall yesterday, the site was affected minimally by water other than minor puddling.

Excavation resumed in grids 26 and 9 and excavation was completed in the south half of Grid 26 and the north half of Grid 9.

Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g.

- Fill material placement continued in Grids 26 and 9. Fill was placed in one foot lifts and compacted. This fill material is is permanent in this area and will require compaction testing after placement of approximately 500 cubic yards.

- A total of 71 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Completed demolition of the concrete flume down to required excavation grade. The remaining portions below grade were left in place. The area was temporarily backfilled with the same material that was originally over it and

SIGNED: (CQA INSPECTOR) [illegible] 8/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-050	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

will be removed when excavation within this grid occurs.

- Began continuation of gravel haul road extending out from the paved road at the NW end of the site. Approximately 120' of road was completed. A loading area was set up at the end of the road where loading is planned to resume on 8/9.

- No truck were shipped from this end of the excavation today.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/7/99	**INSPECTION NO.:** MIC-051	**WEATHER:** Clear, Windy, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - Manifestor	
RMI - Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 9, 10, 11 and 12. Excavation was completed in 9 South, 10 North, 11 North and 12 South. Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". Results showed no significant levels above background in the soil, therefore radiological samples were collected in each of the grids. Results indicated that the soil contained less than 12 pCi/g. After sample activities were completed, excavation activities moved to Grid 38.

- Fill material placement continued in Grids 9, 10, 11 and 12. Fill was placed in one foot lifts and compacted. This fill material is is above grade and will not require compaction testing.

- A total of 45 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

Visitor's: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/7/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/9/99	**INSPECTION NO.:** MIC-052	**WEATHER:** Clear, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 38 and 39 and was completed in each of the grids. Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". The survey identified several "hot spots" which were removed until acceptable levels were achieved at which time radiological samples were collected. Results indicated that the soil contained less than 12 pCi/g.

- A total of 62 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities resumed in this area and proceeded into Grids 116, 117 and 118. The west half of Grid 116 was completed and surveyed by Sharp's surveying for grade verification. A radiological survey followed the grade survey. Analytical results indicated that the soil contained less than 12 pCi/g.

- A total of 22 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

SIGNED: (CQA INSPECTOR) 8/9

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-052	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

TTA - Graded ODOT 304 stone to prepare the area for paving.

Visitor's: James East - MK, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 6/4/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/10/99	**INSPECTION NO.:** MIC-053	**WEATHER:** Rain - AM, Cloudy - PM, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 27 and 37 and excavation was completed in the NW half of Grid 27 and the SE half of 37. Sharp's surveying verified excavation depths at the grid points. The grids were then surveyed for radiological material by means of a low energy gamma walkover using a "Fidler". No significant levels were encountered during the survey, therefore radiological samples were collected. Results indicated that the soil contained less than 12 pCi/g.

- A total of 61 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 116, 117 and 118. Excavation was completed in Grids 122 and 123. These grids do not contain radioactive contamination, but were walked over with a Fidler as a precautionary measure. Results indicated that no elevated levels of radioactive material were present.

- A total of 31 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

SIGNED: (CQA INSPECTOR) SK 8/10

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-053	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

USEPA visited the site today to observe operating activities. In a meeting, USEPA required that radon monitoring be performed to ensure personnel on-site are not exposed to elevated levels of radon. MIC agreed to perform the monitoring and will implement the program as soon as they can obtain equipment. No other significant issues were identified that required corrective action.

Visitor's: Larry Jensen - USEPA, Terese Van Donsel - USEPA, Steve Helemer, James East - MK, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/10/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/11/99	**INSPECTION NO.:** MIC-054	**WEATHER:** Rain - AM, Cloudy - PM, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	Solar Testing - Soil Technician
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 28 and 25. No grids were fully completed therefore no surveys or radiological sampling was performed

- A total of 59 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 117 and 118. Excavation was completed in Grid 118 The SE corner of Grid 118 fell on a concrete structure discovered below existing ground surface. Excavation depths were achieved adjacent to the edge of the concrete structure and the limits of the wall were surveyed to show where the structure impeded the excavation. Grids 118 and 122E contain no known radioactive contamination, but were walked over with a Fidler as a precautionary measure. Results indicated that no elevated levels of radioactive material were present.

- A total of 18 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Radiological samples were collected in Grids 115 and 116E.

SIGNED: (CQA INSPECTOR) [illegible] 8/11

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-054	**PAGE** 2 **OF** 4

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

TTA - Solar Testing was on site and performed compaction testing on the ODOT 304 stone subbase for pavement. All tests were found to be acceptable.

PPA - Solar Testing was on site and performed compaction testing on the ODOT 304 stone subbase for pavement. All tests were found to be acceptable.

- USEPA remained on site today to observe operating activities. No significant issues were identified that required corrective action.

- Attended weekly progress meeting.

Visitor's: Larry Jensen - USEPA, Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

TTA - Therminol Tank Area

PPA - Plant Process Area

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 8/11/99

MIC-054 Page 3 of 4

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT

(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millenium Inorganic Chemicals Plant 2 - Ashtabula	FILE NO.:	A990298
OWNER:		REPORT NO.:	
CONTRACTOR:	Great Lakes Construction Co.	DATE:	
SUBCONTRACTOR:			
TECHNICIAN(S):	Janet Schultz		

☒ STANDARD PROCTOR TEST ASTM D-698
☐ MODIFIED PROCTOR TEST ASTM D-1557

REQUIRED PERCENT COMPACTION: 95%

RESULTS ☐ PASS ☐ FAIL REQUIREMENTS

CURVE NO.	METHOD	MAXIMUM DRY DENSITY (LB/FT³)	% OPTIMUM MOISTURE
1	C	137.4	7.3
6	C	120.7	12.1

SOURCE OF REQUIRED COMPACTION:

CONTRACTOR INFORMED OF RESULTS: ☒ YES ☐ NO

COMMENTS: Locations and elevations are approximate per Gene (super) from Great Lakes & No surveyors

IF A PROCTOR IS UTILIZED FROM A DIFFERENT FILE, INCLUDE THE FILE NUMBER.

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE.

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	Therminol Tank Area	632.50 *	130.5 (at 6")	4.50	94.96	1
2	20' from CB	632.50	138.3 "b"	5.06	100.7	1
3	40' from 41-15 Bldng 30' from edge of drive	632.50	129.8 "b"	6.23	94.44	1
4	35' from drive 25' from 41-15 bldng	632.50	133.5 "4"	4.72	97.19	1
5	Area "C" approximate middle	632.50	137.1 "b"	8.84	99.75	1

ADDITIONAL TESTS ON REVERSE

FIELD COPY ONLY

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
6	Area "C" 6' from big steps	632.50	135.8 "b"	9.339	98.83	1
*7	25' N of point 141 MRP	635.00 approx	120.2	11.33	99.61	6
*8	25' N of point 263 MRP	635.00 approx	115.8	11.20	95.92	6
~~9~~	~~25' N of point 250 MRP~~	~~635.00~~				

ADDITIONAL COMMENTS: Many areas of 304 fill very "bony". Note: Area "C" [redacted] - large percentage of standing water 12" lifts compacted to 8"
Surveyor arrived 11:00 - tests 7-end have exact locs & els. Tests 7 & 8 are areas which are overfilled and need to be re-excavated.

FIELD COPY ONLY

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/12/99	**INSPECTION NO.:** MIC-055	**WEATHER:** Clear, Humid, Low 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 12, 25, 28, 41, 54 and 42. Grids that reached required excavation depths were verified at grade by Sharp's Surveying. After the survey, Grids 12N, 25E, 41, 54, 42, SE ½ 25W, and SE ½ 28E were sampled for radiological constituents.

- A total of 48 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- A PCB sample was collected in the center of Grid 25 and will be split for both immunoassay and laboratory analysis. Sample will be analyzed by immunoassay on 8/13.

- Placed backfill in grids 12, 25 and portions of 28 that have been completed and sampled. Fill was placed in one foot lifts and compacted. Fill material is above grade and does not require compaction testing for this reason.

North and Non Traffic Areas - Excavation activities continued in Grids 117, 114 and 112. Excavation was completed in Grids 117 and 114. Upon completion, each grid was surveyed for depth verification and then radiologically sampled. After sampling, the areas

SIGNED: (CQA INSPECTOR) 8/12

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-055	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

were backfilled in 1 foot lifts and compacted. Backfill was stepped into the north bank of the settling pond to avoid creating a potential slip plane when filling against the bank.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC, R. Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 8/12/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/13/99	**INSPECTION NO.:** MIC-056	**WEATHER:** Cloudy, Occasional Rain, High 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 43 and 44. Grid 43 was completed and verified to meet excavation depths by Sharp's Surveying. After the survey, Grid 43 was sampled for radiological constituents.

- A total of 64 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- Performed immunoassay analysis for PCBs on soil sample collected from Grid 25. The remainder of the sample (approximately 8 ounces) was shipped to EA Group (analytical laboratory) in Mentor, OH for a PCB anaylsis.

- Received radiological sample results from Grid 42N. The sample contained 15.7 pCi/g which is greater than the 12 pCi/g cleanup goal. The area was covered with plastic and additional excavation will be performed when excavation equipment returns to this area.

North and Non Traffic Areas - Excavation activities continued in Grids 110 and 112. Excavation was completed in Grids 112. Upon completion, Grid 112 was surveyed for depth verification and then radiologically sampled.

- Received radiological sample results from Grid 114. The sample contained 14.3 pCi/g which is greater than the 12 pCi/g cleanup

SIGNED: (CQA INSPECTOR) 8/13/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-056	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

goal. The excavator returned to the area and removed material until a Fidler walkover survey indicated that levels were near background. Once completed, the area was resampled and backfilled.

- Backfill was placed in Grids 124, 117, 118 and 114. The grids were backfilled in 1 foot lifts and compacted. Backfill was stepped into the north bank of the settling pond to avoid creating a potential slip plane when filling against the bank

- A total of 29 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

Visitor's: Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 8/13/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/16/99	**INSPECTION NO.:** MIC-057	**WEATHER:** Clear, High 60s °F - A.M., High 80s°F - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 36, 37, and 28. Grids 37NW and NW ½ of 28E were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 86 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 110, 111, 109 and 108. Excavation was completed in Grids 110 and 111. Upon completion, Grids 110 and 111 were surveyed for depth verification and then radiologically sampled. Note that all grids north of the settling ponds have required additional excavation due to elevated radiological readings. Additional excavation has ranged from an additional one to seven feet in some areas.

- Elevated radiological readings have been discovered north of the required excavation limits. As a result, it has been determined that the area between the north limits of excavation and the 100 year flood plain will be walked over using a Fidler to identify hot spots within this area. Identified hot spots will be removed and hauled to the MIC Landfill.

SIGNED: (CQA INSPECTOR) 8/16

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-057	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- A total of 26 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

GLC's water truck has been triple rinsed with water and detergent. Per RCRA standards, the truck has been adequately decontaminated. As long as the truck is not used to contain excavation water, water in the truck may be considered not being contaminated.

Visitor's: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Jeffrey Rogers 8/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/17/99	**INSPECTION NO.:** MIC-058	**WEATHER:** P. Cloudy, Low 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 25 and 28. Grids 36 E, SE ½ of 36W, 28W and NE ½ of 25W were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 85 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 105 and 106. Excessive hot spots caused activities to be slowed considerably and no samples were performed in this area today.

- A total of 30 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

Komatsu PC300LC excavator arrived on site.

Visitor's: Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) [signature] 8/17/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/18/99	**INSPECTION NO.:** MIC-059	**WEATHER:** Cloudy, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 35, 45, 52 and 51. Grids 35E and NW ½ of 36W were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 76 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.
- Placed backfill in Grid 14. Fill was placed in 12" lifts and compacted.
- Re-excavated Grid 42N which failed radiological analysis on 8/13. An additional six inches was excavated from the area and the area was resampled. Results indicated that the radium content is well below the 12 pCi/g cleanup goal.

North and Non Traffic Areas - Excavation activities continued in Grids 104, 105, 103 and 102. Excavation was completed in Grids 104 and 105. Upon completion, Grids 104, 105, 106 and 107 were surveyed for depth verification and then radiologically sampled.

- A total of 22 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

SIGNED: (CQA INSPECTOR) JK 8/18

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-059	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

TTA - Placed tack coat over ODOT 304 stone.

Chuck McCracken and Steve Helemer of ODH were on site today to install radon and thoron monitors on site. Monitors were installed in each of the excavators within the exclusion zone.

Visitor's: Chuck McCracken - ODH, Steve Helemer - ODH, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

TTA - Therminol Tank Area

SIGNED: (CQA INSPECTOR) [signature] 8/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/19/99	**INSPECTION NO.:** MIC-060	**WEATHER:** Cloudy, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 13, 14, 51 and 45. Grids 29E, 14W and 13 were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 78 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 100, 101, 103 and 102. Excavation was completed in Grids 102 and 103. Upon completion, Grids 102 and 103 were surveyed for depth verification and then radiologically sampled.

- A total of 5 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

- Backfill placement continued along the north bank of the settling ponds. Material was placed in 12" lifts and compacted. GLC was informed that compaction tests would be required on each lift in this fill. GLC responded by stating that they are prepared to dig holes to reach previous lifts to perform testing on those which have been already covered.

Visitor's: Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/20/99	**INSPECTION NO.:** MIC-061	**WEATHER:** Cloudy, Rain, High 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
'ord 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excessive rain last night created extremely wet conditions and all excavation activities has been postponed until 8/23.

Accumulated water was pumped and dispersed over the MRP.

North and Non Traffic Areas - Solar testing was on site and performed compaction testing on lifts of soil placed north of the settling ponds. Compaction tests indicated that the lifts were not satisfactorily compacted and will require rework when activities resume on 8/23.

- Late on 8/19 it was reported that during backfill activities in Grid 102, some additional hot spots were discovered when equipment was preparing to blend fill material into an existing slope. This area will be removed when excavation resumes on 8/23.

Visitor's: Don Rooney - MIC, Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/20/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/23/99	**INSPECTION NO.:** MIC-062	**WEATHER:** Clear - A.M., Overcast - P.M., Low 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 24, 29, and 35. Grids 24W and 29W were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 67 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Excavation activities continued in Grids 100 and 101. Excavation was completed these grids and were verified to meet excavation depths by Sharp's Surveying. Due to excessive water in the grids, the grids could not be sampled for radiological constituents. Excavation in the North and Non Traffic Areas will be complete once sample results from these grids indicate that no radioactive constituents above cleanup goals are present.

- A total of 5 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.
- Removed hot spot in Grid 102 discovered during backfilling.

SIGNED: (CQA INSPECTOR) 8/23

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-062	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

TTA - Velotta Paving arrived on site and performed paving of Therminol Area. Requested copy of actual pavement mix from GLC. Compaction tests were performed on the pavement by Solar Testing. All results were found to be acceptable.

PPA - Velotta Paving performed paving of Area C. Per Don Rooney, MIC will not require that a tack coat is placed prior to paving in this area.

A large fire occurred at the RMI Sodium Plant on State Road this afternoon. Due to potentially hazardous fumes from the fire, the work force was ordered by MIC to cease work and evacuate the area. This occurred at approximately 3:30 P.M.

Visitor's: Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

TTA - Therminol Tank Area

PPA - Plant Process Area

SIGNED: (CQA INSPECTOR) [illegible] 8/23/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/24/99	**INSPECTION NO.:** MIC-063	**WEATHER:** Clear - A.M., Overcast, Rain - P.M., High 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 35, 45, 15 and 16. Grids 35E, 45E and 29E were completed and verified to meet excavation depths by Sharp's Surveying. After the survey, the grids were sampled for radiological constituents.

- A total of 85 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.

North and Non Traffic Areas - Attempted to sample Grids 100 and 101, however when the Fidler walkover was performed, several hot spots were discovered. Also, a visual inspection was performed and several dark spots were observed along with an oily sheen on top of standing water within the grid. GLC was notified that the area will require additional excavation and they will return to the area at a later time.

Rain shut down all activities at approximately 4:00 P.M.

Visitor's: Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/24/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/25/99	**INSPECTION NO.:** MIC-064	**WEATHER:** Rain, High 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Rain shut down all hauling activities before work began.

- Constructed drum storage area between stockpiles on concrete pad.

- Cut trees on the north portion of MRP.

- Attended weekly progress meeting.

Visitor's: Steve Helemer - ODH, Don Rooney - MIC, Rick Hughes - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/25/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/27/99	**INSPECTION NO.:** MIC-065	**WEATHER:** Cloudy, Clear - Late P.M., Mid 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 2 Manifestors	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

Due to excessive rain, no work was performed on 8/26/99, therefore no report was developed for 8/26/99.

MRP - Conditions on the site were quite wet at shift's beginning. It was noted in Grid 40 that some water has flowed through the silt fence at the limits of excavation here. The area outside the silt fence where water has flowed through was surveyed for radioactive constituents. It will also be field tested for PCBs when the soil dries in the area.

- Excavation continued in Grids 23, 30, and 34. Grids 23E and 30E were excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey. The areas were backfilled in 12" lifts after the Fidler walkover indicated no significant levels above background were present in the grids.

- Excavation continued east and north of the nitrogen pipelines in Grids 1, 3, 4, and 40. Excavation was completed and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

SIGNED: (CQA INSPECTOR) 8/27 8/27/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-065	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- A total of 91 trucks were loaded, inspected, manifested and shipped to the MIC Landfill.
- Inspected the NW end of the MRP in Grids 100 and 101 for suspected areas where water may have flowed through the silt fence.

No areas were observed where such had happened.

Visitor's: Don Rooney - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 8/27/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/28/99	**INSPECTION NO.:** MIC-066	**WEATHER:** Clear, Mid 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 34, 45, and 46. Grids 34E, 53E, 45W and 53W were excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

- Excavation continued in Grids 34, 45, and 46. Grids 34E, 53E, 45W and 53W were excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

- A total of 71 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

North and Non Traffic Areas - Continued construction of gravel road north of the settling ponds. Approximately 350' of road was installled over filter fabric. Approximately 550' of road is now completed.

SIGNED: (CQA INSPECTOR) [illegible] 8/28/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/30/99	**INSPECTION NO.:** MIC-067	**WEATHER:** P. Sunny, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 15, 16, and 23. Grids 15, 16W and 23W were excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

- Excavation also continued in Grids 52 and 51. Grid 52 was excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

- A total of 109 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Dennis Rimer of USACE arrived on site today. Dennis is replacing John Bresnahan as USEPA's representative until John returns.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 8/30/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 8/31/99	**INSPECTION NO.:** MIC-068	**WEATHER:** P. Sunny, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 30, 34, and 46. Grids 30W and 34W were excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey.

- Excavation also continued in Grid 51. The excavation has begun to go significantly deeper in this area on the north end. This means that there is considerably more material to excavate in these grids than others excavated to this point. This has slowed . excavation activities and no grids were completed here. During excavation in Grid 51, some oily soil was discovered surrounding a tree stump being removed. There was only a small amount of oily material (2 excavator buckets), however this is the first oily material found during MRP excavation.

- A total of 109 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Placed backfill on the east and north sides of the nitrogen pipeline. Fill was placed in 12" lifts and compacted.

- D3 bulldozer arrived on site.

Visitors: Rick Hughes - MIC, Don Rooney - MIC, Chuck Sharp - Sharp's Surveying

SIGNED: (CQA INSPECTOR) [illegible] 8/31/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/1/99	**INSPECTION NO.:** MIC-069	**WEATHER:** Clear, Mid 50s°F - A.M., Mid 80s°F - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, **$TiCl_4$ Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 46, 17, 18, and 22. An unknown pipeline was discovered in Grid 46. The pipeline was found to be at the required ground elevation when the grid was surveyed by Sharp's, however the radiological walkover indicated that several hot spots in the grid remained and excavation would have to continue below the pipe. After investigating, the pipe was determined to be a lime supply line no longer used by Millennium. Grid 18E was excavated to grade and verified to design depth by Sharp's Surveying. Radiological samples were collected upon completion of the grade survey in Grid 18E only.

- Excavation also continued in Grid 51. Grid 51E was excavated to grade and verified to design depth by Sharp's Surveying. Upon completion of the survey, radiological samples were collected.

- A total of 110 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- During the course of the shift, GLC was informed several times that trailer liners must run up the tailgates of each trailer bed.

- Dr. Darioush Ghahremani of Radon Survey Systems was on site today to install radon and thoron monitors throughout various areas of the site. The monitors were in the areas agreed upon with USEPA.

SIGNED: (CQA INSPECTOR) [illegible] 9/1

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-069	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Steve Helemer of ODH was on site today. Steve performed a weekly change out of radon and thoron monitors that ODH has on site.
- Attended weekly progress meeting.

Visitors: Sook Reid - USACE, Steve Helemer - ODH, Dr. Darioush Ghahremani - Radon Survey Systems, Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Jeffrey Ryser 9/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/2/99	**INSPECTION NO.:** MIC-070	**WEATHER:** Clear, High 50s°F - A.M., Mid 80s°F - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 22, 31, and 33. Excavation reached required design depths in Grids 22E and 31E and were verified to proper grade by Sharp's Surveying. After the survey was completed, radioactive samples were performed in each grid.

- Excavation also continued in Grids 46, 51 and 57. Grid 46 was radiologically sampled, having already been surveyed for design depths by Sharp's Surveying on 9/1/99.

- A total of 97 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Received approval from USEPA to begin a trial period of shipping contaminated material without using trailer liners. Prior to allowing the liners to be removed, each trailer was inspected by Dennis Rimer and Don Rooney to ensure that the seals on the trailer gates were in acceptable condition. Upon their inspection, it was discovered that several trucks contained either no gasket or an unacceptable gasket that required replacement. As a result of these inspections, PIR-002 was issued. Trucks that were found to have deficient gaskets were removed from service until acceptable gaskets are installed.

SIGNED: (CQA INSPECTOR) 9/2

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-070	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

Visitors: Jeff Daniel - Conestoga Rovers and Associates (CRA), Bob Rule - de maximus, Don Rooney - MIC, Josef Shehabi - MIC

Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/2/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/3/99	**INSPECTION NO.:** MIC-071	**WEATHER:** Clear, Low 60s°F - A.M., Mid 80s°F - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 17, 18, and 33E. Excavation reached required design depths in each of the grids which were verified to proper grade by Sharp's Surveying. After the survey was completed, radioactive samples were collected. A PCB sample was collected in the center of Grid 33E, but had not yet been analyzed by shift's end.

- A total of 36 trucks were loaded, inspected, manifested and shipped to the MIC landfill from the MRP.

- As a follow up to a concern noted in daily report # MIC-065, dated 8/27/99, a sample was collected immediately north of the silt fence at the excavation limits in Grid 40. In report MIC-065, it was noted that surface water flowed directly through the silt fencing thus creating a concern for contamination being spread outside the excavation area. As stated in the report, the area of concern was radiologically surveyed at the time of the occurrence, however collecting a PCB sample was held off until the area was able to dry. The sample collected today was analyzed for PCBs using the immunoassay field test kits. Results indicated that the area of concern contained less than 3.1 mg/kg PCB, therefore the area is no longer a concern in regards to the spread of contaminants.

SIGNED: (CQA INSPECTOR) SK 9/3

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-071	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

North and Non Traffic Area - Excavation returned to Grids 100 and 101 where elevated radiological readings and discolored soil were observed. Soil was removed down to the point where no elevated radiological readings were observed. While excavating in the SW portion of Grid 101, blackish soil was observed in the area. An attempt was made to remove the blackish soil when it was discovered that the dark area was part of soil lens that ran west into Grid 103, an area which had previously been verified clean and backfilled. The soil was observed to possess an organic scent rather than an oily one. A sample was collected from the blackish soil which was field analyzed for PCBs. Results indicated that the soil contained less than 3.1 mg/kg PCBs. The remaining portion of the soil sample was kept and will be sent to an off-site laboratory for analysis. Upon receipt of field analysis results, Grids 100 and 101 were radiologically sampled. Each grid contained extremely soft subgrade therefore, after completion of all sampling, the area was covered with filter fabric and backfilled with #1 stone up to the gravel road subgrade.

- A total of 6 trucks were loaded, inspected, manifested and shipped to the MIC landfill from the North and Non Traffic Area.

- Due to the amount of trucks out of service for gasket repair, GLC only worked an 8-hour shift.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/3/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/7/99	**INSPECTION NO.:** MIC-072	**WEATHER:** Overcast, Low 70s °F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 57, 51, and 50. Excavation appears to have reached required depths in Grids 57E and 51W, but they had not yet been verified to grade by shift's end.

- The sample collected in Grid 33E on 9/3/99 was analyzed for PCBs using the field test kit. Results indicated that the soil contained less than 3.1 mg/kg. The remainder of the sample was kept to be sent to an off-site laboratory for analysis.

- Excavation also continued in grids 22, 31, and 33. Grids 22W and 31W were completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, the two grids were radiologically sampled.

- A total of 105 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/8/99	**INSPECTION NO.:** MIC-073	**WEATHER:** Clear, 80°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 57 and 51. Excavation reached required depths in Grids 57E, 57W, and 51W and were verified to grade by Sharp's Surveying. Radiological samples were then collected in each of the grids. During the walkover survey, the northernmost portion of Grid 57E was discovered to contain elevated radiological material. Due to the steep grades in the remainder of the grid, the remainder of the grid was sampled and allowed to receive backfill. The northern area with elevated rad readings was zoned off with caution tape and will be removed at a later time.

- Excavation also continued in grids 33, 19, 20, and 21. Grids 19 and 20 were completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, grids 33W, 19, 20E and 20W were radiologically sampled. Grid 33W was previously verified to grade by Sharp's Surveying.

- A total of 110 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- A trial procedure was run with no truck liners for 3 trucks. No leakage problems were observed however, significant problems concerning material sticking in the beds were encountered.

SIGNED: (CQA INSPECTOR) 9/8

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-073	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

Visitors: Sook Reid - USACE, Steve Helemer - **ODH, Bill Schildt** - MIC, Mike Lavery - MIC, Josef Shehabi - MIC,

Don Rooney - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 9/8/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/9/99	**INSPECTION NO.:** MIC-074	**WEATHER:** Overcast, Mid 60s°F - A.M., P. Sunny, High 70s - P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 46 and 49. Excavation reached required depths in Grid 46W and was verified to grade by Sharp's Surveying. Radiological samples were then collected in Grid 46W. While excavating in Grid 46W, a suspected drum was encountered. Work crews immediately backed out and donned Level B PPE to investigate. Upon investigation, the item was determined to be a small tank that contained some residual (5-10 gallons) water. IH and rad instruments determined that the tank contained no hazardous or combustible gases and had no elevated rad readings, therefore the tank was loaded into a truck and shipped to the landfill with excavated soil.

- Excavation also continued in grid 21 and onto the concrete pad. Grid 21 was completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, grids 21E and 21W were radiologically sampled.

- A total of 104 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- While loading material in Grid 49, a trailer was noted to have soil leaking from the seal. Upon inspection, it appeared that the truck gate became slightly warped causing a bolt head to hold the gate open. The truck was backed up against the exclusion zone

SIGNED: (CQA INSPECTOR) JK 9/9

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-074	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

and directed to dump its load back into the exclusion zone. The truck was ordered to be removed from service until the gate can be repaired.

- Soil samples from Grids 101 and 33E were turned over to EA group to be laboratory analyzed for PCBs.

- Komatsu D65 Dozer arrived on site and Cat D-6 Dozer was removed from site.

Visitors: Randy Barnes - Ashtabula County Health Dept., Dr. Darioush Ghahremani - Radon Survey Systems, Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/9/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/10/99	**INSPECTION NO.:** MIC-075	**WEATHER:** P. Cloudy, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 50 and 58. Due to the significant depths of excavation, no grids were completed in this area.

- Excavation also continued in Grids 32, 47 and on the concrete pad. Grid 32 was completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, Grid 32 was radiologically sampled. Approximately 75' x 75' of the SE portion of the concrete pad has been cleaned off to this point. A walkover survey using the Fidler was performed on the sidewalls beneath the pad in these areas. All material containing significant readings above background radiation levels in this area have been removed.

- A total of 99 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/11/99	**INSPECTION NO.:** MIC-076	**WEATHER:** Clear, High 70s
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in the Laydown Area. Progress reached approximately 50' west of the west limits of excavation in Grids 19 and 20. Excavation reached a depth of 1' below the concrete pad elevation and the area received a gamma scan walkover using a Fidler to ensure that no elevated radiological material existed within the excavation. Limits of the walkover survey were were surveyed by Sharp's Surveying to assist in controlling the horizontal extent of the area walked over to date.

- Excavation also continued in Grids 58 and 50. No grids were completed in this area during the shift.

- Removed material containing elevated radiological readings in the northernmost portion of Grid 57E and up to the 100-year flood plain, north of Grid 57. This area was identified as requiring additional removal in daily report MIC-073, dated 9/8/99. All material containing elevated radiological readings in these areas were adequately removed.

- A total of 84 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Don Rooney - MIC

MRP - Mining Residuals Pile

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/13/99	**INSPECTION NO.:** MIC-077	**WEATHER:** Overcast, Rain, Low 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 50 and 58. Grid 58N was completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, Grid 58N was radiologically sampled. The radiological sampling included a walkover survey of the area north of Grid 58 and south of the 100-year flood plain.

- Excavation also continued in the laydown area. No additional area was completed to grade due to the shift being cut short as a result of inclement weather.

- A total of 20 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Rain shut down all activities at approximately 9:15 A.M.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/14/99	**INSPECTION NO.:** MIC-078	**WEATHER:** Clear, Windy, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 50 and 58. Grid 58S was completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, Grid 58S was radiologically sampled.

- Excavation also continued in the Laydown Area and on the concrete pad. Progress within the Laydown Area reached approximately 50' west of the west limits of excavation in Grids 21 and 32. Excavation reached a depth of 1' below the concrete pad elevation and the area received a gamma scan walkover using a Fidler to ensure that no elevated radiological material was present within the excavation. Limits of the walkover survey were were surveyed by Sharp's Surveying to assist in controlling the horizontal extent of the area walked over to date.

- A total of 114 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 9/14/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/15/99	**INSPECTION NO.:** MIC-079	**WEATHER:** Clear, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 50, 60 and 47. Grid 47W was completed and were verified to grade by Sharp's Surveying. Upon completion of the survey, Grid 47W was radiologically sampled.

- Excavation also continued in the Laydown Area and on the concrete pad. Progress within the Laydown Area reached approximately 50' west of the west limits of excavation in Grids 21 and 32. Excavation reached a depth of 1' below the concrete pad elevation and the area received a gamma scan walkover using a Fidler to ensure that no elevated radiological material was present within the excavation. Limits of the walkover survey were were surveyed by Sharp's Surveying to assist in controlling the horizontal extent of the area walked over to date.

- A total of 129 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Attended weekly progress meeting.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Mike Kipper 9/15/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/16/99	**INSPECTION NO.:** MIC-080	**WEATHER:** P. Sunny, Windy, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 48 and 60. Grid 48W was completed and verified to grade by Sharp's Surveying. Upon completion of the survey, Grid 48W was radiologically sampled.

- Excavation also continued in the Laydown Area and on the concrete pad. Progress within the Laydown Area reached approximately 100' west of the west limits of excavation in Grids 20, 21 and 32. Excavation reached a depth of 1' below the concrete pad elevation and the area received a gamma scan walkover using a Fidler to ensure that no elevated radiological material was present within the excavation. Limits of the walkover survey were were surveyed by Sharp's Surveying to assist in controlling the horizontal and vertical extent of the area walked over to date.

- A total of 130 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/17/99	**INSPECTION NO.:** MIC-081	**WEATHER:** Clear, Mid 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grid 60. Due to the significant depth of excavation in this area, no grids were completed.

- Excavation also continued in the Laydown Area. Progress within the Laydown Area reached approximately 125' west of the west limits of excavation in Grids 20, 21 and 32. Excavation reached a depth of 1' below the concrete pad elevation and the area received a gamma scan walkover using a Fidler to ensure that no elevated radiological material was present within the excavation. Limits of the walkover survey were were surveyed by Sharp's Surveying to assist in controlling the horizontal and vertical extent of the area walked over to date.

- A total of 130 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- A berm existed on the west end of the concrete pad that served as a dike for potentially contaminated water collected on the concrete pad, preventing it from running into the plant. GLC broke through the berm, allowing water to flow off the pad and into the plant area. A PCB wipe sample was collected immediately west of the concrete pad where the water flowed out of the exclusion zone. The wipe sample will be sent to Sebesta and Associates in Cleveland, OH for PCB analysis.

SIGNED: (CQA INSPECTOR) SK 9/17

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-081	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Began cleaning of the concrete pad on the SE side. The pad was washed with a high volume of low pressure water.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC, Mike Lavery - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/17/94

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/18/99	**INSPECTION NO.:** MIC-082	**WEATHER:** Clear, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 60 and 49. Excavation was completed in Grid 60E and verified to meet design depths by Sharp's Surveying. Upon completion of the survey, Grid 60E was radiologically sampled. A majority of the bottom of Grid 60E consisted of a very dark clay which appeared to contain organics. The material closely resembled that which was encountered in Grids 100 and 101. USACE inspector Dennis Rimer expressed his concern that the soil may contain PCBs, therefore a soil sample was collected from the area which will be field analyzed on 9/20.

- Excavation also continued in the Laydown Area west of the west limits of excavation in Grids 20, 21 and 32. Material was pushed by a bulldozer from the furthest west portion of the Laydown Area toward the excavator loading the material. No areas were completed for a walkover survey by shift's end.

- A total of 85 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Completed cleaning of the south half of the concrete pad. Upon completion, the pad was walked over with the Fidler as well as large area wipe sampled for evidence of radiological contamination. The walkover identified several small hot spots that were

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-082	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

marked with orange paint and must be addressed before those areas of the pad can be considered clean. Two PCB wipe samples were also collected and will be transported to Sebesta & Associates in Cleveland, OH for analysis.

- Began grading subgrade for placement of the gravel road. Approximately 300' has been graded to date.

Visitors: Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Cliffy Kyser 9/18/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/20/99	**INSPECTION NO.:** MIC-083	**WEATHER:** Rain, Low 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grid 49. Excavation was completed in Grid 49E and verified to meet design depths by Sharp's. Surveying. Upon completion of the survey, Grid 60E was radiologically sampled.

- Excavation also continued in the Laydown Area west of the west limits of excavation in Grids 19, 20, 21 and 32. The SW corner of the Laydown Area was completed to a depth of one foot below the surface of the concrete pad. The completed area received a gamma scan walkover using the Fidler to ensure that no elevated radiological readings were present.
- A total of 28 trucks were loaded, inspected, manifested and shipped to the MIC landfill.
- Performed field analysis for PCBs of soil sample collected in Grid 60. Sample results indicated that the soil contained less than 3.1 mg/kg.
- Rain shut down all work activities at 9:45 A.M.

Visitors: Don Rooney - MIC, James East - MK

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 9/20/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/21/99	**INSPECTION NO.:** MIC-084	**WEATHER:** P. Sunny, High 50s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 60, 48 and 49. Excavation was completed in Grids 48E and 49W and verified to meet design depths by Sharp's Surveying. Upon completion of the survey, Grids 48E and 49W were radiologically sampled.

- Excavation also continued in the Laydown Area west of the west limits of excavation in Grids 19, 20, 21 and 32. The south half of the Laydown Area was completed to a depth of one foot below the surface of the concrete pad. The completed area received a gamma scan walkover using the Fidler to ensure that no elevated radiological readings were present.

- A total of 120 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Performed removal of radiological hot spots identified on the concrete pad. Concrete that possessed hot spots was removed using an air hammer that scabbled the concrete. Concrete was removed down to the point where no elevated levels of radiological material were detected by the Fidler.

- Received analytical results of PCB wipe samples collected on the south half of the concrete pad as well as the sample collected where potentially contaminated water ran out of exclusion zone as discussed in daily report MIC-081 on 9/17/99. Analytical results

SIGNED: (CQA INSPECTOR) 9/21

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-084	**PAGE** 2 **OF** 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

for samples W-15 (collected on the pad), W-16 (collected on the pad), and W-17 (collected where water ran out of the exclusion zone) all indicated PCB levels were < 10μg/100cm^2. Having acceptable results for both PCB and radiological wipe samples the south half of the pad was released from the exclusion zone. Radiological wipe samples were collected on the pad and checked for elevated levels on 9/18/99 as noted in daily report MIC-082.

Visitors: Don Rooney - MIC, Rick Hughes - MIC, James East - MK

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/21/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/22/99	**INSPECTION NO.:** MIC-085	**WEATHER:** P. Cloudy, Low 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 60 and 61. Excavation was completed in Grid 60W and verified to meet design depths by Sharp's Surveying. Upon completion of the survey, Grid 60W was radiologically sampled.

- Excavation also continued in the Laydown Area west of the west limits of excavation in Grids 19, 20, 21 and 32. The remainder of the Laydown Area was completed to a depth of one foot below the surface of the concrete pad. The completed area received a gamma scan walkover using the Fidler to ensure that no elevated radiological readings were present. The Laydown Area is now complete.

- Excavation also continued on the north half of the concrete pad. Excavation is not yet complete.

- A total of 131 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Began installation of gravel haul road on SE end of MRP. Approximately 200 linear feet of ODOT 304 stone was placed to a depth of 12 inches and compacted.

- Terese Van Donsel of USEPA was a visitor on site today. She was accompanied by Mark McGee of Sentry Environmental, a

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MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-085	**PAGE** 2 **OF** 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

contractor to USEPA. Mr. McGee performed a site walkover for the purpose of evaluating health and safety practices on site. Upon completion of his walkover, Mr. McGee did not identify any major health and safety concerns to RA personnel.

- Larry Jensen of USEPA and Chuck McCracken of ODH were also visitors on site today. Mr. Jensen and Mr. McCracken performed a radiological evaluation of site activities. Mr. Jensen identified a concern to Ms. Van Donsel that no radiological samples were being collected in the area between the north limit of excavation and the 100-year flood plain. As a result of this concern, the areas remaining to be excavated between the north excavation limits and the 100-year flood plain will be sampled if walkover surveys of these areas identify elevated levels of radiological material. Areas that have already been completed will be evaluated by USEPA before a decision is reached on radiological sampling requirements.

- Per Larry Jensen's request, a grab sample was collected on the east limits of excavation in Grid 41 beneath the nitrogen pipe.

- GLC removed the Dynapac Roller from site and brought in a Cat 563 Roller.

Visitors: Terese Van Donsel - USEPA, Larry Jensen - USEPA, Chuck McCracken - ODH, Mark McGee - Sentry Environmental, Don Rooney - MIC, Rick Hughes - MIC, James East - MK

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 9/22/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/23/99	**INSPECTION NO.:** MIC-086	**WEATHER:** Clear, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	Solar Testing - Technician
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation began in Grids 87, 75, 71 and 70. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 79, 80 and 61. No grids were completed in these areas.

- A total of 145 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Solar testing was on site to perform compaction testing on the north embankment fill area. All compaction tests were satisfactory.

- Received 15-minute count results of the radiological grab sample collected at the east excavation limits in Grid 41 beneath the nitrogen pipe. Results indicated the soil contained 22.9 pCi/g total radium. The area was marked off with caution tape as a controlled area until the material can be removed.

Visitors: Larry Jensen - USEPA, Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 9/23/99

MIC-026
2 of 4
SDK 10/1/99

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive Brooklyn Heights Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT

(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millennium Inorganic Chemicals Inc. Plant 2 Ashtabula	FILE NO.:	A990298
OWNER:		REPORT NO.:	
CONTRACTOR:		DATE:	9-23-99
SUBCONTRACTOR:			
TECHNICIAN(S):	Tim Suddith		

☒ STANDARD PROCTOR TEST ASTM D-698
☐ MODIFIED PROCTOR TEST ASTM D-1557

CURVE NO.	METHOD	MAXIMUM DRY DENSITY (LB/FT³)	% OPTIMUM MOISTURE
2	C	137.4	7.3
8	C	118.1	11.8
9	C	118.5	13.6

IF A PROCTOR IS UTILIZED FROM A DIFFERENT FILE, INCLUDE THE FILE NUMBER.

REQUIRED PERCENT COMPACTION: 95 %

RESULTS ☐ PASS ☐ FAIL REQUIREMENTS

SOURCE OF REQUIRED COMPACTION: Geo

CONTRACTOR INFORMED OF RESULTS: ☒ YES ☐ NO

COMMENTS:

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE.

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	26' South of FP16 304 Limestone	624	131.2	5.9	97.9	2
2	304 Limestone	624	130.4	6.5	96.9	2
3	14' From Strip 78 58 Grid	624	116.1	12.8	98.3	8
4	Between Grids 242+127 Grid 58	623.5	117.2	10.5	99.3	8
5	Center Grid 80	629	113.6	13.0	96.2	8

ADDITIONAL TESTS ON REVERSE

FIELD COPY ONLY

MIC-226
3 of 4 SDK 10/1/99

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
6	Rw Tak of Grid 60	629	113.6	13.7	96.2	8

ADDITIONAL COMMENTS: _____

FIELD COPY ONLY

MIC-086
4 of 4
SDK 10/1/99

DRAFT

RMI Environmental Services

Gamma Spectroscopy System

Sample Analysis for Ra-226 and Ra-228 (No Hold)

DRAFT

Spectrum Filename	Sample				Prep	Counting			Comments
	I.D.	Description	Weight (g)		date	date	live time (sec)		
99266201	990922601	East Limit	1760.0		23-Sep-99	23-Sep-99	900		Millennium MRP Excavation (not dried)

Nuclide	Activity (pCi/g)	Uncertainty (2-sigma)
Ra-226	20	20%
Ra-228	2.9	17%

Notes:

1) All uncertainties are expressed at the 95% confidence level and are counting uncertainties only. (additional uncertainty may occur in "light" or "heavy" sample densities in the form of a bias)

2) Samples that are "not full" or contain "voids" may have additional errors in the form of a bias.

3) Calculated activity values for Ra-228 assume secular equilibrium between Ac-228 and Ra-228.

4) Ra-226 value is calculated assuming that the 186 keV peak is completely due to Ra-226 with no U-235 interference.

REVIEW and APPROVAL :

_____

_____

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/24/99	**INSPECTION NO.:** MIC-087	**WEATHER:** Overcast, Periods of Rain, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 6-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation began in Grids 87, 75, 71 and 70. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 79, 80 and 61. A dozer is pushing through the grids to the excavator sitting in Grid 61. No grids were completed in these areas.

- A total of 83 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Rain shut down all activities from approximately 10:00 to 12:30.

- At approximately 1:00, the site was evacuated due to an MIC Plant 2 Oxide Facility leak. A cloud of material, later identified by the plant as $TiCl_4$, floated from the Oxide Facility, directly over the site. The cloud was covered an area comparable to the size of the site. All RA personnel remained away from the site until approximately 1:45, when plant personnel indicated that the all clear signal had been given.

-Two trailers were removed from service when it was discovered that one (TLE 4357) had a defective seal and the other (T91WQ)

SIGNED: (CQA INSPECTOR) 9/24

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-087	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

had a hole in the bottom of the trailer bed.

- GLC brought a Cat 613B scraper on site.

Visitors: Josef Shehabi - MIC, Don Rooney - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 9/24/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/25/99	**INSPECTION NO.:** MIC-088	**WEATHER:** Clear, Low 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 6-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation began in Grids 87, 75, 71 and 70. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 79, 80 and 61. A dozer is pushing through the grids to the excavator sitting in Grid 61. No grids were completed in these areas.

- A total of 96 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Trailers TLE 4357 and T91WQ were returned to service after a satisfactory inspection of the trailers was performed.

- Completed removal of stockpile on the north half of the concrete pad. The pad was then washed down. After drying, the north half of the pad was wipe sampled for PCBs. Wipe samples were sent to Sebesta and Associates in Cleveland, OH for analysis. The pad was also walked over for elevated radiological readings using a Fidler and large area wipe sampled. Areas of concrete containing elevated radiological readings were marked with orange spray paint for future removal.

- When performing a final walkover survey of the Laydown Area, it was identified that the NW corner of the area contained

SIGNED: (CQA INSPECTOR) DRL 9/25/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-088	**PAGE** 2 **OF** 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

elevated radiological readings. At the time the area was marked and covered with clean fill. GLC returned to the area and attempted to remove all material containing elevated readings. The attempt was unsuccessful and the area was again temporarily covered with clean fill until another attempt can be made.

- While attempting to remove the elevated radiological material in the NW corner of the Laydown Area. The utility pole in this location was discovered to contain elevated radiological readings. The pole was also covered temporarily with clean fill until it can be removed.

- Performed grading of Laydown Area in preparation for paving.

Visitors: Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/25/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/27/99	**INSPECTION NO.:** MIC-089	**WEATHER:** Overcast, Low 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 8-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation began in Grids 87, 75, 71 and 70. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 62, 61, 79, 80 and 83. A dozer is pushing through the grids to the excavator sitting in Grid 61. No grids were completed in these areas.

- A total of 130 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Received analytical results of PCB wipe samples collected on the north half of the concrete pad. Samples W-018 and W-019 indicated that the pad contained $<10\mu g/100cm^2$ PCBs.

- Removed areas of elevated radiological readings on the north half of the concrete pad. The concrete was removed using an air hammer. Upon completion of the removal, the north half of the pad was released from the exclusion zone.

- Excavation was completed in Grid 81 and north of the excavation limits, out to the 100-year flood plain. Upon completion, the area was surveyed by Sharp's Surveying to verify depth and then radiologically sampled.

SIGNED: (CQA INSPECTOR) 9/27

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-089	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Began installation of a berm immediately south of the gravel haul road. The berm is being installed by GLC at the request of MIC.

Installation of the berm is not associated with the RA.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 9/22/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/28/99	**INSPECTION NO.:** MIC-090	**WEATHER:** Clear, Low 80s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 8-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 86, 76, 68, 88, 72 and 74. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 62, 79 and 83. A dozer is pushing through the grids to the excavator sitting in Grid 61. No grids were completed in these areas.

- A total of 122 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Placed backfill in Grid 81. Fill was placed in 12" lifts and compacted.

- Installed gravel haul road from pavement at SE end of MRP to the concrete pad. The road was constructed using #1 stone placed over filter fabric.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/28/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/29/99	**INSPECTION NO.:** MIC-091	**WEATHER:** Heavy Rain, Mid 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 8-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 86, 76 and 68. A dozer is pushing through the grids to the excavator sitting in Grid 70. No grids were completed in this area.

- Excavation continued into Grids 62, 79 and 83. A dozer is pushing through the grids to the excavator sitting in Grid 61. No grids were completed in these areas.

- A total of 10 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Rain shut down waste hauling activities at approximately 8:30.

- Continued installation of gravel haul road from pavement at SE end of MRP to the concrete pad. The #1 stone was covered with 304 stone to complete the road.

- Collected radiological samples outside of the excavation limits in Grids 54 and 40.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC, Jim Williams - MK, Tom Davey - MK, Bruce Ehleringer - MK

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [signature] 9/29/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 9/30/99	**INSPECTION NO.:** MIC-092	**WEATHER:** P. Cloudy, Low 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 8-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excessive rain has caused the excavation to **become completely** filled with water. As a result, no waste hauling was performed. The excavation was pumped out into the **4000 gallon water** truck which transported water to the MIC Landfill. Additional water was pumped over unexcavated areas **of the MRP**. The excavation was approximately one half full by shifts end.

Visitors: Don Rooney - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Jeffrey Ryan 9/30/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/1/99	**INSPECTION NO.:** MIC-093	**WEATHER:** Clear, Low 60s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
5-Operators, 8-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 72, 86, 76 and 68. A dozer is pushing through the grids to the excavator sitting in Grid 70. While attempting to remove contaminated material against the concrete pad in Grids 72 and 73, several hot spots were identified that were not accessible from where the excavator was located. These areas were left behind to be removed when the power pole is removed in this area. No grids were completed in this area.

- Excavation continued into Grids 62, 78, 79 and 83. A dozer is pushing through the grids to the excavator sitting in Grid 62. Grids 79, 80, and 83S were completed and verified to grade by Sharp's Surveying. Upon completion of the survey, Grids 79, 80, 83S, and 61 were radiologically sampled.

- A total of 119 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Removed cover soil over the final small section on the NE corner of the concrete pad. Once the soil was removed, the pad was washed down and received a gamma scan walkover for radiological contamination. No contaminated areas were identified and the pad was released.

SIGNED: (CQA INSPECTOR) ic/1

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-093	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Continued dewatering of excavation from 9/29/99 **rain event**. Water was nearly gone by shift's end.

Visitors: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 10/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/2/99	**INSPECTION NO.:** MIC-094	**WEATHER:** Clear, High 70s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 3-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 84, 78, 64 and 62. A dozer is pushing through the grids to the excavator sitting in Grid 64. Grid 62 was completed and verified to grade by Sharp's Surveying. The south half of Grid 82 was also verified to grade including the adjacent area beyond excavation limits out to the 100-yr flood plain. Upon completion of the surveys, Grids 62 and 82S were radiologically sampled.

- An attempt was made to remove a hot spot in the NW corner of the proposed paved area. Although a considerable amount of material was removed, the crew was unable to chase out all material containing elevated radiological readings by shift's end.

- A total of 67 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Collected samples from area north of excavation limits in Grids 56 and 58 south of the 100-year flood plain. Each sample was field analyzed for PCBs. Results indicated that each sample contained < 3.1 mg/kg PCBs.

Visitors: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 10/2/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/4/99	**INSPECTION NO.:** MIC-095	**WEATHER:** Overcast, Light Rain, Low 50s °F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 84, 78, and 64. A dozer is pushing through the grids to the excavator sitting in Grid 66.

Grids 64, 78 and 84 S were completed and verified to grade by Sharp's Surveying. Upon completion of the surveys, Grids 64,.78 And 84S were radiologically sampled.

- Excavation continued in Grids 84, 78, and 64. A dozer is pushing through the grids to the excavator sitting in Grid 68. No grids were completed in this area.

- A total of 124 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Backfill placement resumed on the northeast portion of the remediated MRP. Backfill was placed in 12" lifts and compacted.

Visitors: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 10/4/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/5/99	**INSPECTION NO.:** MIC-096	**WEATHER:** P. Cloudy, High 50s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 85, 77 and 66. A dozer continues to push material to an excavator located in Grid 66. Grids 84S, 65, and 63 which had been previously surveyed were radiologically sampled.

- Excavation continued in Grids 86, 76 and 68. A dozer continues to push material to an excavator located in Grid 68. No grids were completed in this area.

- A total of 111 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 10/5/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/6/99	**INSPECTION NO.:** MIC-097	**WEATHER:** P. Cloudy, High 50s°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 85, 77 and 66. A dozer continues to push material to an excavator located in Grid 66.

- Continue excavation of hot spt in NW corner of proposed parking lot. Limits of elevated radiological readings were removed and the area was completed.

- Began decontamination of CAT 320 excavator.

- A total of 60 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Allan B Brillinger 10/6/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/7/99	**INSPECTION NO.:** MIC-098	**WEATHER:** Mostly clear, 35-55°F
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, 1 QA Personnel, Self	
Sharp's Surveying - Instrument Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 66, 68, 73, 76, and 77. A dozer continues to push material to excavator located in Grid 66.

- Komatsu Excavator R62 down from 0700 until 1530 with engine problem.

- Continue decontamination of CAT 320 excavator using pressure washer and manual cleaning.

- Hot spot was detcted in corner of Grid #73, underneath concrete slab, ~5 ft depth. Excavator used to chase elevated rad readings ~1 - 2 ft beneath slab, at which point the readings were still elevated.

- T. Cappello of USACE toured site and met with personnel to discuss H&S issues at the job site.

- A total of 57 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

Visitors: Josef Shehabi, R. Hughes- MIC, T. Cappello - USACE

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Allan B Bullanzi

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/8/99	**INSPECTION NO.:** MIC-099	**WEATHER:** Mostly clear, windy 55°F, increasing clouds throughout day, light rain at 5 PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 76, 77, 85, 86, and 87.. A dozer continues to push material to excavator located in Grid 84.

- A total of 65 trucks were loaded, inspected, manifested and shipped to the MIC landfill.

- Release survey performed on CAT 320 excavator.

- Decontamination, release surveys performed at landfill on 2 trailers.

- Excavated to grade and surveyed the following grids: 72, 73, 74, 88, 87, 75, 70, 71, 86, 76, 68, 89

- Release surveys performed on grids 66, 67N, 68, 69N, 70S, 71N, 72E, 75, 76, and 77

- Material excavated from gravel pad in planned parking area was placed in backfill area (~grids 80, 61, 60, 48). Material was found to have elevated rad counts, and was removed from backfill area and transported to landfill.

Visitors: Josef Shehabi, MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) William B Bullinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/11/99	**INSPECTION NO.:** MIC-100	**WEATHER:** Sunny, windy in AM, 50-65°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	
MK - 3 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
MIC - 1 Manifestor	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 330B Excavator (hauled off-site at noon)	Cat 613B Scraper
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavatd to grade and surveyed grids 82, 83N, 85SW, 94, 95.

- Continue excavation in grid 85
- A total of 61 trucks were loaded, inspected, manifested and shipped to the MIC landfill.
- Decontamination and release surveys performed at landfill on 4 trailers.
- Release surveys performed on grids 87,86, and 85SW.
- Elevated rad counts detected in grid 85N. Area was over excavated until rad counts were detected at 1.5x or less of background levels.

Visitors: Josef Shehabi, Don Rooney, MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) William B Bullinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/12/99	**INSPECTION NO.:** MIC-101	**WEATHER:** Clear AM, increasing clouds PM, 45-65°F,
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
4-Operators, 7-Laborers	Vellota Paving - 3 Laborers
MK - 3 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 3 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Dynapac Roller	D3 Dozer
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP -Continued excavating the following grids using the Komatsu excavators: 82,83N, 84, 90, 91, 92, 93, 94S, 95.

- Finished excavating to grade (GLC) and verifying design depth (Sharp's Surveying) the following grids: 82N, 83N, 84, 93, 94.

- Performed release sampling and surveying in the following grids: 82, 83, 84, 85, 93, and 95.

- Overexcavated the following areas due to elevated rad readings at the design elevation: 90, 89, 92, 93.

- Black/gray/white soil and cinders (Fill) encountered while overexcavating Grids 89 and 90. The fill extended into the embankment wall of the East Pond. Water began to seep from the fill in the embankment after it was exposed, leading to concerns about slope stability and piping of the embankment wall. Grids 89 and 90 were excavated to the point where rad readings were at acceptable levels. Two soil samples were then obtained, and the grids were backfilled to a point above the fill in the embankment. The backfilling appeared to stop the water infiltration from the East Pond.

- Dozer was decontaminated at the decon pad, and a PCB wipe sample was obtained. The dozer passed the radiation survey and equipment was released.

SIGNED: (CQA INSPECTOR)

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ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-101	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Vellotta Paving on-site to install geofabric in planned parking area.

Visitors:Don Rooney - MIC,

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) Allan B Brillinger

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/14/99	**INSPECTION NO.:** MIC-103	**WEATHER:** P Cloudy AM, Clear PM, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 5-Laborers	
MK -2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Easton Construction - 1 Foreman, 2 Operators	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 90, 91, 97, 98 and 99. Excavation was completed in Grids 97, 98 and 99 which were verified to meet design grades by Sharp's Surveying. No radiological samples were collected in these grids today.

- Performed excavation in an additional grid, south of the 100-year flood plain and east of Grid 99. No part of the grid was within the original excavation limits, therefore the grid was not assigned a grid number in the 100% RD. The grid will now be identified as Grid 99A. A portion of Grid 99A was completed and radiologically sampled. An additional radiological sample will be collected when the remainder of the grid is removed out to the extent of the 100-year flood plain. The completed portion was surveyed by Sharp's Surveying.

- A total of 50 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Easton Construction, a lower tier subcontractor to Velotta Paving, was on site to install ODOT 304 stone in the proposed parking area. 304 stone was placed over filter fabric in 12" lifts and compacted. Due to some heavy rain the previous evening, some of the subgrade soil has become soft, causing the soil to pump when equipment ran near it. In these pumped areas, some of the filter fabric

SIGNED: (CQA INSPECTOR) 10/14

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-103	**PAGE** 2 **OF** 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

was torn and will require removal and replacement prior to completing stone placement. The subgrade in these areas will also require removal and replacement.

- Larry Jensen of USEPA was on site today. Mr. Jensen performed a routine inspection of site radiological operations. Mr. Jensen did not indicate to RA personnel that he had any major issues or concerns.

Visitors: Larry Jensen - USEPA, Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) [illegible] 10/14/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/15/99	**INSPECTION NO.:** MIC-104	**WEATHER:** Clear . Low 50s° AM, Low 70s° PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	USACE - Inspector
3-Operators, 5-Laborers	
MK -2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Easton Construction - 1 Foreman, 2 Operators	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Excavation continued in Grids 90, 91, and 96. Excavation was completed in these grids which were verified to meet design grades by Sharp's Surveying. Upon completion of the survey, Grids 90, 91, 96, 97, 98 and 99 were radiologically sampled.

- In addition to the grids mentioned above, the east portions of Grids 74, 88 and 89 were radiologically sampled. These grids make up the east bank of MIC's stormwater collection pond. Grids 74, 88 and 89 still contain elevated radiological readings at the top of the bank, which make up the west portion of these grids. The slopes of the of the bank, however, have been adequately remediated and these were the portions of the grids that were sampled. The top of the bank will be remediated at a later date at which time it will be radiologically sampled.

- A total of 35 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- The main excavation within the MRP is now complete. Only small areas and several hot spots remain. Began decontamination of the Komatsu 220 excavator. The Komatsu 300 excavator is currently awaiting decontamination.

SIGNED: (CQA INSPECTOR) 10/15

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-104	**PAGE** 2 **OF** 4

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

- Easton Construction continued to install ODOT 304 stone in the proposed parking area. 304 stone was placed over filter fabric in 12" lifts and compacted.
- Continued placement of backfill on the north side of the remediated MRP. Fill was placed in 12" lifts and compacted.
- Solar Testing was on site today to perform testing of backfill material on the north end of the former MRP. All tests performed were found to be satisfactory.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

SIGNED: (CQA INSPECTOR) 11/15/99

MIC-104 3 of 4
10/15/99

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT

(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millenium Inorganic Chemical Plant 2 Ashtabula	FILE NO.:	H-990295
OWNER:	Millenium	REPORT NO.:	
CONTRACTOR:	Great Lakes Construction	DATE:	
SUBCONTRACTOR:			
TECHNICIAN(S):	Sinatra		

☒ STANDARD PROCTOR TEST ASTM D-698
☐ MODIFIED PROCTOR TEST ASTM D-1557

CURVE NO.	METHOD	MAXIMUM DRY DENSITY (LB/FT³)	% OPTIMUM MOISTURE
7		118.3	13.6
7		123.9	11.3

IF A PROCTOR IS UTILIZED FROM A DIFFERENT FILE, INCLUDE THE FILE NUMBER.

REQUIRED PERCENT COMPACTION: 95%

RESULTS ☐ PASS ☐ FAIL REQUIREMENTS

SOURCE OF REQUIRED COMPACTION: Millenium Engineer - Jeff

CONTRACTOR INFORMED OF RESULTS: ☒ YES ☐ NO

COMMENTS: Field copy requested by Jeff - Millenium Engineer

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE.

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	N-544.0 E 1145.0	629.20	126.8	11.2	102.4	7
2	N 618.9 E 1120.0	627.80	127.8	11.9	103.2	7
3	N 566.4 E 1084.1	630.6	127.4	10.5	102.9	7
4	N 618.9 E 1120.0	626.14	122.8	10.7	99.2	7

ADDITIONAL TESTS ON REVERSE

IELD COPY ONLY

MIC-104
4 of 4 10/15/99 SK

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
[illegible]	N ~~626.1~~ 610.2 E 1110.7	625.0 9" depth	123.6	11.2	99.8	7
7	N 609.8 E 1117.8	623.2 9" depth	128.3	9.9	103.7	7

ADDITIONAL COMMENTS: Locations and elevations provided by [illegible] (surveyor)

FIELD COPY ONLY

123.3

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/16/99	**INSPECTION NO.:** MIC-105	**WEATHER:** Clear , Low 50s° AM, Mid 70s° PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Easton Construction - 1 Foreman, 2 Operators	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Easton Construction, a lower tier subcontractor to Velotta Paving, was on site to perform repairs on the damaged fabric and deficient subgrade in the Laydown Area, identified in report MIC-103 on 10/14/99. Damaged fabric was removed as well as the soft subgrade. The removed subgrade was replaced with 304 stone which was then covered with new filter fabric. Upon completion of the fabric repair, the area was covered with 12" of 304 stone. With the exception of some minor fine grading, 304 stone placement in the proposed parking area is now complete.
- Completed decontamination of Komatsu 220 excavator. Excavator was visually inspected, wipe sampled for PCBs and surveyed for radiological contamination.
- Continued placement of backfill material in Grids 90, 91 and 97 of the former MRP. Fill was placed in 12" lifts and compacted.

Visitors: None

SIGNED: (CQA INSPECTOR) [illegible signature] 10/16/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/18/99	**INSPECTION NO.:** MIC-106	**WEATHER:** P. Cloudy, Mid 50s° PM
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Removed remaining material in Grid 99A out to the 100-year flood plain. Once completed, the area was surveyed by Sharp's Surveying and radiologically sampled.

- A total of 14 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Began removal of silt fence along south end MRP.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

PPA - Performed excavation of Area "A". A foundation wall was encountered in the excavation that continued out beyond the excavation limits and below the required excavation depth of 4'. Once excavation reached required grades, the foundation wall was cleaned off, surveyed by Sharp's Surveying and wipe sampled. The excavation bottom was also surveyed to verify design depths had been met and the soil was sampled. Both the wipe sample and the soil sample were field analyzed for PCBs. Results indicated that each sample contained < 50 mg/kg PCBs.

SIGNED: (CQA INSPECTOR) 10/18

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-106	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) 10/18/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/19/99	**INSPECTION NO.:** MIC-107	**WEATHER:** P. Cloudy, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued removal of silt fence along south end of MRP. Removed fencing and stone was loaded in trucks and shipped to MIC's landfill. All removed areas received a gamma scan walkover to ensure no radiological contamination was left behind.

- A total of 13 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

PPA - Performed excavation of Area "D". The northern limits of the excavation were located within a concrete walled water channel, therefore the north limits of excavation were terminated at the concrete channel wall. Once excavation reached required grades, the limits of excavation were surveyed by Sharp's Surveying and the soil was sampled. The sample was field analyzed for PCBs. Results indicated that the sample contained < 50 mg/kg PCBs.

- Backfilled Areas "A" and "D" with ODOT 304 stone. Stone was placed in 12" lifts and compacted.

SIGNED: (CQA INSPECTOR) SK 10/19

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-107	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) 10/19/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/20/99	**INSPECTION NO.:** MIC-108	**WEATHER:** Clear A.M., Cloudy P.M., Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued removal of silt fence along north end of MRP. Removed fencing and stone was loaded in trucks and shipped to MIC's landfill. The stone trench will not be removed where the silt fence was installed north of the 100-year flood plain.

- Began removal of radiological hot spot in Grid 103 beyond the north limits of excavation, south of the 100-year flood plain. Work was not yet complete by shift's end.

- Performed removal of radiological hot spot beneath nitrogen pipe in Grids 39 and 41. Removal was completed and Grids 39E and 41E were radiologically sampled.

- A total of 7 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

PPA - Performed excavation of Area "B". The eastern limits of the excavation were located within a concrete walled water

SIGNED: (CQA INSPECTOR)

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-108	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

channel, therefore the north limits of excavation were terminated at the concrete channel wall. Once excavation reached required grades, the limits of excavation were surveyed by Sharp's Surveying and the soil was sampled. The sample was field analyzed for PCBs. Results indicated that the sample contained < 50 mg/kg PCBs.

- Backfilled Area "B" with ODOT 304 stone. Stone was placed in 12" lifts and compacted.

- Began excavation of Area "E".

General - Dennis Rimer of USACE has arrived on-site to replace John Bresnahan as USEPA's on-site representative for the remainder of the Remedial Action.

- Terese Van Donsel of USEPA and Chuck McCracken of ODH were on site today to participate in the Pre-Final Inspection. They were given a site tour and provided a punchlist for their review and comment. Specific details of the inspection can be found in the Pre-Final Inspection Report, dated October 30, 1999.

- Attended weekly progress meeting.

Visitors: Terese Van Donsel - USEPA, Chuck McCracken - ODH, Sook Reid - USACE, Randy Barnes - Ashtabula Co. Health Dept. Don Rooney - MIC, Josef Shehabi - MIC, Rick Hughes - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) [signature] 11/1/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/21/99	**INSPECTION NO.:** MIC-109	**WEATHER:** Cloudy A.M., Clear P.M., Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 1 Rad Technician	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	
Komatsu PC300LC Excavator	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued removal of radiological hot spot in Grid 103 beyond the north limits of excavation, south of the 100-year flood plain. The hot spot has run back into previously backfilled areas, beneath the depth of excavation that was previously achieved in Grids 103 and 102. The limits of the hot spot were not located by shift's end.

- A total of 14 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted. Solar testing was on site and performed compaction testing in this area. All tests were found to be satisfactory.

- Completed decontamination of PC300 excavator. Excavator was inspected, PCB wipe sampled and radiologically sampled.

- Field analyzed soil sample for PCBs of the sample collected in the radiological hot spot beneath concrete in Grid 73. Results indicated that the soil contained > 3.1 mg/kg. The sample will be analyzed for 50 mg/kg.

SIGNED: (CQA INSPECTOR) 10/21

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-109	PAGE 2 OF 4

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

PPA - Continued excavation of Area "E". The 3' excavation on the north side of the area was completed to grade, visually inspected for contamination and surveyed to verify design depths by Sharp's Surveying. A soil sample was also collected and field analyzed for PCBs. Results indicated that the sample contained < 50 mg/kg PCBs.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) 10/21/99

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10/21/99

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT
(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millenium Inorganic Chemicals Plant 2 - Ashtabula	FILE NO.:	A990298
		REPORT NO.:	
OWNER:	Millenium	DATE:	10-21-99
CONTRACTOR:	Great Lakes Construction		
SUBCONTRACTOR:			
TECHNICIAN(S):	Janet Schultz		

☒ STANDARD PROCTOR TEST ASTM D-698
☐ MODIFIED PROCTOR TEST ASTM D-1557

CURVE NO.	METHOD	MAXIMUM DRY DENSITY (LB/FT³)	% OPTIMUM MOISTURE
7	C	123.9	11.3
8	C	118.1	11.8
2	C	137.4	7.3

IF A PROCTOR IS UTILIZED FROM A DIFFERENT FILE, INCLUDE THE FILE NUMBER.

REQUIRED PERCENT COMPACTION: 95%

RESULTS ☐ PASS ☐ FAIL REQUIREMENTS

SOURCE OF REQUIRED COMPACTION: Gene Marks - Sup't
Jeff - Engineer on site

CONTRACTOR INFORMED OF RESULTS: ☒ YES ☐ NO

COMMENTS: Tests 9-12 parking lot area
Area "A-D" Failed due to ground H_2O

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE.

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	N-554.1 E-1190.3 (8" depth)	632.4	121.9	11.8	98.4	7
2	N-539.6 E 1257.6 (7" depth)	632.6	122.2	13.6	98.7	7
3	N 535.4 E 932.6	624.8	117.1	13.3	99.2	8
4	N-581.5 E-928.6	624.2	119.9	14.2	101.5	8
5	N 665.7 E 920.3	624.5	108.5	13.0	91.8	8

ADDITIONAL TESTS ON REVERSE

FIELD COPY ONLY

[redacted]

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10/21/99
SK

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT³)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
6	N- 686.8 E 918.5	624.1	123.2	10.7	99.4	8
7	area "B see remarks	finish	—	—	—	2
8	area "B" see remarks		89.±	13.3	—	2
9	Parking Lot area 66's of concrete	finish	134.0 3" depth	6.2	97.5	2
10	18' W of E edge 66's of concrete		135.1 3" depth	4.7	98.4	2
11	15' E of W edge 93' N of CB		139.3 3" depth	6.5	101.4	2
12	101' N of S edge 84' E of cooling tower		137.2 3" depth	5.9	99.9	2
13	area "B" 7" depth		135.5	7.0	98.6	2

ADDITIONAL COMMENTS: Whole area noted shifting. Area to be re-excavated and 57-25 to be added then re-rolled / tested.

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/22/99	**INSPECTION NO.:** MIC-110	**WEATHER:** Cloudy, 50°F, intermittent light rain throughout day, windy
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman	USACE - Inspector
3-Operators, 5-Laborers	
MK - 2 HP Personnel, Self	
Sharp's Surveying - Instrument Man, Rod Man	
RMI - 2 Rad Technicians	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	2 - D6 Dozers
Cat 563 Roller	D3 Dozer
Komatsu PC300LC Excavator (shipped offsite in AM)	Cat 613B Scraper

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued excavation of grids 102 and 103 while chasing seam with elevated rad levels. Excavation continued up to "Stop" line adjacent to East Pond berm. Area was then rad surveyed, sampled, and released.

- Excavated rad sample areas in grids 83 and 96. Rad technicians resampled these two grids.
- GLC excavated top of East Pond berm (grids 89, 88, and 74).
- Rad technicians surveyed, sampled and released grids 73, 74, 88, and 89.
- Continued backfilling in area north of concrete pad. Backfill material was spread in lifts of < 1 ft with D6 dozer pulling a sheepsfoot roller.
- 6 trucks of contaminated soil were checked, manifested and sent to the MIC landfill for disposal.

PPA - Continued excavation in Area E. Encountered abandoned drain line, water line and building footer in the 9' excavation. Laborer in excavation encountered fumes that made him dizzy when the drain line was uncovered. Laborer then came out of the excavation and GLC monitored the excavation. Once fumes dispersed, GLC began to excavate again and encountered a water

SIGNED: (CQA INSPECTOR) ABB 10/22

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-110	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

supply line with a 90° bend at approx. 8' depth. The pipe was supported by a thrust block at the bend. GLC stopped excavation to re-evaluate obstructions in the excavation. Water was entering excavation from the abandoned drain line and several seeps in the excavation walls.

Other - GLC crew dismantled equipment decon. area. Komatsu 300 excavator was shipped from the site in the AM. GLC to remove silt fence from north haul road area.

Visitor's: Josef Shehabi - MIC, Don Rooney - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) Allan B Brillinger 10/22

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/25/99	**INSPECTION NO.:** MIC-111	**WEATHER:** Clear, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Easton Construction - Forman, 2 Operators	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Field analyzed soil sample for PCBs of the sample collected in the radiological hot spot beneath concrete in Grid 73.

Results indicated that the soil contained slightly > 50 mg/kg. The sample was shipped to EA Group in Mentor, OH to be analyzed for a more precise PCB level.

- Began removal of stone on top of the east stormwater pond. Material is being loaded into trucks and shipped to MIC's landfill.

- A total of 5 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

- Easton Construction was on site to perform grading on the stone at the west end of the proposed parking area in the Laydown Area

PPA - Continued excavation of the south half of Area "E". Excavation reached the required 9' depth in east portions of the excavation, however many of the remaining areas contain utilities that make it nearly impossible to excavate further. Material

SIGNED: (CQA INSPECTOR) JK 10/25

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/26/99	**INSPECTION NO.:** MIC-112	**WEATHER:** Clear, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 2 HP Personnel, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Continued removal of stone on top of the east stormwater pond. Material is being loaded into trucks and shipped to MIC's landfill. A total of 12 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

- Performed removal of soft spot in proposed parking area in the Laydown Area.

PPA - Performed additional excavation in Area "E" where samples contianed > 50 mg/kg PCBs. Upon reaching what appeared to be visually clean soil, new samples were collected and field analyzed for PCBs. Results indicated that the areas contained < 50 mg/kg PCBs. After receipt of the sample results, Area E was backfilled with LSM 50 (flowable fill) up to within approximately 3' of final grade.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) JK 10/26/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/27/99	**INSPECTION NO.:** MIC-113	**WEATHER:** Cloudy A.M., Clear P.M., High 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 1 HP Technician, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Velotta Paving - Foreman, Operator	
USACE - Inspector	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Completed removal of stone on top of the east stormwater pond. Material was loaded into trucks and shipped to MIC's landfill. A total of 14 trucks were loaded, inspected, manifested and shipped to MIC's landfill.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

- Placed tack coat over 304 stone in proposed parking area in the Laydown Area.

- Received PCB analysis results of the sample collected beneath the concrete pad in Grid 73. The results were 76 mg/kg.

PPA - Installed concrete in Areas "A" and "D". Area "A" is now completely restored.

- Attended weekly progress meeting.

Visitors: Sook Reid - USACE, Don Rooney - MIC, Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) [illegible] 10/27/99 10/27/99 SK 10/27

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/28/99	**INSPECTION NO.:** MIC-114	**WEATHER:** Clear, Low 40s° A.M., High 60s° P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 5-Laborers	
MK - 1 HP Technician, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Velotta Paving - Foreman, Operator, 4 - Laborers	
USACE - Inspector	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Performed hand excavation of hot spot beneath concrete pad beyond excavation limits of Grid 73. Material was removed until no elevated radiological readings were present. The area was then sampled radiologically and for PCBs. PCB field analysis results indicated that the soil contained approximately 3.1 mg/kg PCBs.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

- Velotta Paving installed 3" minimum base course pavement over 304 stone in Laydown Area.

PPA - Installed 304 stone backfill over cured flowable fill in Area "E". Area "E" is ready to receive paving.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

SIGNED: (CQA INSPECTOR) 10/28/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 10/29/99	**INSPECTION NO.:** MIC-115	**WEATHER:** Clear, Low 50s° A.M., Mid 70s° P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 4-Laborers	
MK - 1 HP Technician, 1 QA Personnel	
Sharp's Surveying - Instrument Man, Rod Man	
Velotta Paving - Foreman, Operator, 4 - Laborers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

MRP - Velotta Paving installed 3" minimum wearing course pavement over base course in Laydown Area. Solar Testing was on site and perform gradation and compaction testing on the new pavement.

- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.

- Completed decontamination of PC220 excavator. With all equipment having been released, one final truckload of contaminated material was loaded, inspected, manifested and shipped to MIC's landfill. The truck contained residuals from the decon pad.

North Traffic Area - Installed filter fabric in areas to receive erosion protection. All filter fabric is complete, but the 6" 304 stone layer is not.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) 10/29/99

MIC-115
2 of 5

10/29/99

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX (216) 741-7011

ASPHALT COMPACTION REPORT

(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millennium Inorganic Chemicals Inc Plant 2 Ashtabula	FILE NO.:	A99C288
CLIENT:	The Great Lakes Const. Co.	REPORT NO.:	
OWNER:		DATE:	10-29-99
CONTRACTOR:		OTHER:	
SUBCONTRACTOR:	Velotta Paving Co. Ph# 942-6655	TEMPERATURE (°F):	70°
TECHNICIAN(S):	Tim Sudduth	WEATHER:	Sunny

(Page #1)

TEST NO.	MATERIAL	UNIT WEIGHT
1	~~[illegible]~~ 402	144.6
2	403/404	143.0

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE

REQUIRED PERCENT COMPACTION: 95%

RESULTS: ☐ PASS ☐ FAIL REQUIREMENTS

SOURCE OF REQUIRED COMPACTION: Gene

CONTRACTOR INFORMED OF RESULTS? ☒ YES ☐ NO

COMMENTS:

TEST NO.	LOCATION	ELEVATION	IN-PLACE WET DENSITY (LB/FT³)	PERCENT MARSHALL
1	20' East Northwest corner of Existing Concrete 8' South of Existing Concrete (402)	633.84	143.0	98.9
2	16' S From North Edge Concrete 100' E. From West End of Concrete)	"	148.1	102.4
3	Retest of 2 12' From North Edge 102' East of West End	"	144.7	100.1
4	15' south of North Edge 180' East of West Edge	"	144.3	99.8
start of 404 5	48' East of West Edge 4' north of South Edge (Lane 1)	633.94	142.2	99.4

ADDITIONAL TESTS ON REVERSE

FIELD COPY ONLY

Sec 5
10/29/94 JR

TEST NO.	LOCATION	ELEVATION	IN-PLACE WET DENSITY (LB/FT³)	PERCENT MARSHALL
6	16' North of South Edge 42' East of West Edge (Lane 2)	633.94	141.6	[illegible]
7	15' North of South Edge 35' West of East Edge (Lane 2)	"	140.3	[illegible]
8	26' North of South Edge 134' East of West Edge (Lane 3)	"	138.8	97.6
9	26' North of South Edge 26' West of East Edge (Lane 4)	"	142.1	99.4
10	100' West of East Edge 40' North of South Edge (Lane 5)	"	139.2	97.3
11	40' North of South Edge [illegible] East of West Edge (Lane 5)	"	138.2	96.7
12	50' North of South Edge 30' East of West Edge (Lane 6)	"	139.2	97.4
13	62' North of South Edge 114' East of West Edge (Lane 7)	"	136.2	95.3
14	64' West of the East Edge 79' North of South Edge (Lane 8)	"	141.5	98.9
15	56' East of West Edge 72' North of South Edge (Lane 8)	"	139.8	97.8

ODDITIONAL COMMENTS:

ELD COPY ONLY

MIL-115
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10/28/99

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX (216) 741-7011

ASPHALT COMPACTION REPORT

(NUCLEAR MOISTURE/DENSITY METHOD)

PROJECT:	Millennium Inorganic Chemical Inc Plant 2 Ashtabula	FILE NO.:	19902.98
CLIENT:	The Great Lake Const. Co	REPORT NO.:	
OWNER:		DATE:	10-29-99
CONTRACTOR:		OTHER:	
SUBCONTRACTOR:	Velotta Paving Co.	TEMPERATURE (°F):	70°
TECHNICIAN(S):	Tim Sudduth	WEATHER:	Sunny

(Page #2)

TEST NO.	MATERIAL	UNIT WEIGHT
2	403/404	143.0

TECHNICIANS ARE REQUIRED TO READ THE PLANS AND SPECIFICATIONS IF AVAILABLE

REQUIRED PERCENT COMPACTION: 95%

RESULTS: ☐ PASS ☐ FAIL REQUIREMENTS

SOURCE OF REQUIRED COMPACTION: Gene

CONTRACTOR INFORMED OF RESULTS? ☒ YES ☐ NO

COMMENTS:

TEST NO.	LOCATION	ELEVATION	IN-PLACE WET DENSITY (LB/FT³)	PERCENT MARSHALL
16	86' North of South Edge 170' East of West Edge (Lane 9)	633.94	140.3	98.1
17	94' North of South Edge 114' East of West Edge (Lane 10)	"	137.9	97.8
18	100' North of South Edge 114' East of West Edge (Lane 11)	"	137.4	96.1
19	108' North of South Edge 270' East of West Edge (Lane 11)	"	137.6	96.2
20	116' North of South Edge 270' East of West Edge (Lane 12)	"	138.6	96.9

ADDITIONAL TESTS ON REVERSE

FIELD COPY ONLY

TEST NO.	LOCATION	ELEVATION	IN-PLACE WET DENSITY (LB/FT³)	PERCENT MARSHALL
	174' East of West Edge			
21	124 north of South Edge (Lane 13)	633.94	136.7	95.6

ADDITIONAL COMMENTS: _____

FIELD COPY ONLY

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/01/99	**INSPECTION NO.:** MIC-116	**WEATHER:** Cloudy, Fog, Low 50s° A.M., Clear, Low 70s° P.M.
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
4-Operators, 4-Laborers	
MK - 1 HP Technician, 1 QA Personnel	
Velotta Paving - Foreman, Operator, 4 - Laborers	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer
Cat 613B Scraper	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Velotta Paving completed 3" minimum wearing course pavement over base course in Laydown Area. Velotta also completed pavement in Areas "B", "D", and "E" within the Plant Process Areas and performed minor repairs on potholes in Middle. Road.
- Continued placement of backfill along the north side of the remediated MRP adjacent to the stormwater pond. Fill was placed in 12" lifts and compacted.
- Repaired PVC drain pipe in Grid 73 where hot spot was removed.
- Cleaned out RR tracks at road crossing.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) 11/01/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/03/99	**INSPECTION NO.:** MIC-117	**WEATHER:** Sleet, Snow, Mid 30s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman, Health and Safety Officer,	
1-Operator, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Heavy rain resulted in no work performed on 11/02/99, therefore, no report was developed. The decontamination trailer was removed from site on 11/02.
- Installed 6" ODOT 304 stone over filter fabric as erosional cover around the settling basins. Stone placement was nearly complete by shift's end.
- Removed 613B Scraper from site.
- Attended weekly progress meeting.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/3/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/04/99	**INSPECTION NO.:** MIC-118	**WEATHER:** Clear, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman	
1-Operator, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	2 - 4000 Gal. Water Trucks
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- As a result of wet conditions, the only work activities performed were dewatering and site grading.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 11/4/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/05/99	**INSPECTION NO.:** MIC-119	**WEATHER:** Clear, Mid 60s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Foreman	
1-Operator, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	4000 Gal. Water Truck
Cat 950B Loader	Fuel Truck
Ford 7500 Loader/Hoe	D6 Dozers
Cat 563 Roller	D3 Dozer

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued installation of gravel haul road. Approximately 50' was completed.
- Performed dewatering and site grading.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/5/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/08/99	**INSPECTION NO.:** MIC-120	**WEATHER:** Clear, Mid 60s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
3-Operators, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	D3 Dozer
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued installation of gravel haul road.
- Continued installation of clay around stormwater ponds.
- Restored asphalt walkway to clarifier in North Traffic Area.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) 11/8/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/09/99	**INSPECTION NO.:** MIC-121	**WEATHER:** Clear, Mid 70s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
3-Operators, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	D3 Dozer
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued installation of gravel haul road.
- Continued installation of clay around stormwater ponds.
- Restored asphalt walkway to clarifier in North Traffic Area.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/9/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/10/99	**INSPECTION NO.:** MIC-122	**WEATHER:** Cloudy, Mid 60s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
3-Operators, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	D3 Dozer
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued installation of gravel haul road.
- Completed installation of clay around stormwater pond. Once completed, placement of the non-erosional filter fabric and 6" gravel cover began.
- Continued placement of topsoil over former MRP.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) Mike Ryan 11/10/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/11/99	**INSPECTION NO.:** MIC-123	**WEATHER:** P. Cloudy, Mid 40s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
3-Operators, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	D3 Dozer
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued installation of gravel haul road.
- Completed placement of the non-erosional filter fabric and 6" gravel cover.
- Continued placement of topsoil over former MRP.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] Kyser 11/11/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/12/99	**INSPECTION NO.:** MIC-124	**WEATHER:** Clear, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
3-Operators, 1-Laborer	
MK - 1 HP Technician, 1 QA Personnel	

MAJOR EQUIPMENT ON-SITE	
Komatsu PC220LC Excavator #R98	D3 Dozer
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued placement of topsoil over former MRP.
- Velotta Paving came on site and performed sealing of new pavement to existing surface in Laydown Area and Plant Process Areas "A", "B", "C", and "D".
- Received extraction, gradation and Marshall testing results performed by Solar Testing on the new pavement. All results were satisfactory.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [signature] 11/12/99

4IC - 124
2 of 5
11/12/99
SK

ASPHALT LABORATORY TESTING

Extraction, Gradation, and Marshal Testing
402 404 Asphalt
November 1, 1999 / Grand River Asphalt

Project:	**Millennium Inorganic Chemicals**	**Date:**	Nov. 1, 1999
Contractor:	**Great Lakes Construction Company**	**Activity:**	
Lab. Technician:	**Mr. Jack Walsh**		
Engineer:	**Doug Perisutti, P.E.,CPG**	Asphalt Laboratory Testing	
File Number:	**A990289x24**		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
402	147.5	2.364	98.3%	96-98%

Sieve Size	ODOT 402.02 Limits Percent	JMF Percent	Percent Passing
1.5"	100	100	100
1"	95-100	100	100
0.75"			93
0.5"	60-90	77	69
0.375"			62
#4	35-65	50	47
#8			40
#16	15-45	32	35
#30			29
#50	3-22	8	16
#100			6
#200	0-8	2.8	3.5
Asphalt Content	4.0 - 12.0%	5.7%	6.3%

Comments:

Material is composed of limestone and natural sand
Average in-place density from October 29, 1999

SOLAR TESTING LABORATORIES, INC.

Douglas J. Perisutti, P.E., CPG

MIC-124
3 of 5
11/12/99
JR

ASPHALT LABORATORY TESTING

Extraction, Gradation, and Marshall Testing
402 404 Asphalt
November 1, 1999 / Grand River Asphalt

Project:	**Millennium Inorganic Chemicals**	**Date:**	Nov. 1, 1999
Contractor:	**Great Lakes Construction Company**	**Activity:**	
Lab. Technician:	**Mr. Jack Walsh**		
Engineer:	**Doug Perisutti, P.E.,CPG**	Asphalt Laboratory Testing	
File Number:	**A990209x24**		

Material	Unit Weight pcf	Bulk Specific Gravity	Average In-place Density	Require % Compaction
404	140.1	2.245	99.5%	96-98%

Sieve Size	ODOT 404.02 Limits Percent	JMF Percent	Percent Passing
0.5"	100	100	100
0.375"	90-100	94	98
#4	45-75	60	65
#8			52
#16	25-45	37	46
#30			39
#50	3-22	1[illegible]	4
#100			5
#200	0-8	3.0	3.4
Asphalt Content	4.5 - 12.0%	6.2%	6.1%

Comments:

Material is composed of limestone and natural sand
Average in-place density from October 29, 1999

SOLAR TESTING LABORATORIES, INC.

Douglas J. Perisutti, P.E., CPG

ASPHALT COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Tim Sudduth
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990389x24

Date:	Oct. 29, 1999	Page 1/2
Activity:		
Asphalt Placement		
Require % Compaction		96-98%

Test Number	Material	Unit Weight pcf
1	402	144.6/147.5
2	403/404	143.0/140.1
		Design/Actual

Test No.	Location	Elevation from top of grade	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
1	20' E of NW corner /8' S of concrete	633.74	143.0	98.9%	96.9%		P	402
2	16' from N edge / 100' E of W end	633.74	148.1	102.4%	100.4%		P	402
3	12' from N edge / 102' E of W end	633.74	144.7	100.1%	98.1%		P	retest of #2 (404)
4	15' S of N edge / 190' E of W edge	633.74	144.3	99.8%	97.8%		P	402
5	48' E of W edge / 4' N of S edge (line 1)	633.94	142.2	99.4%	101.5%		P	404
6	16' N of S edge / 42' E of W edge (line 2)	633.94	141.0	98.6%	100.6%		P	404
7	15' N of S edge / 30' W of E edge (line 2)	633.94	140.3	98.1%	100.1%		P	404
8	26' N of S edge / 134' E of W edge (line 3)	633.94	138.8	97.1%	99.1%		P	404
9	26' N of S edge / 26' W of E edge (line 4)	633.94	142.1	99.4%	101.4%		P	404
10	100' W of E edge / 40' N of S edge (line 5)	633.94	139.2	97.3%	99.4%		P	404
11	40' N of S edge / 28' E of W edge (line 5)	633.94	138.2	96.6%	98.6%		P	404
12	50' N of S edge / 30' E of W edge (line 6)	633.94	139.2	97.3%	99.4%		P	404
13	62' N of S edge / 114' E of W edge (line 7)	633.94	136.2	95.2%	97.2%		P	404
14	64' W of E edge / 79' N of S edge (line 8)	633.94	141.5	99.0%	101.0%		P	404
15	56' E of W edge / 72' N of S edge (line 8)	633.94	139.8	97.8%	99.8%		P	404

Comments:

Subcontractor: Velotta Paving

All distances are from existing concrete.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

MC-124
4 of 5
11/3/99

SOIL COMPACTION REPORT
Nuclear Moisture/Density Method

Project: Millennium Inorganic Chemicals
Contractor: Great Lakes Construction Company
Technician: Mr. Tim Suddath
Engineer: Doug Perisutti, P.E.,CPG
File Number: A990289x24

Date: Oct. 29, 1999 **Page 2/2**
Activity:
Asphalt Placement

Require % Compaction 96-98%

Test Number	Material	Unit Weight pcf
1	402	144.6/147.5
2	403/404	143.0/140.1
		Design/Actual

Test No.	Location	Elevation from top of grade	In-Place Wet Density (pcf)	% Marshall Design	% Marshall Actual		Pass (P) Fail (F)	Notes:
16	86' N of S edge / 170' E of W edge (line 9)	633.94	140.3	98.1%	100.1%		P	404
17	94' N of S edge / 114' E of W edge (line 10)	633.94	139.8	97.8%	99.8%		P	404
18	100' N of S edge / 114' E of W edge (line 11)	633.94	137.4	96.1%	98.1%		P	404
19	108' N of S edge / 278' E of W edge (line 11)	633.94	137.6	96.2%	98.2%		P	404
20	116' N of S edge / 278' E of W edge (line 12)	633.94	138.6	96.9%	98.9%		P	404
21	174' E of W edge / 124' N of S edge (line 13)	633.94	136.7	95.6%	97.6%		P	404

Comments:
Subcontractor: Velotta Paving
All distances are from existing concrete.

Douglas J. Perisutti, P.E., CPG

SOLAR TESTING LABORATORIES, INC.

5 of 5

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/13/99	**INSPECTION NO.:** MIC-125	**WEATHER:** P. Cloudy, Low 60s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, Health and Safety Officer	
2-Operators, 1-Laborer	
MK - QA Personnel	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued placement of topsoil over former MRP.
- Continued installation of gravel haul road.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/13/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/15/99	**INSPECTION NO.:** MIC-126	**WEATHER:** Cloudy, Low 40s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, 2-Operators, 1-Laborer	
MK - QA Personnel	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Continued placement of topsoil over former MRP.
- Continued installation of gravel haul road.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible signature] 11/15/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/16/99	**INSPECTION NO.:** MIC-127	**WEATHER:** Overcast, Mid 30s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, 2-Operators, 1-Laborer	
MK - QA Personnel	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Completed placement of topsoil over former MRP.
- Continued installation of gravel haul road.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible signature] 11/16/99
MC

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/17/99	**INSPECTION NO.:** MIC-128	**WEATHER:** P. Cloudy, Mid 30s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, 2-Operators, 1-Laborer	
MK - QA Personnel	
Czach Seeding - 1 Foreman, 2 Laborers	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Czach Seeding arrived on site today and prepared the topsoil over the former MRP to receive seeding.
- Continued installation of gravel haul road.
- Attended weekly progress meeting.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/17/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/18/99	**INSPECTION NO.:** MIC-129	**WEATHER:** P. Cloudy, Mid 50s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ Facility, Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, 2-Operators, 1-Laborer	
MK - QA Personnel	
Czach Seeding - 1 Foreman, 2 Laborers	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Czach Seeding was on site again today and seeded and mulched the former MRP and the MIC Landfill borrow areas. Seeding is now complete.
- Continued installation of gravel haul road.
- Performed general cleanup of site.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/18/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

DATE: 11/19/99	**INSPECTION NO.:** MIC-130	**WEATHER:** Clear, Mid 60s°
SITE: Millennium Inorganic Chemicals, Plant 2, $TiCl_4$ **Facility,** Ashtabula, OH		**CONTRACTOR:** Great Lakes Construction (GLC)

MANPOWER/PERSONNEL	
GLC - Superintendent, 2-Operators, 1-Laborer	
MK - QA Personnel	

MAJOR EQUIPMENT ON-SITE	
D3 Dozer	
Cat 950B Loader	
Ford 7500 Loader/Hoe	
Cat 563 Roller	
Fuel Truck	
D6 Dozer	

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS:

- Completed installation of gravel haul road.
- Completed general cleanup of site.
- GLC demobilized from site.
- The RA work is now complete. No further daily QA reports will be developed for the RA work.

Visitors: Don Rooney - MIC

SIGNED: (CQA INSPECTOR) [illegible] 11/19/99

MORRISON KNUDSEN CORPORATION
ENGINEERS AND CONSTRUCTORS - ENVIRONMENTAL GROUP

CONSTRUCTION QUALITY ASSURANCE DAILY REPORT

INSPECTION NO.: MIC-111	PAGE 2 OF 2

SUMMARY OF WORK PERFORMED, PROBLEMS AND RESOLUTIONS (CONT'D):

beneath the water line, thrust block and coke building footer could not be removed. Areas where excavation was extremely difficult were surveyed by Sharp's Surveying and sampled for PCB analysis. Five samples were collected in these areas. Two of the five sample possessed results that indicated the samples contained > 50 mg/kg PCBs. These areas will require further excavation by hand.

Visitors: Don Rooney - MIC, Josef Shehabi - MIC

MRP - Mining Residuals Pile

PPA - Plant Process Areas

SIGNED: (CQA INSPECTOR) [illegible] 10/25/99

DESIGN CLARIFICATIONS

Millennium Inorganic Chemicals/ Morrison Knudsen Corporation	Plant 2 $TiCl_4$ Remedial Design/Action

DESIGN CLARIFICATION

DC No.: $TiCl_4$ – 001	Page 1 of 1

Reference Documents (Affected Document No., Revision No., Title):

100% Remedial Design, Drawing 4923-008

Problem / Change Description:

While excavating Plant Process Area "C", an underground retaining wall was encountered on the north side of the excavation that impedes excavation to the design points on the northern portion of Area "C". Please advise.

INITIATED BY	Signature: Donald R. Rooney	Organization: MIC	Date: 07-16-99

Resolution (Use additional sheets if required):

Because the retaining wall extends beyond the required excavation depth of four feet, it is very unlikely that PCB contamination would have migrated north of the wall. Discontinue excavation activities at the limits of the wall and obtain as-built information of the new configuration of the excavation.

APPROVAL BY MK PE	Signature:	Date: 7/20/99	APPROVAL BY U.S. EPA (if necessary)	Signature:	Date:

Additional Reviews: By/Date

Regulator Approval/Notification Recommended:

Yes No **(If approval is recommended, U.S. EPA representative to sign appropriate box)**

cc: J. Shehabi - MIC
D. Rooney - MIC
R. Hughes - MIC
T. VanDonsel – U.S. EPA
J. Kyser - MK
G. Marks – GLC
USEPA Field Representative

Millennium Inorganic Chemicals/ Morrison Knudsen Corporation	Plant 2 $TiCl_4$ Remedial Design/Action

DESIGN CLARIFICATION

DC No.: $TiCl_4$ – 002	Page 1 of 1

Reference Documents (Affected Document No., **Revision** No., Title): Drawing 4923-007

Problem / Change Description: The Grid Excavation Plan shows elevations of 638.49, 634.37, 635.94, 637.03 and 635.06 at the north edge of the concrete pad. The slab elevation varies from 632 to 633, considerably lower than the required excavation depths north of the pad. Does this indicate that a high ridge should be left along the north side of the pad after excavation is complete?

INITIATED BY	Signature: Gene Marks	Organization: GLC	Date: 9-11-99

Resolution (Use additional sheets if required): Although the Grid Excavation Plan only requires excavation to the depths stated above, because this material is in contact with the contaminated stockpiles located on the concrete pad, all material at the north edge of the pad should be excavated down to the level of the pad at a minimum.

APPROVAL BY MK PE	Signature: Jeff Kyser	Date: 9/13/99	APPROVAL BY U.S. EPA (if necessary)	Signature: N/A	Date:

Additional Reviews: By/Date

Regulator Approval/Notification Recommended:

Yes No **(If approval is recommended, U.S. EPA representative to sign appropriate box)**

cc: J. Shehabi - MIC
D. Rooney - MIC
R. Hughes - MIC
T. VanDonsel – U.S. EPA
J. Kyser - MK
G. Marks – GLC
USEPA Field Representative

PROBLEM IDENTIFICATION REPORTS

JK 8/4/99

MILLENNIUM INORGANIC CHEMICALS
PLANT 2 TiCl4 FACILITY
REMEDIAL ACTION
PROBLEM IDENTIFICATION REPORT (PIR)

PIR Number: PIR-001	Date: 8/3/99
Person Contacted: Don Rooney	Date: 8/3/99

Discrepancy (Include Specific Requirement(s) Violated):

Drawing 4923-004, Erosion Control Plan: The drawing calls for the silt fence trench to be backfilled with stone. There is approximately 150' of silt fence on the northwest portion of the site that was backfilled with soil in lieu of stone (see attached figure). Had any rainfall events occurred when contaminated material was exposed in this area (8/2/99 through 8/3/99), it could have resulted in the spread of contaminants off of Millennium's property. Excavation is now complete in this area and no rainfall occurred during the time this material was exposed, therefore there is no potential for the spread of contamination, however the silt fence remains unacceptable even for the collection of non-contaminated silt.

Originator: Jeff Kyser CQA	Response Due Date: ASAP

Recommended Corrective Action:

Prior to the next rain event, install hay bales along the area where the silt fence has been backfilled with soil. This will assist in containing non-contaminated silt.

Measures Implemented to Prevent Recurrence:

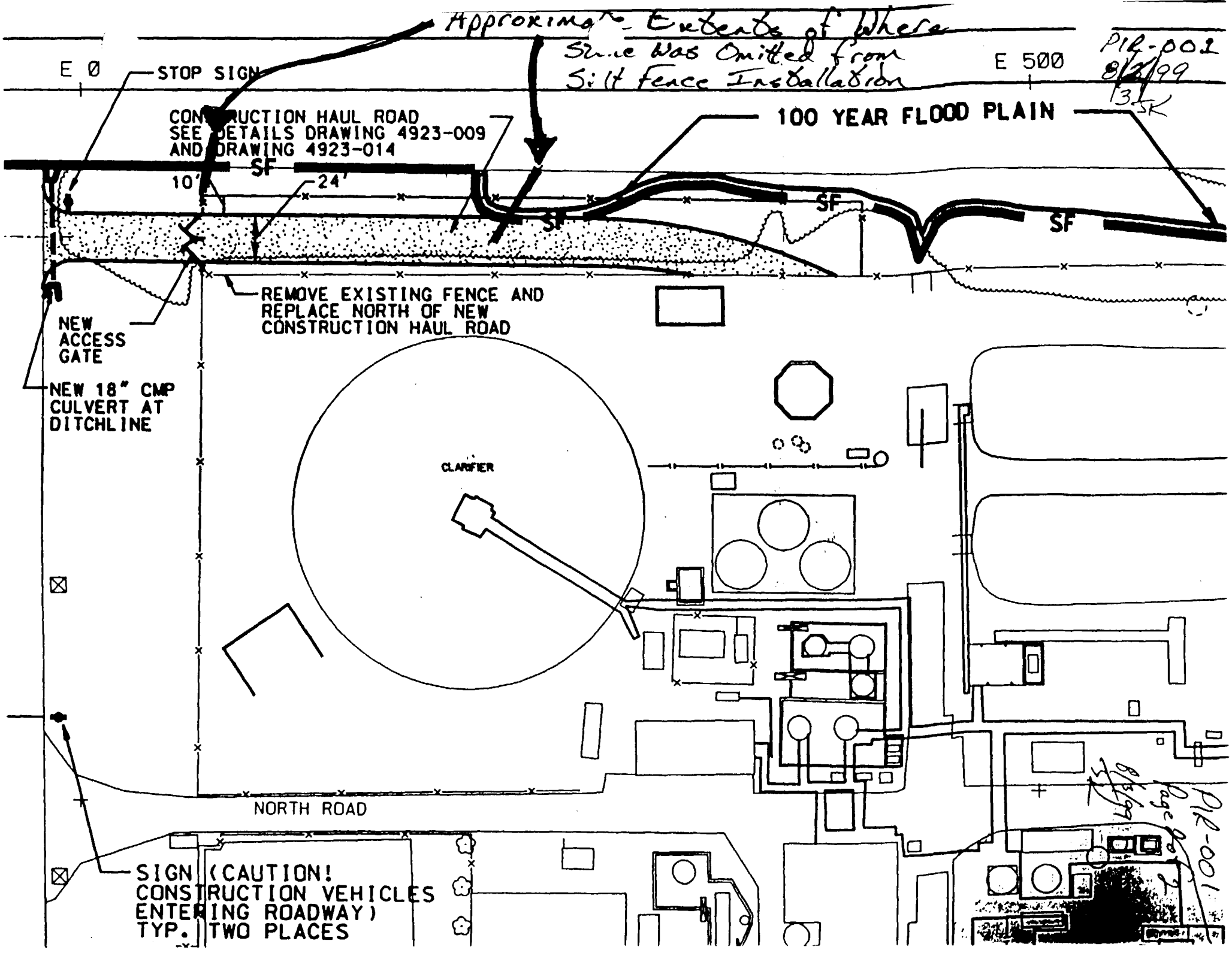
Consult drawings and CQA personnel when deviations from drawings or specification may need consideration.

Corrective Action Taken By (signature and title): Gene Morlas Supt. GHC	Date When Corrective Action Will be Completed: 8-4-99

Corrective Action Verified:

Soil backfill was removed and replaced with stone as per Drawing 4923-004

Corrective Action Verified By: CQA	Date: 8/4/99


Approximate Extents of Where Stone Was Omitted from Silt Fence Installation
PIR-001
8/2/99
3 SK
E 0
STOP SIGN
E 500
CONSTRUCTION HAUL ROAD
SEE DETAILS DRAWING 4923-009
AND DRAWING 4923-014
100 YEAR FLOOD PLAIN
SF
10'
24'
REMOVE EXISTING FENCE AND
REPLACE NORTH OF NEW
CONSTRUCTION HAUL ROAD
NEW
ACCESS
GATE
NEW 18" CMP
CULVERT AT
DITCHLINE
CLARIFIER
NORTH ROAD
SIGN (CAUTION!
CONSTRUCTION VEHICLES
ENTERING ROADWAY)
TYP. TWO PLACES
PIR-001
Page 2 of 2
8/3/99
SK

MILLENNIUM INORGANIC CHEMICALS
PLANT 2 TiCl4 FACILITY
REMEDIAL ACTION
PROBLEM IDENTIFICATION REPORT (PIR)

PIR Number: PIR-002	Date: 9/2/99
Person Contacted: Gene Marks	Date: 9/2/99

Discrepancy (Include Specific Requirement(s) Violated):

RA Work Plan, Page 4-7, Section 4.4.3: While conducting an inspection to eliminate trailer liners in waste hauling vehicles during dry conditions, it was discovered that several trailers either lacked, or contained inadequate gaskets to assist in the prevention of leakage (see attached Trailer Inspection). While no leakage has been identified to date, the risk of leakage is significantly increased with faulty gaskets.

Originator: Jeff Kyser ML/CQA	Response Due Date: ASAP

Recommended Corrective Action:

Remove defective trailers from service until gaskets that seal adequately can be installed.

Measures Implemented to Prevent Recurrence:

GLC must receive written approval prior to the utilization of new waste hauling trailers (see Attachment 1). All new trailers to be put into service may only be approved by CQA or authorized MIC representative. Effective immediately, after each shipment of waste material has been dumped, the waste hauling trailer must be inspected by a GLC representative per the newly revised truck lining procedures (see Attachment 2).

Corrective Action Taken By (signature and title): Gene Marks (Supt.)	Date When Corrective Action Will be Completed: 9-3-99

Corrective Action Verified:

All trailers have been adequately repaired and inspected. Inspections are currently ongoing and will continue for the remainder of the Remedial Action.

Corrective Action Verified By: Jeff Kyser ML/CQA	Date: 9/16/99

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2 of 6
9/16/99
SK

9-2-99

Trailer Inspection
Per Army Corp. of Engineers

TRAILER NO.	LICENSE NO.	RESULT
79 T	TLE 4371	Repair bottom seal
81	TLE 4370	Replace bottom seal
54	TLA 7695	No seal in the bottom; a piece is missing; Parked at 1:50 p.m.
123 T	TLE 4422	Passed test; O.K to load without plastic liner
37 T	TLA 7689	Worn gasket needs replaced; bottom right needs straightened
84 T	TLE 4367	Replace worn gasket; straighten flanges and taper on the right side.
339	TLA 4864	No Seal; Parked at 1:25 p.m.
943	T91WQ	O.K. for now but needs seal right away.

PIL-002
3 of 6
9/16/99
JK

101 T	TLE 4351	Passed test. O.K. to load without plastic liner.
88 T	TLE 4366	No Seal in the bottom. Parked at 2:15 p.m.
48 T	TLA 7680	O.K. for now but will need one in the near futureO.K. to load without plastic liner.

PIL-002
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9/16/99

Attachment 1

Request to Utilize Trailer

GLC would like to utilize a new trailer for waste hauling. The trailer has been inspected and deemed suitable for hauling waste material. The trailer will continue to be inspected in accordance with the Revised Trailer Lining Procedures, dated September 3, 1999.

Date:_____

Trailer License Plate No.:_____

GLC Representative: _____

Acceptable For Use (CQA or authorized MIC representative):_____

PIR-002
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9/16/99
SK

Attachment 2

As a result of PIR-002, additional revisions are required to the Revised Trailer Lining Procedure, submitted to USEPA on August 20, 1999. Additional revisions are in bold and are effective September 3, 1999.

Revised Trailer Lining Procedures

After hauling approximately 1000 loads of contaminated material from the MRP to MIC's landfill, the RA project personnel have determined that a revised approach to trailer lining procedures will remove several health and safety concerns, reduce a waste stream, and improve production without compromising leakage concerns during hauling activities. With USEPA's approval, MIC will implement the following new truck lining procedures for wet and dry conditions:

Regardless of wet or dry conditions all trailers will receive a visual inspection, after they have been dumped, that includes an evaulation of the tailgate seal on that trailer. The tailgate seal evaulation will be performed while the tailgate remains open and will confirm that:

- **Each tailgate will possess a gasket that is fully intact.**
- **The gasket is able to provide an adequate seal that prevents any material leakage.**
- **The gasket and tailgate contact area are freed of dirt or other debris that may prevent an adequate seal between the tailgate and the trailer bed.**

All trailers that do not possess a proper seal shall be removed from service immediately. Trailers removed from service will not be permitted to haul waste material again until approved for such by CQA or an authorized MIC representative.

Dry Conditions

- In dry conditions, truck liners may be eliminated.
- Trucks will continue to be loaded, inspected, radiologically surveyed and manifested prior to their release to the landfill. As always, under no circumstances will trailers with suspected leakage or external contamination be released to the MIC landfill until the problem has been properly corrected to the satisfaction of the manifestor.
- Trucks will proceed to the landfill and follow dump procedures as they currently do. After dumping, a visual inspection will be performed to ensure that all material has been eliminated from the trailer bed. Trailers containing significant residual material will be sent back to the MRP where they will be cleaned manually or by machine, whichever is more appropriate. With a brief inspection after each dump, it can be assured that continuous buildup of material will not become an issue.
- Having cleaned the trailer of residual material, the truck will resume its normal hauling routine (i.e. loaded, inspected, rad surveyed and manifested).
- At the end of each work day, all trailers will be will be shoveled and swept clean.

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9/16/99
JR

Wet Conditions

- As always, no work will be performed in periods of heavy precipitation.
- In conditions of light rain, or the MRP material becomes wet, plastic liners will be installed in each trailer in a manner consistent with current lining procedures.

MIC TRAILER RELEASE FORMS

M.I.C. Release Form For Trailer Repair

Trailer Number. 81-T

Date: Out of service. 8-9-99

Date: In service. 8-10-99

Trailer seal tag number. 09873, 09810

Brief description of work to be performed.

Complete Service & BRAKE Reline on 4 axles

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 17:05 Date 8/9/99

Dart Representative [signature] ABB Express Inc. Time 6 15 Am Date 8/10/99

M.I.C. Release Form For Trailer Repair

Trailer Number. 37T

Date: Out of service. Aug. 10, 1999

Date: In service.

Trailer seal tag number. 09860, 09853, 09874, 09804

Brief description of work to be performed.

Replace fifth wheel and trailer inspection

REMOVED SEALS 8-11-99 0705 gfh

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:27 Date 08-10-99

Dart Representative [signature] ABBA Express Time 6:30 Date 8-11-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 943

Date: Out of service. 8-11-99

Date: In service. 8-12-99

Trailer seal tag number. 0954 & 0956

Brief description of work to be performed.

Work on Scope (Leaking Fluid)

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 1702 Date 08-11-99

Dart Representative [signature] ABBA Express Time 6 30 AM Date 8-12-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 943

Date: Out of service. 8 12 99

Date: In service. 8/13/99

Trailer seal tag number. 09852 & 09863

Brief description of work to be performed.

Work on Scope (Leaking Fluid)

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 17:05 Date 8/12/99

Dart Representative [signature] ABBA Express Time 6:30 Am Date 8/13/99

M.I.C. Release Form For Trailer Repair

Trailer Number. 81T

Date: Out of service. 8-19-99

Date: In service. ~~[illegible]~~

Trailer seal tag number. 81T 09823 / 101T 09876

Brief description of work to be performed.

81T { fix or replace broken Parts on trap.
the trap will not have to be Rolled to be fix.

REPAIR HYD. LEAK @ SCOPE 101T

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative Donald R Rooney Time 15:30 Date 08/19/99

Dart Representative [illegible] Time 7:00 Date 8/20/99

81T SEAL 09823

SEAL 09876 TO BE USED ON TRAILER 101T

M.I.C. Release Form For Trailer Repair

Trailer Number. 123T

Date: Out of service. 8-23-99

Date: In service. 8-24-99

Trailer seal tag number. 09855

Brief description of work to be performed.

ROLL TARP TUBING IS BROKEN

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:00 Date 8-23-99

Dart Representative [signature] ABBA Express Time 6:30 AM Date 8-24-99.

SR M.P. Tech DAVID EATON 8-23-99 1610HR
gross maslin wipe inside Trailer = < 2xBkgd
LAW wipe with maslin outside Trailer = < 2xBkgd
All Readings < 200 dpm

M.I.C. Release Form For Trailer Repair

Trailer Number. T101

Date: Out of service. 8-24

Date: In service.

Trailer seal tag number. 09867

Brief description of work to be performed.

2 side boards to replace

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:30 Date 8-24-99

Dart Representative [signature] Time [illegible] Date [illegible]

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339

Date: Out of service. 8-24-99

Date: In service. 8-24-99

Trailer seal tag number. 9879, 9825, 9877, 9808

Brief description of work to be performed.

Change hydrolic line and clean up.

SEAL REMOVED 8-24-99 @ 1240

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 10:20 Date 08-24-99

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

Dart Representative [signature] Time 12:15 pm Date 8-24-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 81T

Date: Out of service. 8-24-99

Date: In service. 8-25-99

Trailer seal tag number. ~~[illegible]~~ 09885

Brief description of work to be performed.

to fix the Rod in the tarp.

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:30 Date 08-24-99

Dart Representative DB ABBA Express Inc Time 7:00 am Date 8-25-99

M.I.C. Release Form For Trailer Repair

Trailer Number. T101

Date: Out of service. 8-24

Date: In service. 8-25-99

Trailer seal tag number. 09867

Brief description of work to be performed.

2 side boards to replace

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:30 Date 8-24-99

Dart Representative [signature] Time ~~[illegible]~~ Date ~~[illegible]~~

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

ABBA Express Inc 7:00 AM 8-25-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 84T

Date: Out of service. August 24, 1999

Date: In service. 8-25-99

Trailer seal tag number. 09859

Brief description of work to be performed.

REPLACE SIDE BOARDS

FIX FRONT STRAP TORE LOOSE FROM TARP

WINDER WON'T TIGHTEN UP

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 16:50 Date 08-24-99

Dart Representative [signature] Time 5:00 pm Date 8-24-99

ABBA Express Inc. 7:00 AM 8-25-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339

Date: Out of service. 8-25-99

Date: In service. 8-25-99.

Trailer seal tag number. 09864, 09820, 09865, 09851

Brief description of work to be performed.

To be serviced.

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative Donald R Rooney Time 08:30 Date 08-24-99

Dart Representative [signature] Abba Express, Inc. 6209 Rt. 193 Kingsville, Oh. 44048 Time 1:15 pm Date 8-25-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 943

Date: Out of service. 8-25-99

Date: In service. 8-25-99

Trailer seal tag number. 09803, 09863

Brief description of work to be performed.

Service Work

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 08:30 Date 08-24-99

Dart Representative [signature] Time 1:30 pm Date 8-25-99

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. 37T

Date: Out of service. 8-25-99

Date: In service. 8-25 99

Trailer seal tag number. 09884, 09824

Brief description of work to be performed.

Service work

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative Donald R Rooney Time 08:30 Date 08-25

Dart Representative [signature] Time 1:30 pm Date 8-25

Abba Express, Inc.
6809 Rt 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339 License Plate # TLA 4864

Date: Out of service. 9/9/99

Date: In service. 9/10/99

Trailer seal tag number. N/A. Tailgate must be opened for repair

Brief description of work to be performed.

Repair warped tailgate.

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 1800 Date 9/9/99

Dart Representative [signature] Time 7:20 Date 9-10-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 943 Licence Plate # T91WQ

Date: Out of service. 9/13/99

Date: In service. 9-14-99

Trailer seal tag number. 09827, 09880

Brief description of work to be performed.

Repair trailer lights

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 0945 Date 9/15/99

Dart Representative [signature] Time 7:00 Date 9/16/99

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339 TLA 4864

Date: Out of service. 9-20-99

Date: In service. 09875 – 09822 – 09841

Trailer seal tag number. 09829

Brief description of work to be performed.

Tarp Roll up tube needs replaced

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative _____ Time 10:40 Date 9/20/99

Dart Representative _____ Time _____ Date 9/21/99

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. 37T- TLA-7689

Date: Out of service. 9-21

Date: In service. 9-22-99

Trailer seal tag number. 09834- 09881, 09833-09840

Brief description of work to be performed.

Change Tires

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative _____ Time 17:15 Date 9/21/99

Dart Representative _____ Time 6 30 Am. Date 9/22/99

Ruda Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. T91WQ 943

Date: Out of service. 9-24-99

Date: In service. 9-25-99

Trailer seal tag number. 09883 - 09870 - ~~[illegible]~~

Brief description of work to be performed.

Replace Torque Bushings

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 1645 Date 9/24/99

Dart Representative [signature] ABBA Express Time 6 30 am Date 9-25-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 37-T

Date: Out of service. 9-28-99

Date: In service. 9-30-99

Trailer seal tag number. 09837, 09869

Brief description of work to be performed.

Replace 12. Tire. Weld Safety Winder.

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 08:50 Date 09-28-99

Dart Representative [signature] Abba Express, Inc. 6209 Rt. 193 Kingsville, Oh. 44048 Time 6:30 AM Date 9-30-99

M.I.C. Release Form For Trailer Repair

Trailer Number. 99T

Date: Out of service. 9-29-99

Date: In service. 9-30-99

Trailer seal tag number. 09835

Brief description of work to be performed.

Pole ~~[illegible]~~ TO ~~[illegible]~~ Role TARP needs fix

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 0905 Date 09-29-99

Dart Representative [signature] Time 6:30 am Date 9-30-99

~~Abba Express, Inc.~~
6209 Rt. 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339

Date: Out of service. 9-29-99

Date: In service. 9-30-99

Trailer seal tag number. 09871 09882 - 09844 - 09890

Brief description of work to be performed.

Winder broken Off, Need to be repaired

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative Donald R Rooney Time 09:05 Date 09-29-99

Dart Representative DB Time 6:30 Am Date 9-30-99

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

M.I.C. Release Form For Trailer Repair

Trailer Number. 0339

Date: Out of service. 10-1-99

Date: In service. 10-2 99

Trailer seal tag number. 09845, 09848, 09858, 09838

Brief description of work to be performed.

weld brackets for top boards

- Trailer parts need to be ordered and at service site before the trailer leaves the M.I.C. Landfill.
- M.I.C. representative will sign form before trailer is allowed to leave for service.
- Dart representative must sign form and include date and time of release of equipment back to M.I.C. Landfill or M.I.C. job site.
- Trailers must be empty, swept clean inside and out with a verified visual inspection. A Radiological wipe test must be performed inside and outsides. However a PCB wipe will not be necessary at this time for trailer repair.
- P.P.E. to be worn while servicing equipment will include gloves, dust mask and boots.
- **Trailers will not be used for any other loads whatsoever while at the service center!**

M.I.C. Representative [signature] Time 14:30 Date 10/1/99

Dart Representative [signature] Time 6:30 pm Date 10/2/99

Abba Express, Inc.
6209 Rt. 193
Kingsville, Oh. 44048

APPENDIX E
RADIOLOGICAL SURVEYS

APPENDIX E
RADIOLOGICAL SURVEYS

TABLE OF CONTENTS

TITLE	NO. OF PAGES
GRID WALKOVER SURVEYS	252 pages

MRP Remediation
Confirmation Grid Survey Summary Report
for
Work Week 7/26/99 – 7/30/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results** (pCi/g:Ra-226&Ra-228)	**Comment**
1 South	7/26/99	<2 X Bkg		
2 East	7/26/99	<2 X Bkg	1.6	
2 West	7/26/99		3.2	
7	7/29/99	<2 X Bkg	2.5	
6 North	7/29/99	<2 X Bkg	2.1	
5 South	7/29/99	<2 X Bkg	1.6	
6 South	7/30/99	<2 X Bkg	2.3	
8 North	7/30/99	<2 X Bkg	2.7	
8 South	7/30/99	<2 X Bkg	2.6	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228).

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

.E: MILLENIUM	DATE: Yr 99 Mo 7 Dy 26	Time: 0930	Page 1 of 1
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

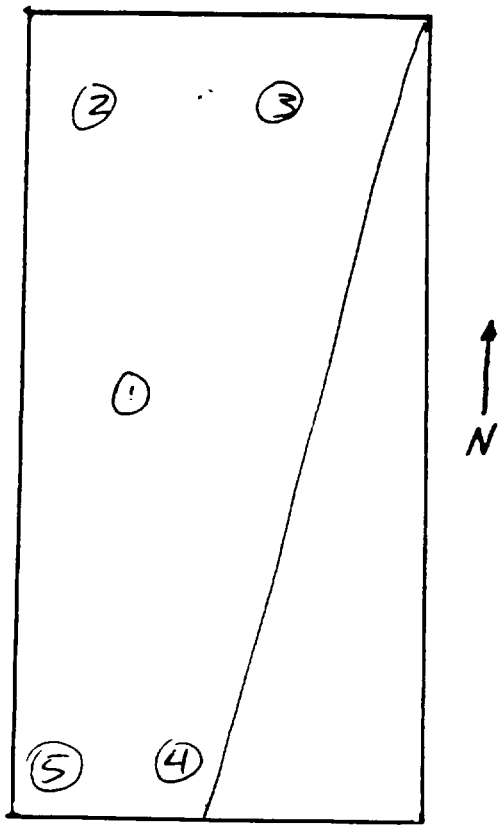
LOCATION: Grid 1 South Confirmation Survey

Bicron analyst #
" G-5 #

Cal. Due

SKETCH:

Bkgd	11,000	cpm
walkover	9-12,000	cpm
# 1	12,365	cpm
# 2	9,900	cpm
# 3	8,129	cpm
4	9,602	cpm
# 5	11,234	cpm



REMARKS: Reproduced from field notes.

.EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeuenberg Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 26	Time: 1000	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

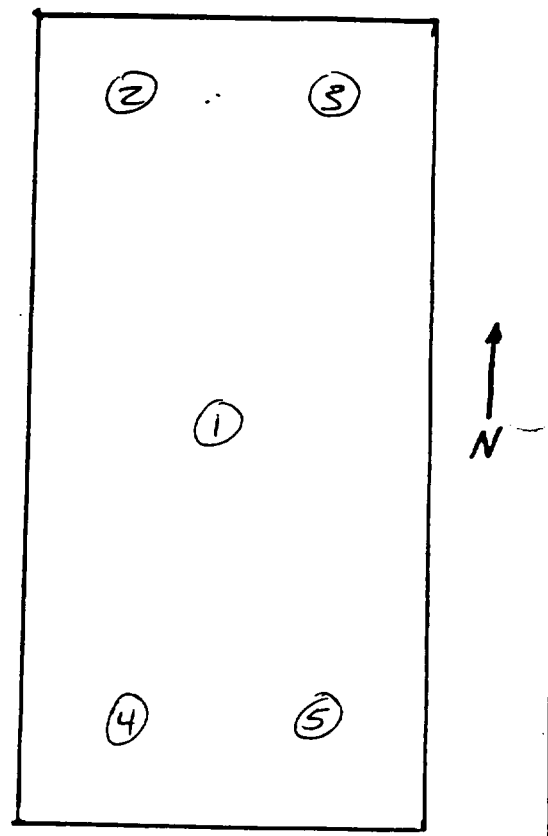
LOCATION: Grid 2 East Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	11,000 cpm
walkover	12-18,000 cpm
# 1	11,913 cpm
# 2	11,716 cpm
# 3	11,744 cpm
# 4	9,849 cpm
# 5	12,192 cpm



REMARKS: Reproduced from field notes.
Sample ID # 990726602
All readings < 2 times BKg

.VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Ilsenberg

Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

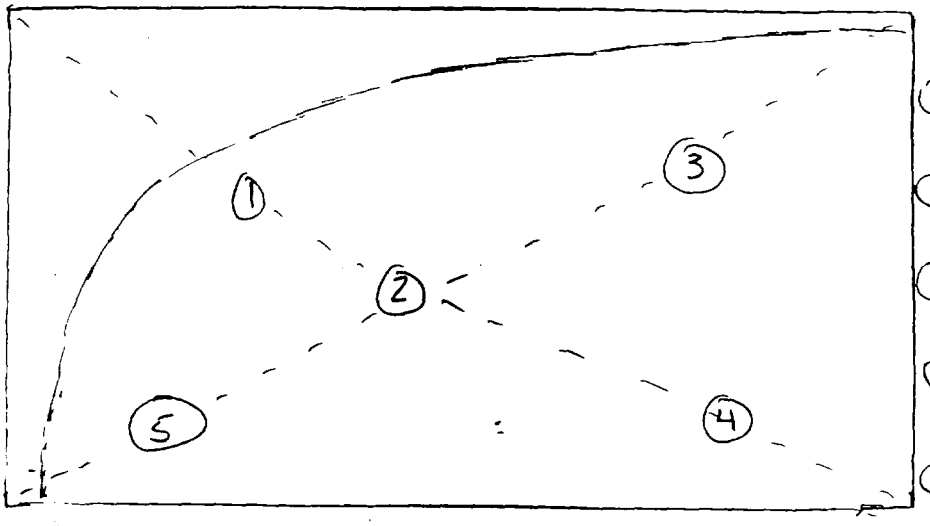
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 29	Time: 1330	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Sample grid 5 South

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE LOCATION~~ ~~DRJ~~ Sample location 7/29/99 ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler ser # A2282 cal due 5/14/00
BKG 10,000 ~~15,000~~ -12,000 cpm ~~DRJ~~ 8/4/99



	Fiddler Reading (cpm)
1	23000
2	16654
3	18125
4	17240
5	19785

Avg. of 5: 94804 ÷ 5 = 18961

Radium concentration ~~from~~ 2.1 pCi/g DRJ 7/29/99

Per telephone call from RMIES

REMARKS: SCAN OF ENTIRE AREA. ALL MEASUREMENTS LESS THAN TWICE BKGD.
Sample ID # 990729601
BKG is the average of the 5 contact readings (i.e., 18961) ~~DRJ~~ 7/29/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: R Zenenberger Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 29	Time: 1330	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Sample grid 6 North

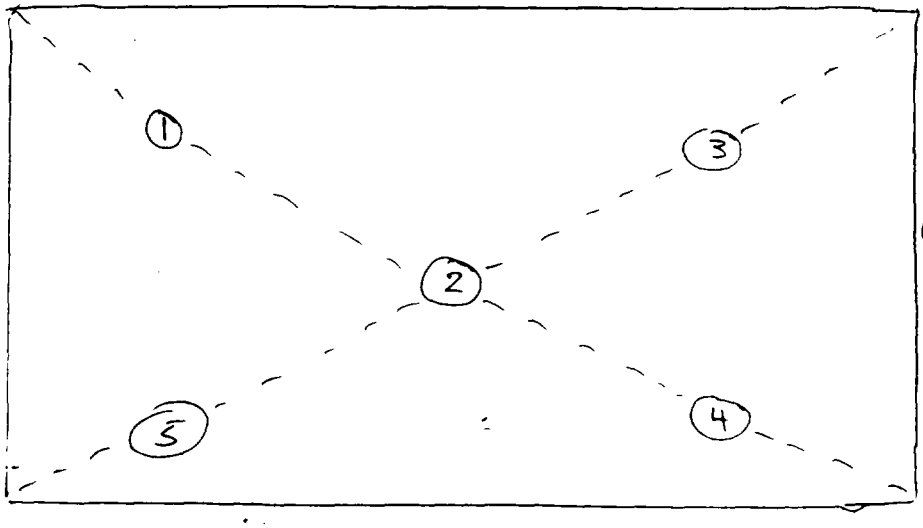
MAP KEY: O = ~~SMEAR / LARGE AREA WIPE LOCATION~~ Sample Location ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler ser# A2282 cal due 5/14/00

BKG 10,000 cpm - 12,000 cpm

DRS 8/4/99

N



Fiddler Readings (cpm)	
1	19240
2	19594
3	16967
4	18199
5	20750
	94750
Avg. of 5	÷ 5
	18950

Radium concentration 3.5 pCi/g

per telephone call from RMIES

REMARKS: SCAN OF ENTIRE AREA. ALL MEASUREMENTS LESS THAN TWICE PER BKGD.
BKG is the average of the 5 contact readings (i.e., 18950) [illegible]
Sample ID # 990729602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 8/4/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

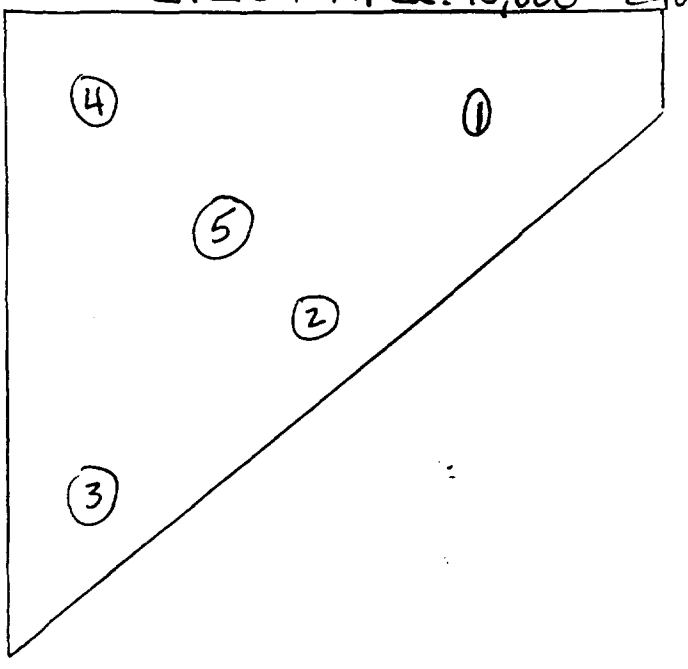
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 29	Time: 1600	Page 1 of 2
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 7 (exclusion area - bisects) North West

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler Cal due: 5/14/00
Ser #: ~~B~~ DRJ A2282 BKg: 11,000
G-5 # B-588M
General Area: 15,000 - 29000 cpm



Fiddler Readings

1	17102
2	15225
3	15399
4	14261
5	15995
	77962
	÷ 5
avg	15592

REMARKS: BKG = Average of 5 stationary measurements. All readings < 2 times BKG. RZ 8/7/99
Sample ID # 990729603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Zamberg Date: 8/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

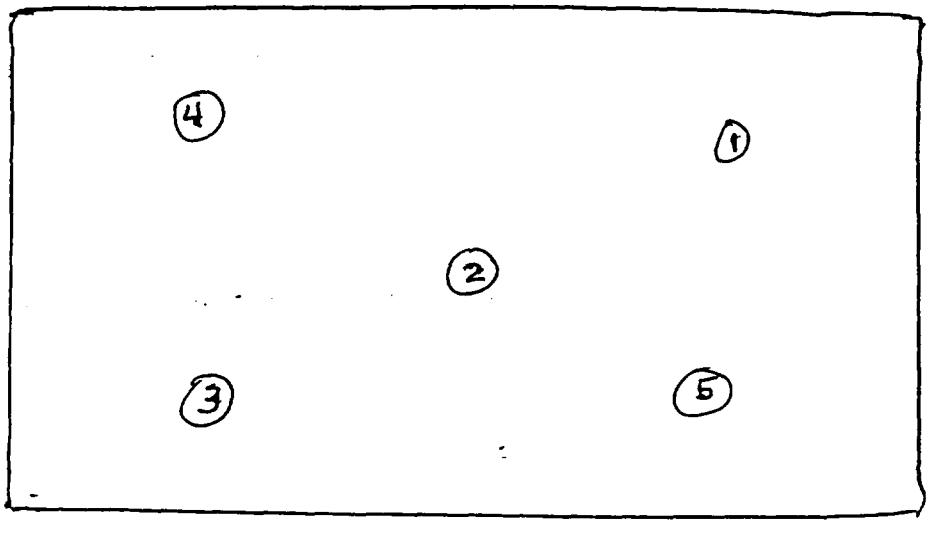
SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 30	Time: 1615	Page 1 of 2
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 8 South

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler cal due: 5-14-99
Ser. # A2282 Bkg: 11,000 cpm
G-S # B588M

General area 15,000 - 20,000 ~~d~~ cpm



N

Fiddler Readings

1	16,299
2	17,284
3	15,011
4	19,800
5	15,008
	83,402
	÷ 5
Avg.	16,680

REMARKS: Page 2 is a copy of the results of a 15 minute "quick" count of the composite sample. Sample ID # 990730601
BKG = Average of 5 stationary measurements. All readings < 2 times BKG. RZ 8/7/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: K Zemberg Date: 8/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 30	Time: 1624	Page 1 of 2
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 8 North

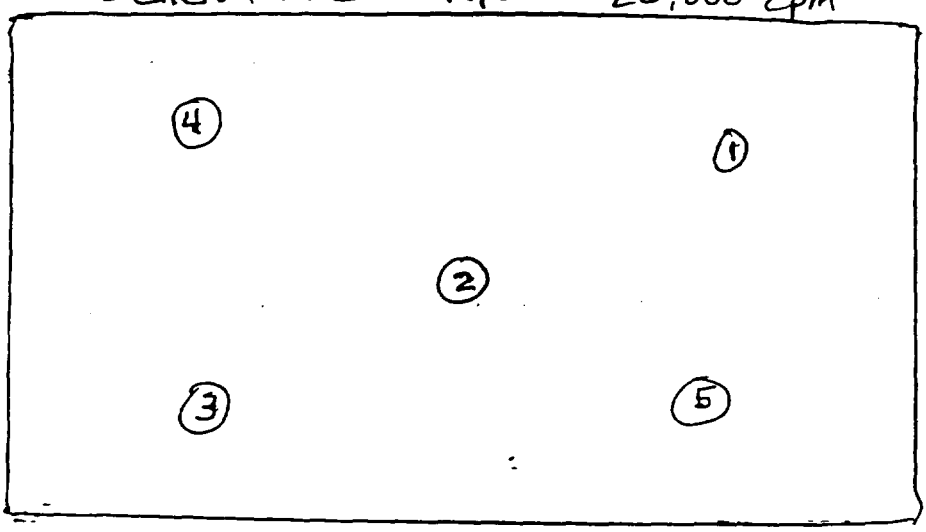
MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler cal due: 5-14-00

Ser. #: A2282 Bkg: 11,000 cpm

G-S # B588M

General Area: 18,000 - 25,000 cpm



Fiddler Readings

1	19 366
2	21 104
3	15 282
4	19 664
5	15 179
	90 595
	÷ 5
Avg.	18119

REMARKS: Page 2 is a copy of the results of a 15 minute "quick" count of the composite sample. Sample ID # 990730602
BKG = Average of 5 stationary measurements. All readings < 2 times BKG. RZ 8/3/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R. Zemberg Date: 8/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 7 Dy 30	Time: 1634	Page 1 of 2
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 6 South

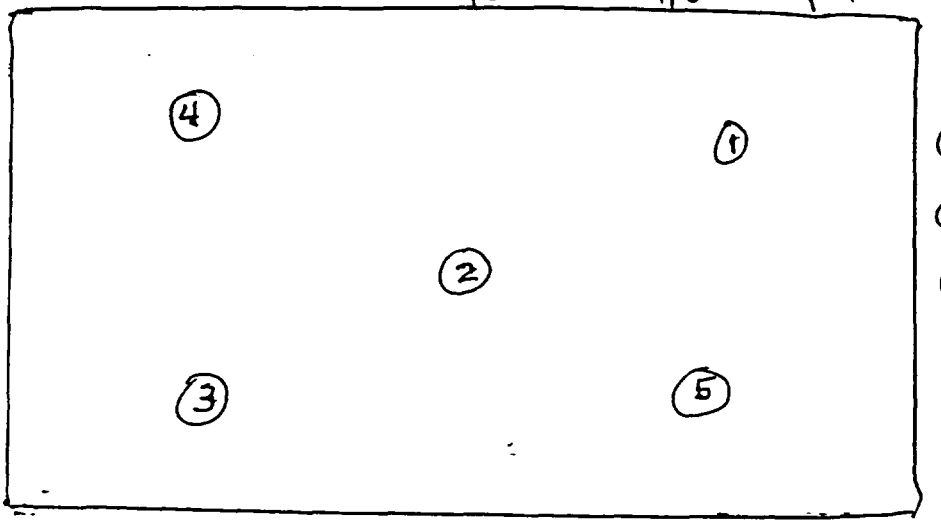
MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

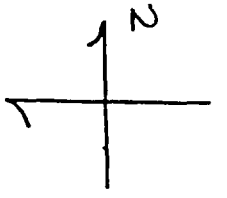
SKETCH: Bicron Fiddler cal due: 5-14-99

Ser. #: A228Z Bkg: 11,000 cpm

G-5 # B588M

General Area: 16,000 - 24,000 cpm





Fiddler Readings

1. 15 180
2. 17045
3. 19999
4. 19036
5. 18538

89798
÷ 5
17960
Avg.

REMARKS: Page 2 is a copy of the results of a 15 minute "quick" count of the composite sample. Sample ID # 990729602
Background = Average of 5 stationary measurements R2
All readings < 2 times BKG. 8/7/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Lemberg Date: 8/6/99

MRP Remediation
Confirmation Grid Survey Summary Report
for
Week Beginning 8/2/99 – 8/7/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
125	8/2/99	<2 X Bkg	NA[3]	
132	8/2/99	<2 X Bkg	NA[3]	Hot Spot was detected and Remediated.
3 West	8/3/99	<2 X Bkg	2.3	
5 North	8/3/99	<2 X Bkg	1.9	
126 West	8/3/99	<2 X Bkg	NA[3]	
27 SE	8/4/99	<2 X Bkg	2.3	
26 North	8/4/99	<2 X Bkg	2.1	
126 East	8/4/99	<2 X Bkg	NA[3]	
124	8/4/99	<2 X Bkg	NA[3]	
38 South	8/4/99	<2 X Bkg	1.9	
9 North	8/6/99	<2 X Bkg	2.3	
26 South	8/6/99	<2 X Bkg	1.9	
10 North	8/7/99	<2 X Bkg	2.3	
11 North	8/7/99	<2 X Bkg	1.9	
9 South	8/7/99	<2 X Bkg	2.6	
12 South	8/7/99	<2 X Bkg	2.1	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228).
3) Sample not required per work plan.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 2	Time: 1730	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 125 (50'x50')

MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:

N

General Area readings - 12,000 - 20,000 cpm

Bicron Fiddler ser# A2282 cal due 5/14/00 BKG 12,000 cpm

REMARKS: Fiddler survey only per J. Kyser.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

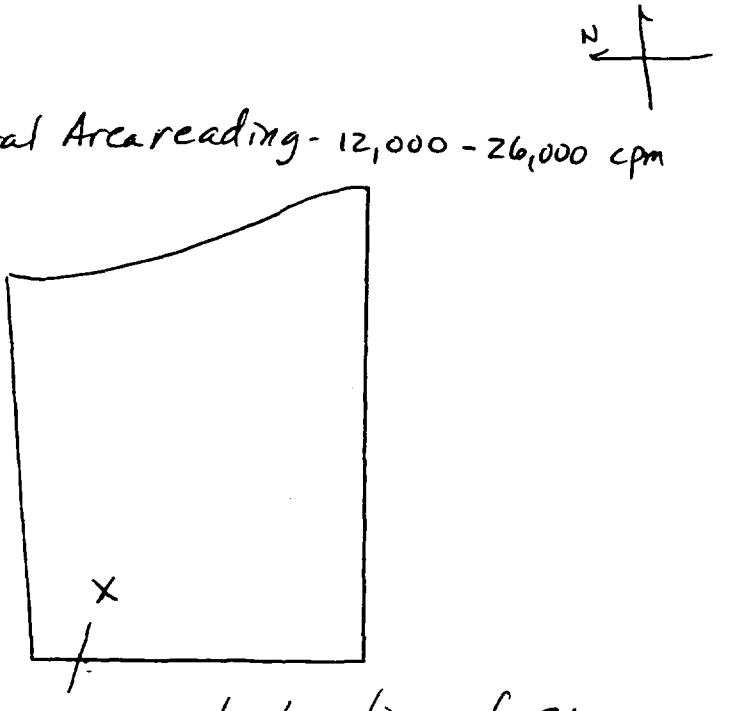
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 2	Time: 1730	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 132 (section within exclusion area) (see Master Grid map)

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Bicron Fiddler ser# A2282 cal due 5/14/00 BKG 12,000 cpm

REMARKS: Fiddler survey only per J. Kyser.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeusenberger Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 03	Time: 1450 42	Page 1 of 1
RWP No. 003	WORK ORDER No.	BLDG. No.	

SPECIFIC ITEMS OF SURVEY: 3 west

PURPOSE OF SURVEY: walkover & direct beta gamma of sample points

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
A2282	5/14/00	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☒ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☒ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
	GRID 3 west, walk over		16-24 K			MAP on Reverse
	GRID 3 west sample #1		15,298			
	#2		19,145			
	#3		17,939			
	#4		15,538			
	#5		16,374			

REMARKS: BKG = Average of 5 stationary measurements (i.e. 16,858 cpm)
All measurements < 2 times BKG. R2 8/7/99
Sample ID # 990803601

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: K Zwenhen Date: 8/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 03	Time: 1530 HR	Page 1 of 1
RWP No. 003	WORK ORDER No.	BLDG. No.	

SPECIFIC ITEMS OF SURVEY: 5-North

PURPOSE OF SURVEY: Walkover + direct beta gamma of Sample Points

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
A 2282	5/14/00	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☑ G-5 ☑ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ ____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☒ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
	Grid 5 North walk over		18.26 K			Map on Reverse
	#1		17,811			
	#2		20,265			
	#3		21,031			
	#4		22,032			
	#5		17,551			

REMARKS: BKG = Average of 5 Stationary measurements = 19,738 cpm.
All measurements < 2 times BKG
Sample ID # 990803602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Tenenbey

Date: 8/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 3	Time: 1750	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 126 West

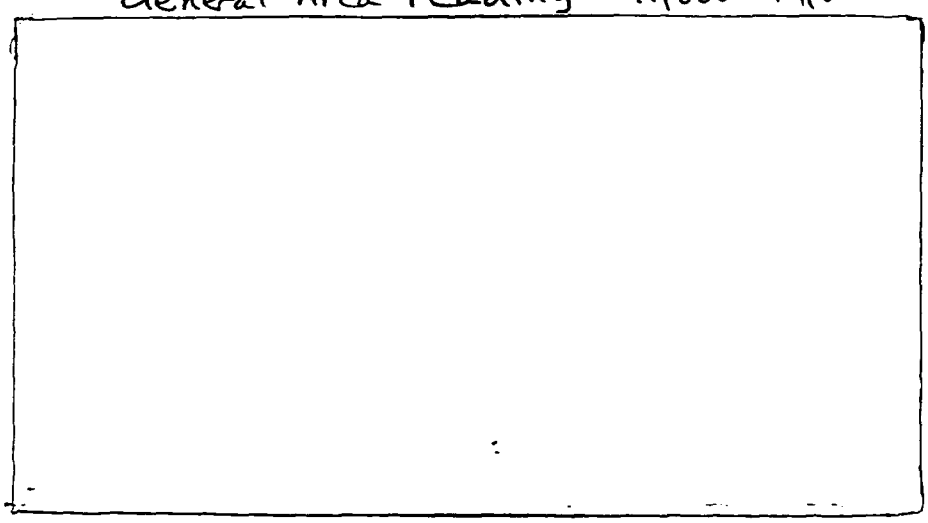
MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:

DRJ 8/4/99

N

General Area reading - 11,000-14,000



BicronFiddler ser# A2282 cal due 5/14/00 BKG 11,000 cpm

REMARKS: Fiddler survey only per J. Kyser.

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

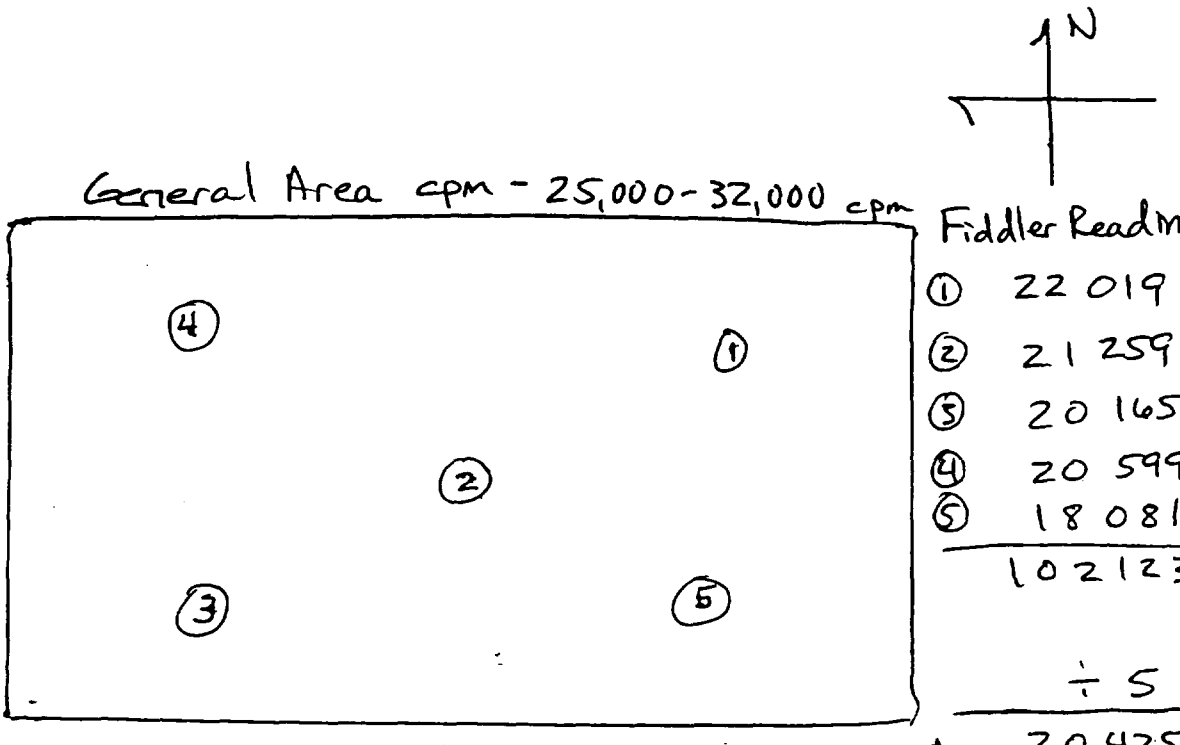
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 0915	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 38 South

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler Readings

1	22019
2	21259
3	20165
4	20599
5	18081
	102123
	÷ 5
Avg	20425

Bicron Fiddler ser# A2282 cal due 5/14/00

BKG taken at HP station by RR tracks.
analog - 10,000 cpm
digital - 9,071 cpm

REMARKS: BKG = average of 5 contact readings (i.e., 20425).
All readings are C2X BKG. R2 8/7/99
Sample ID # 990804601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: R Tenenberger Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 0930	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: Sample/Grid Location 124

PURPOSE OF SURVEY: Walkover survey

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
dler A2282/BSSM	5/14/00	— / —	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☑ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks/Results
1	Grid #124					Fiddler range 12-16,000 cpm
						Fiddler BKG-analog 13,976 cpm 15,000 cpm

REMARKS: ~~Fiddler ser #~~ ORD

'RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

/ / / /

Reviewed by: [signature] Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 1430	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No. MRP	

LOCATION: Grid 27 SE, Confirmation Survey

MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:

Fidler

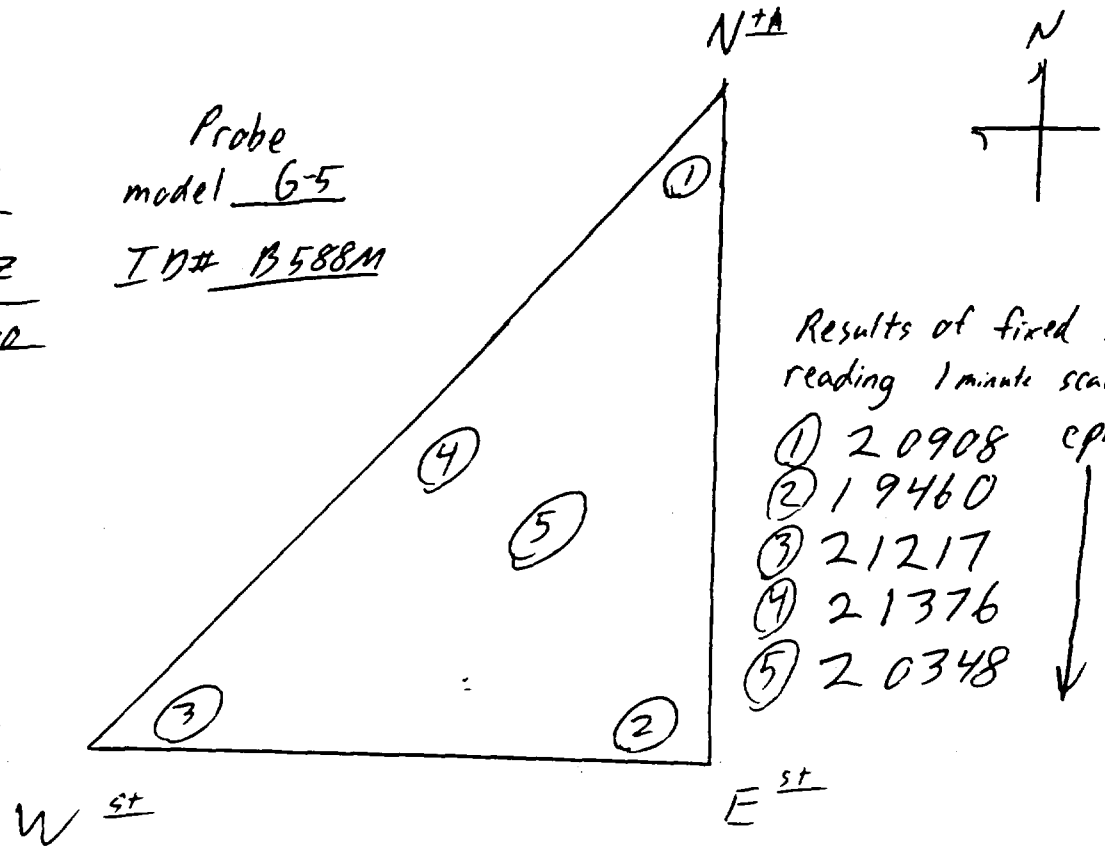
Box model analyst

ID# A228Z

Cal Due 5/14/00

Probe model G-5

ID# B588M



Results of fixed scaler reading 1 minute scaler counts

1. 20908 cpm
2. 19460
3. 21217
4. 21376
5. 20348

Sample ID# 990804602

REMARKS: Scanning results for walkover survey 20,000-30,000 cpm
BKG; measured @ HP access station (log in station) = 10K cpm
All readings < 2 × BKG (measured in Grid)
Average fixed scaler reading = 20662

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Leuenberger / R Leuenberger /

Reviewed by: Dellas R [signature] Date: 8/17/99

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A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 1430	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. NA	
LOCATION: 126 East			

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ Contact Reading RZ 8/4/99 ☐ = AIR SAMPLE LOCATION

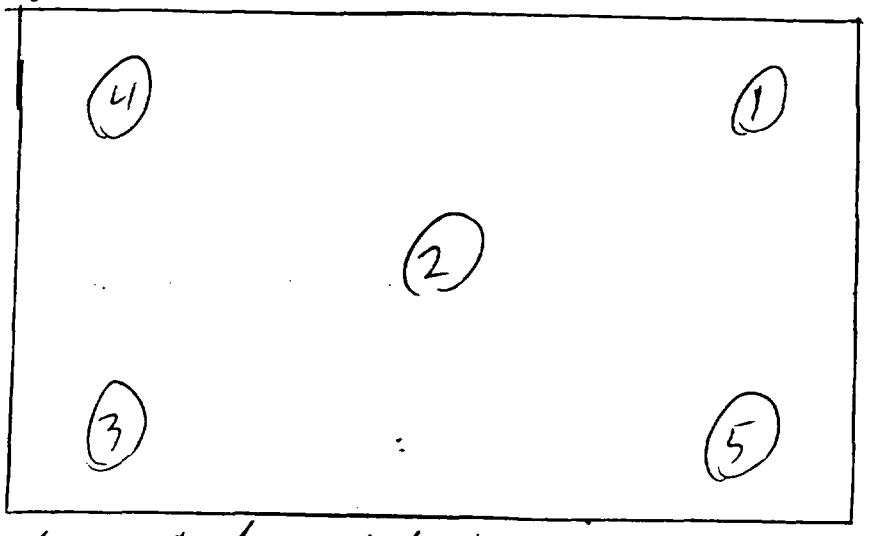
SKETCH:

Fidler
Meter box
Model analyst
ID# A 228Z
Cal Due 5-14-00

Probe
Model G-5
ID# B588M

E st

N



N th

S th

W st

Stationary Readings at designated locations
1 minute scaler measurements
① 15424 cpm
② 12798
③ 10818
④ 12268
⑤ 12660

REMARKS: Results for walk-over scan of area = 12,000 - 15000 cpm
BKG = measured @ HP access station = 15K cpm
Average fixed scaler reading = 12799

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R. Leuenberger R Leuenberger

Reviewed by: Dallas R Jones Date: 8/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 1430	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. NA	

LOCATION: 126 East

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ Contact Reading RZ 8/4/99 ☐ = AIR SAMPLE LOCATION

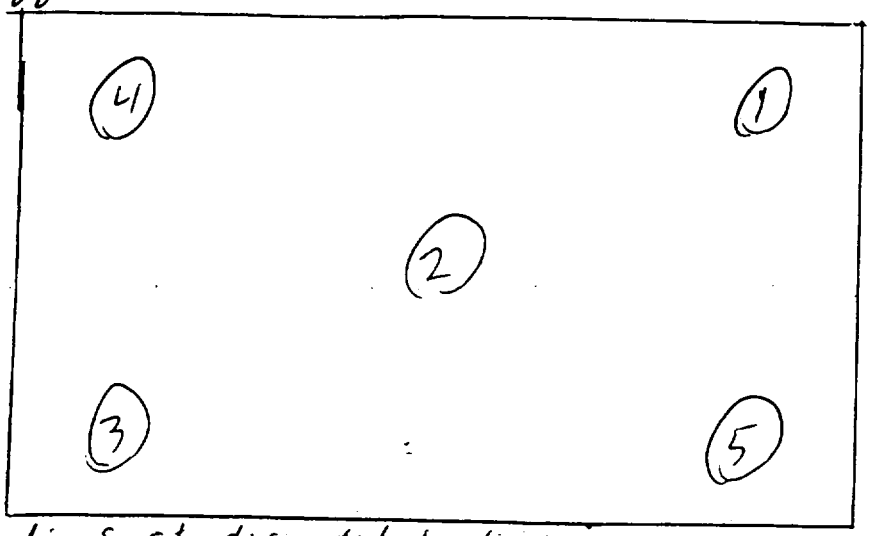
SKETCH:

Meter box
Model Lud 2221
ID# 157018
Cal Due 7/14/00

Probe
Model 44-10
ID# PR 163158

E st

N



N th

S th

W st

Stationary Readings at designated locations
1 minute scaler measurements

1. 4241 cpm
2. 3458
3. 2774
4. 3333
5. 3518

REMARKS: Results for walk-over scan of area = 2,500-4,000 cpm
BKG = 2,000 cpm
Average fixed scaler reading = 3465

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Leuenberger R Leuenberger

Reviewed by: Dallas R Jones Date: 8/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 4	Time: 1445	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No. MRP	

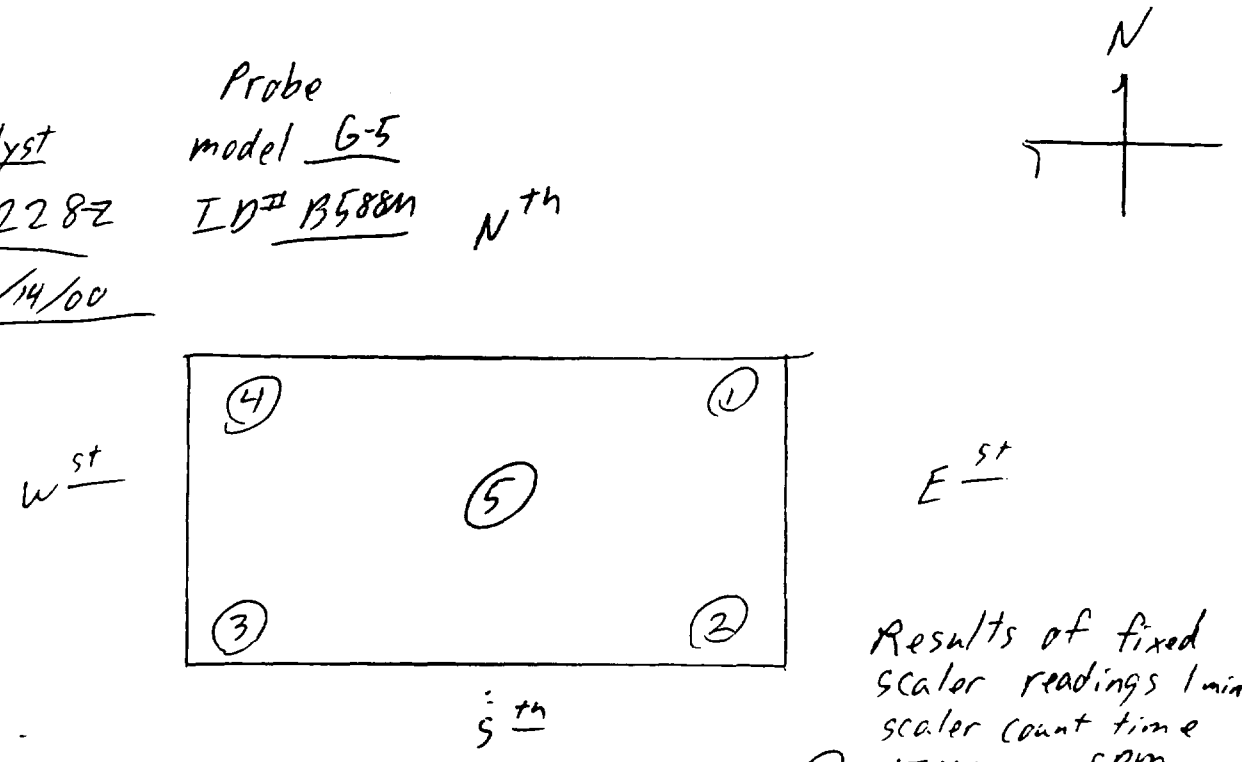
LOCATION: Grid 26N, Confirmation Survey

MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:

Fidler Box
model analyst
ID# A228Z
Cal Due 5/14/00

Probe
model G-5
ID# B588M



Results of fixed scaler readings 1 minute scaler count time cpm

1. 17168
2. 17649
3. 21523
4. 22 232
5. 20,601

Sample ID# 990804603

REMARKS: Scanning results for walk over survey = 20-30K cpm
BKG: measured @ HP access station (log in station) = 10K cpm
All readings LI x BKG (measured in grid)
Average fixed scaler reading = 19835

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Leuenberger R Leuenberger

Reviewed by: [signature] Date: 8/17/95

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

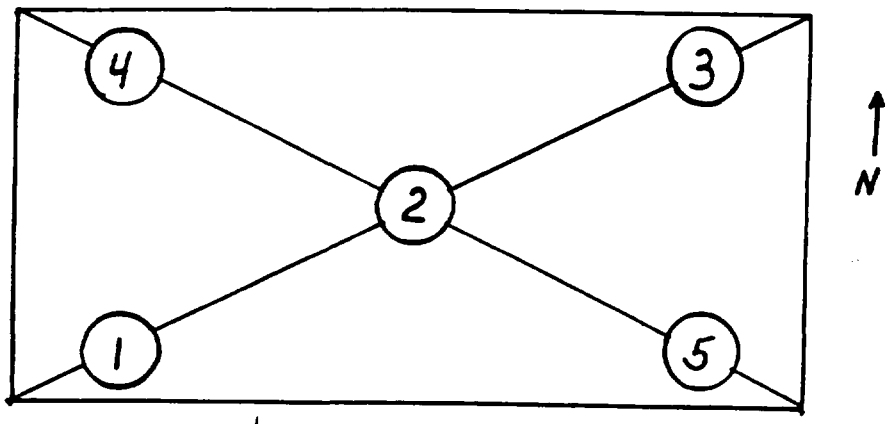
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 6	Time: 1257	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 26 South

Bicron analyst # A2282	Ludlum 2221 # 157018
" G-5 # B588M	" 44-10 # 163158
Cal Due 5-14-00	cal due 7-14-00

SKETCH:



Bkgd	20046 cpm	5101 cpm
walkover	15-24 K cpm	4200 - 6300 cpm
#1	19207 cpm	5627 cpm
#2	15108 cpm	4571 cpm
#3	13053 cpm	3519 cpm
#4	19001 cpm	5993 cpm
#5	16393 cpm	4716 cpm

REMARKS: All measurements < 2 times BKG 8/7/99
Sample ID # 990806601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T Blakeslee / T. Blakeslee /

Reviewed by: R Zenenberger Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

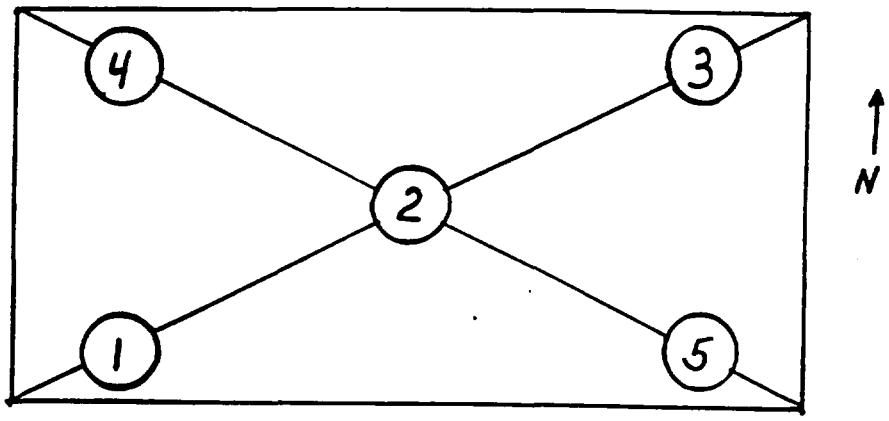
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 06	Time: 1304	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 9 North

Bicron analyst # A2282	Ludlum 2221 # 157018
" G-5 # B588M	" 44-10 # 163158
Cal Due 5-14-99	cal. due 7-14-00

SKETCH:



Bkgd	21473 cpm	5610 cpm
walkover	18-24K cpm	5000 - 6600 cpm
#1	20183 cpm	5842 cpm
#2	19030 cpm	5244 cpm
#3	18432 cpm	5004 cpm
#4	20223 cpm	5866 cpm
#5	18235 cpm	5031 cpm

REMARKS: All measurements < 2 X BKG 8/7/99

Sample ID # 990806602

SU / TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R. Zenenberger Date: 8/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 6	Time: 1330	Page 1 of 1
RWP No. ~~99 00~~ DRJ N/A	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: Grid 132 "Hot Spot"

PURPOSE OF SURVEY: Resolution of ~~Hot S~~ Hot Spot identified on 8/2/99 8/6/99

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
A2282/B588m	5/14/00	— / —	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☒ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

cpm/probe area

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm ~~per 100 cm²~~ dpm βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
1	"Hot Spot" Location Pre-Removal		18-20,000			Readings taken with ~2" of new stone
2	"Hot Spot" Location Post-Removal		10-12,000			Readings taken with area dropped approx. 8" *

REMARKS: * Soil and rock removed from Hot Spot area placed in Exclusion Area for later removal.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

/ / / /

Reviewed by: K Zeuenberg

Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

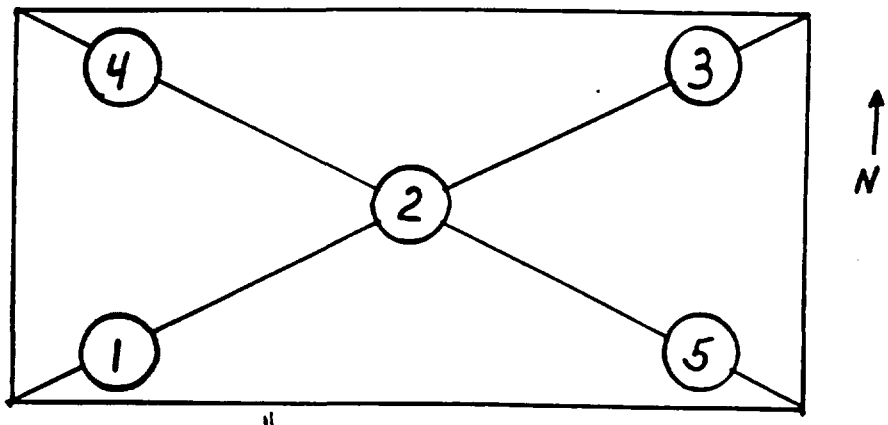
..E: MILLENIUM	DATE: Yr 99 Mo 08 Dy 07	Time: 1421	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 9 South Grid Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M
Cal Due 5-14-00

Ludlum 2221 # 157018
" 44-10 # 163158
cal due 7-14-00

SKETCH:



Bkgd	18243 cpm	
walkover	15-25K cpm	4736 cpm
#1	16954 cpm	4000 - 5500 cpm
#2	16419 cpm	4576 cpm
#3	15966 cpm	4630 cpm
#4	17569 cpm	4596 cpm
#5	16397 cpm	4914 cpm
		4682 cpm

REMARKS: Sample ID # 990807601

S EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Eberberger Date: 8/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

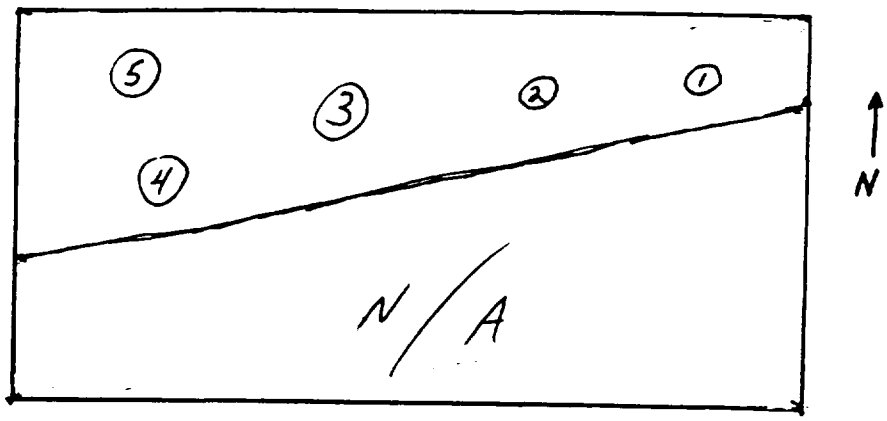
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 07	Time: 1427	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 10 North Grid Confirmation Survey

Bicron analyst # A2282	Ludlum 2221 # 157018
" G-5 # B588M	" 44-10 # 163158
Cal Due 5-14-00	Cal. Due 7-14-00

SKETCH:



Bkgd	17771 cpm	4456 cpm
walkover	15-22K cpm	3700 - 5200 cpm
#1	16956 cpm	4745 cpm
#2	16776 cpm	4577 cpm
#3	16623 cpm	4723 cpm
#4	14450 cpm	3854 cpm
#5	17121 cpm	4912 cpm

REMARKS: Sample ID # 990807602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R. Thunberg Date: 8/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

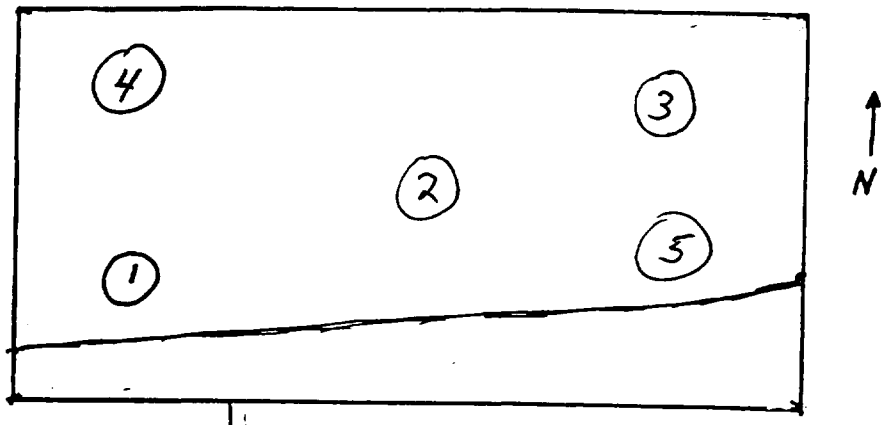
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 07	Time: 1435	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 11 North Grid Confirmation Survey

Bicron analyst # A228Z	Ludlum 2221 # 157018
" G-5 # B588M	" 44-10 # 163158
Cal Due 5-14-00	cal. due 7-14-00

SKETCH:



Bkgd	18460 cpm	4769 cpm
walkover	15-22 K cpm	3600 - 5300 cpm
#1	13079 cpm	3739 cpm
#2	15220 cpm	4033 cpm
#3	18463 cpm	5159 cpm
#4	16363 cpm	4756 cpm
#5	13793 cpm	3795 cpm

REMARKS: Sample ID # 990807603

TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Zuenberg Date: 8/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

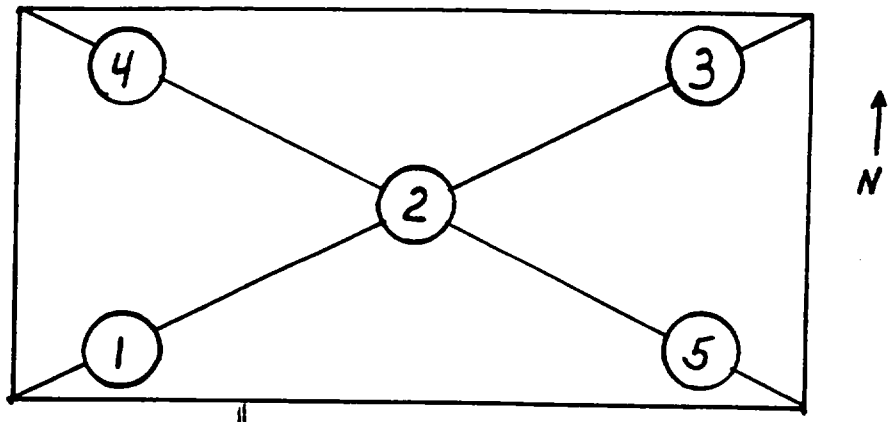
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 07	Time: 1445	Page 1 of 1
RWP No. 004	WORK ORDER No.	BLDG. No.	

LOCATION: 12 south Grid Confirmation Survey

Bicron analyst # A2282	Ludlum 2221 # 157018
" G-5 # B588M	" 44-10 163158
Cal Due 5-14-00	cal. due 7-14-00

SKETCH:



BKgd	19694 cpm	5165 cpm
walkover	15-22 K cpm	4300 - 5600 cpm
#1	16510 cpm	4411 cpm
#2	18227 cpm	4956 cpm
#3	16480 cpm	4829 cpm
#4	18889 cpm	5265 cpm
#5	17185 cpm	4569 cpm

REMARKS: Sample ID # 990807604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Zenenberger Date: 8/9/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 8/9/99 – 8/13/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results[2] (pCi/g; Ra-226&Ra-228)**	**Comments**
116 West	8/9/99	<2 X Bkg	2.5	
39 West	8/9/99	<2 X Bkg	2.2	
38 North	8/9/99	<2 X Bkg	1.9	
122 West	8/10/99	<2 X Bkg	NA	
123	8/10/99	<2 X Bkg	NA	
27 NW	8/10/99	<2 X Bkg	2.6	
37 SE	8/10/99	<2 X Bkg	2.2	
116 East	8/11/99	<2 X Bkg	2.9	
115	8/11/99	<2 X Bkg	3.0	
118	8/11/99	<2 X Bkg	NA	
122 East	8/11/99	<2 X Bkg	NA	Hot Spot was detected and Remediated.
117 West	8/12/99	<2 X Bkg	2.6	
117 East	8/12/99	<2 X Bkg	3.0	
114[4]	8/12/99	<2 X Bkg[5]	2.6	4) Hot Spots where detected during initial survey, bias sampled, and remediated. 5) Initial Scan > 2 X Bkg 6) Initial Results =14.3 pCi/g
28 E (SE ½)	8/12/99	<2 X Bkg	2.3	
12 North	8/12/99	<2 X Bkg	2.4	
25 East	8/12/99	<2 X Bkg	2.4	
25 W (SE ½)	8/12/99	<2 X Bkg	2.4	
41	8/12/99	<2 X Bkg	2.2	
54	8/12/99	<2 X Bkg	3.6	
42 South	8/12/99	<2 X Bkg	3.7	
42 North[4]	8/12/99	<2 X Bkg[5]	2.0	4) Hot Spots where detected during initial survey, bias sampled, and remediated. 5) Initial Scan > 2 X Bkg 6) Initial Results = 15.6 pCi/g
112/113	8/13/99	<2 X Bkg	3.7	Hot Spot was detected and Remediated.
43 East	8/13/99	<2 X Bkg	2.1	
43 West	8/13/99	<2 X Bkg	2.1	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

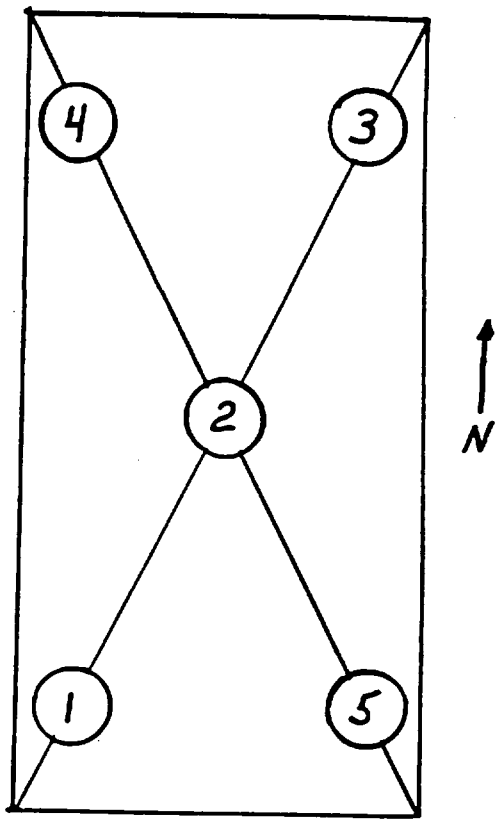
S... MILLENIUM	DATE: Yr 99 Mo 08 Dy 09	Time: 1740	Page 1 of 1
RWP No. work 99003 sampling 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 116 west Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M
Cal. Due 5/14/00

SKETCH:

Bkgd 16771 cpm
walkover 14-19,000 cpm
1 14043 cpm
2 12516 cpm
3 12933 cpm
4 12587 cpm
5 14151 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990809604

SL / TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: M Zemenberg Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 09	Time: 1756	Page 1 of
RWP No. 99-004	WORK ORDER No.	BLDG. No. N/A	

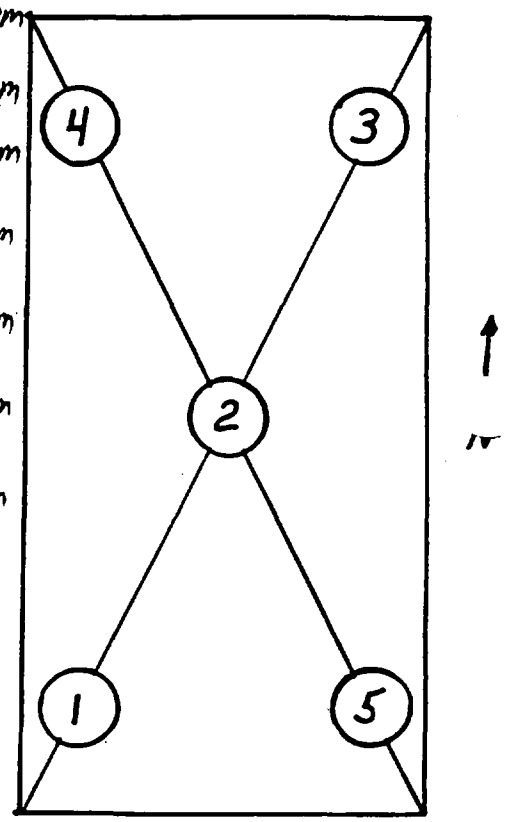
LOCATION: 39 West

Bicron analyst # A228Z Fidler " G-5 # B588M Cal. Due 5-14-00	Ludlum 2221 # 157018 " 44-10 # 163158 SaI 2"x2" Cal due 7-14-00

SKETCH: Fidler

Bkgd	18269 cpm		MA-4630 cpm
walkover	15-24K cpm		walkover 3300-5600cpm
# 1	13967 cpm		3417 cpm
# 2	13687 cpm		3759 cpm
# 3	17531 cpm		5013 cpm
# 4	15665 cpm		4191 cpm
# 5	14976 cpm		3998 cpm

SaI 2"x2"



REMARKS: All readings < 2 times BKG
Sample ID #: 990809601
990809602 (DUP)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: K Zenenberger Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

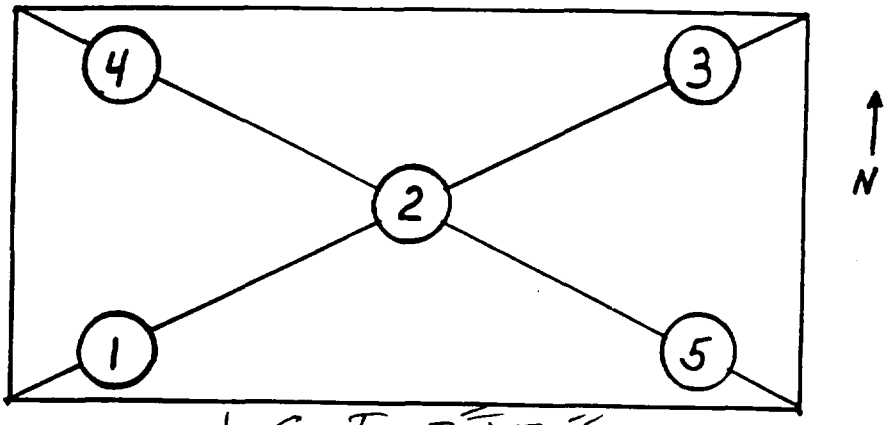
RADIOLOGICAL SURVEY REPORT (MAP)

E: MILLENIUM	DATE: Yr 99 Mo 08 Dy 09	Time: 1803	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

LOCATION: 38 North

Bicron analyst # A228Z Fidler " G-5 # B588M Cal Due 5-14-00	Ludlum 2221 # 157018 SaI 2"x2" " 44-10 # 163158 cal due 7-14-00

SKETCH:



Fidler

Bkgd	24235	cpm
walkover	17-28K	cpm
#1	17789	cpm
#2	17534	cpm
#3	15005	cpm
#4	18420	cpm
#5	15562	cpm

SaI 2"x2"

BKG	CPM 5871
walkover	CPM 3900-7500
	CPM 4960
	CPM 4772
	CPM 4246
	CPM 5195
	CPM 4258

REMARKS: All measurements < 2 times BKG
Sample ID # 990809603

SI Y TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: [signature] Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

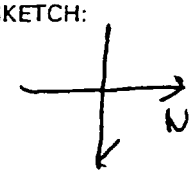
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 10	Time: 1430	Page 1 of 1
RWP No. 99003 / 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 122 West Confirmation Survey

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler ser # B 441 G/13668V
Cal due 5/14/00
bkg 14,288

Walkover survey only for Hot Spot recognition.

Walkover readings 10 - 18,000 cpm

REMARKS: All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Zenenberger Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

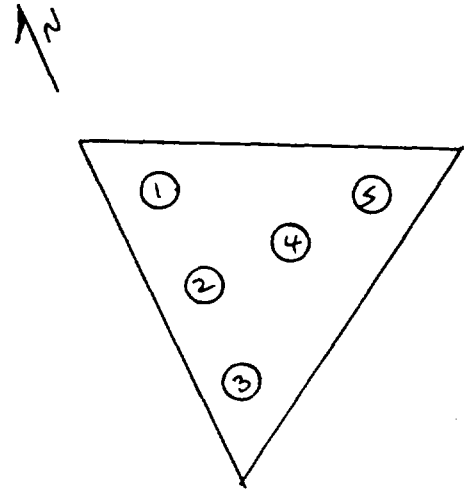
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 10	Time: 1700	Page ___ of ___
RWP No. 99-004	WORK ORDER No.	BLDG. No. MRP	

LOCATION: 27 N.W. GRID Confirmation Survey

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D.E. 8-10-99 ☐ = AIR SAMPLE LOCATION

○ = 1 min. counts of sample location

SKETCH:



Bkgd 21,617 cpm

walk over 18000, 30000 cpm

#1. 18,611 cpm

#2. 19,503 cpm

#3. 20,162 cpm

#4. 20,400 cpm

#5. 19,477 cpm

REMARKS: Inst. → Bicron A 2282 w/ G-5 Detector
cal. Date Due → 5-14-00 D.E.
Sample ID# 990810602
All reading L2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATAN / [signature] / 100163

Reviewed by: [signature] Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

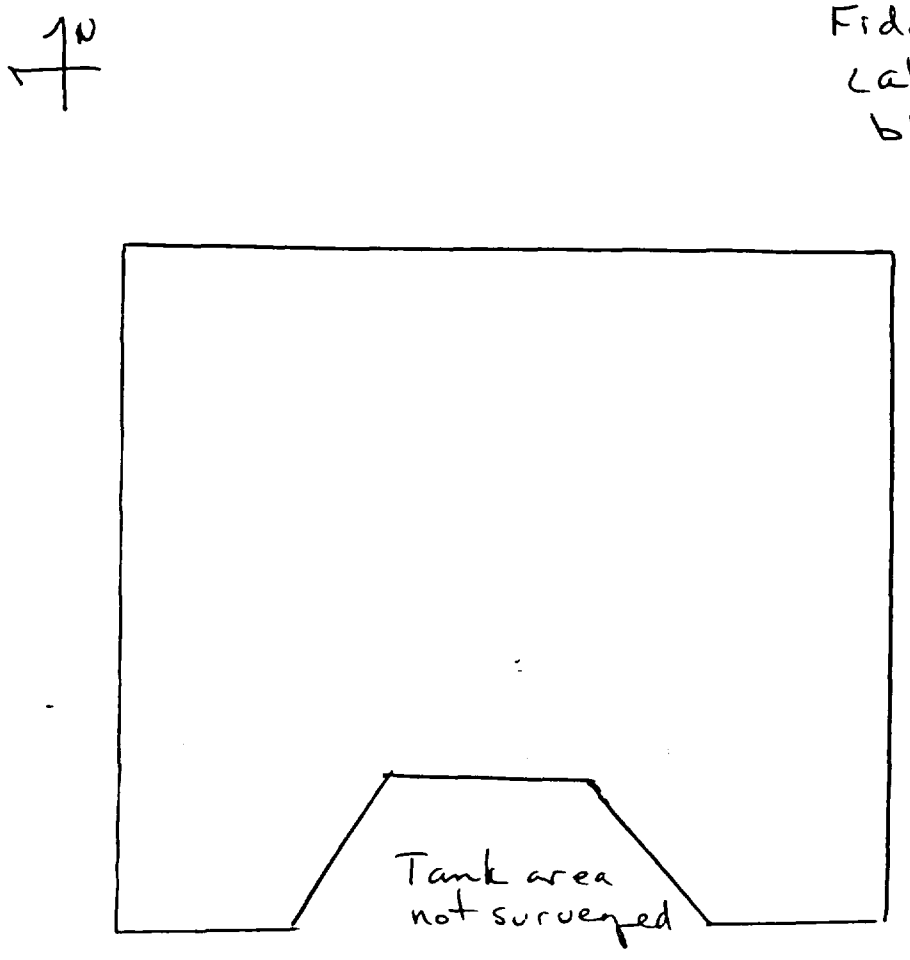
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 10	Time: 1600	Page 1 of 1
RWP No. 99003/99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 123 Confirmation Survey

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler ser # B441G/B668V
cal due 5/14/00
bkg 17,747

Walkover survey for Hot spot recognition.

Walkover readings 15-24,000 cpm

REMARKS: All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Zenenberg Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

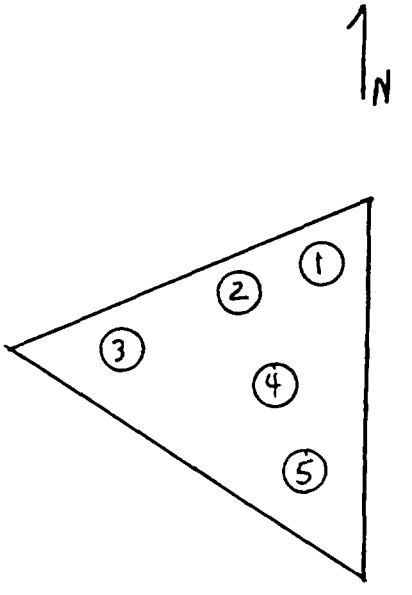
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 10	Time: 1700	Page ___ of ___
RWP No. 99-004	WORK ORDER No.	BLDG. No. MRP	

LOCATION: GRID 37 S.E. Confirmation Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D-E 8-10-99 ☐ = AIR SAMPLE LOCATION

◯ = 1 min. counts of sample locations

SKETCH:



Bkgd	22,262	cpm
Walk Over	18,000 - 25000	cpm
#1	19,298	cpm
#2	17,603	cpm
#3	18,544	cpm
#4	22,341	cpm
#5	19,311	cpm

REMARKS: Inst. → Bicron A 2282 w/ G-5 Detector
Cal. Date Due 5-14-00. D-E
Sample ID # 990810601
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATON / [signature] / #100163

Reviewed by: R [signature] Date: 8/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

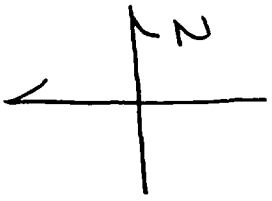
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 11	Time: 1015	Page 1 of 1
RWP No. 99003 / 99004	WORK ORDER No. N/A	BLDG. No. N/A	

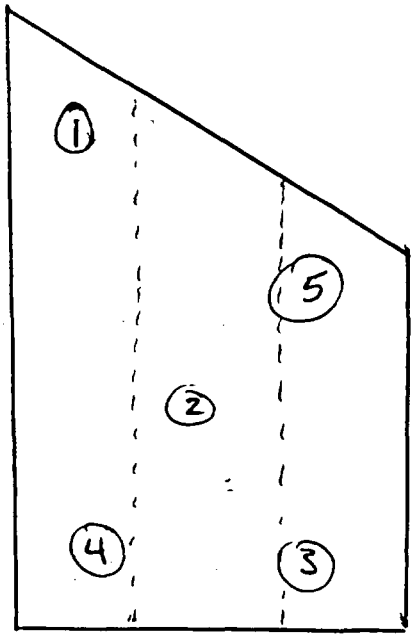
LOCATION: Grid 116 East

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION DRJ 99/8/11 ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler Ser # A2287/13588M
cal due 5/14/00
bkg. 17,904



One minute readings

1. 24584
2. 15464
3. 19744
4. 20526
5. 13591

93909
÷ 5
Avg. 18722

Walk through reading range:
15 - 30,000 cpm

Sample ID# 990811601

REMARKS: Dashed lines indicate concrete foundation of old outfall. Sample taken was soil from 1, 3, 4, 5 ONLY. Approximately 1¼ l from each spot.
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DR Jenkins / DR Jenkins /

Reviewed by: K Zenenberg Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

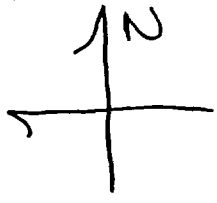
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 11	Time: 1050	Page 1 of 1
RWP No. 99 003/ 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

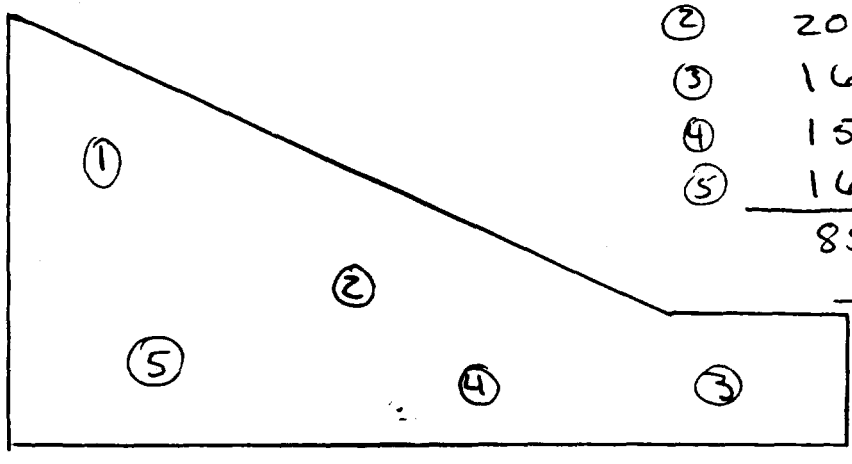
LOCATION: Grid 11 ~~7~~5 Confirmation Survey

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE~~ Sample DRS 8/9/99 LOCATION DRJ 8/11/99 ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler Ser # A 2287 / B588M
cal due 5/14/00
bkg 20972
one minute readings
① 16686
② 20192
③ 16671
④ 15289
⑤ 16287
85125
÷5
17025 Avg.



Walk through reading range:

15 - 25,000 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990811602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: K Leuenberger Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1055	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

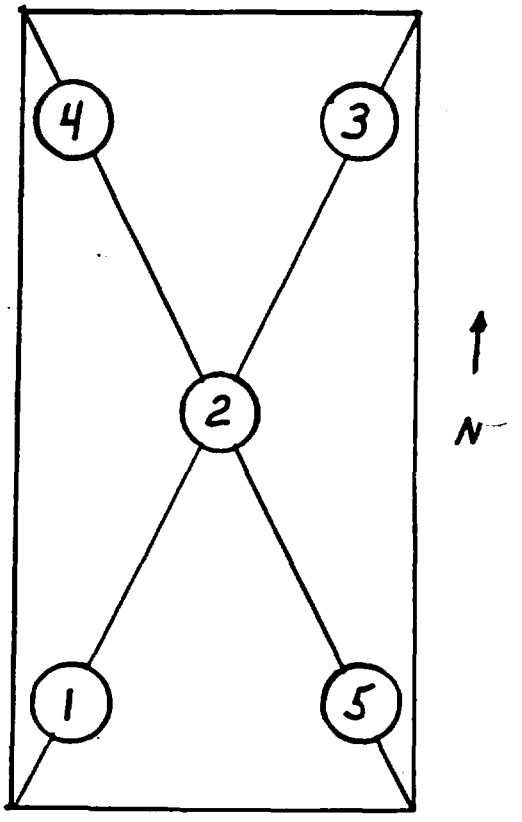
LOCATION: Grid 117 West Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5/14/00

SKETCH:

Bkgd	14,198 cpm
walkover	10-20,000 cpm
# 1	15730 cpm
# 2	15574 cpm
# 3	13336 cpm
# 4	15654 cpm
# 5	14083 cpm
	74377
	÷ 5
Avg	14,875 cpm



REMARKS: All readings < 2 times BKG
Sample ID # 990812601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D Jenkins / [signature] /

Reviewed by: R Hamberger

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

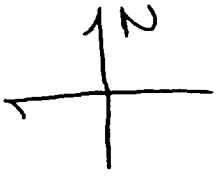
RADIOLOGICAL SURVEY REPORT (MAP)

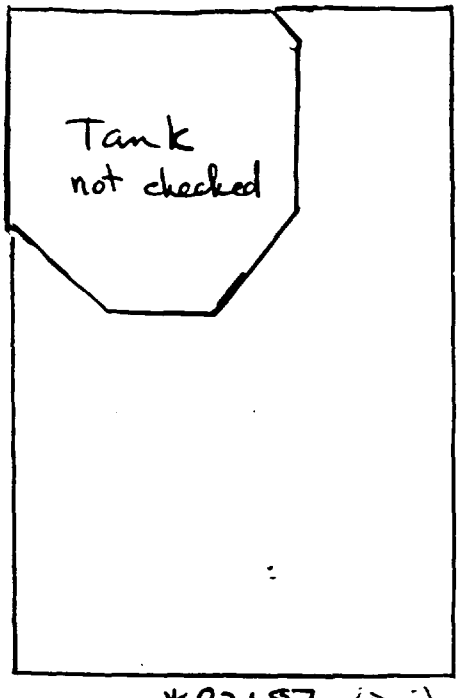
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 11	Time: 1630	Page 1 of 1
RWP No. 99003/99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 122 East Confirmatory Survey

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:





Fiddler serial A2287/B588M
cal due 5/14/00
bkg 13,422

Walkover survey only for "Hot Spot" recognition.

Walk over reading range 7 - 22,000 cpm.

Found "Hot Spot" as indicated by asterisk just outside area.

*92,187 cpm initial reading
24,000 cpm post removal

REMARKS: Removal of Hot Spot required ~~4~~ 5 digs by trackhoe. PNJ 8/11/99
All readings after Hot Spots removed < 2 times Bkg

IRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

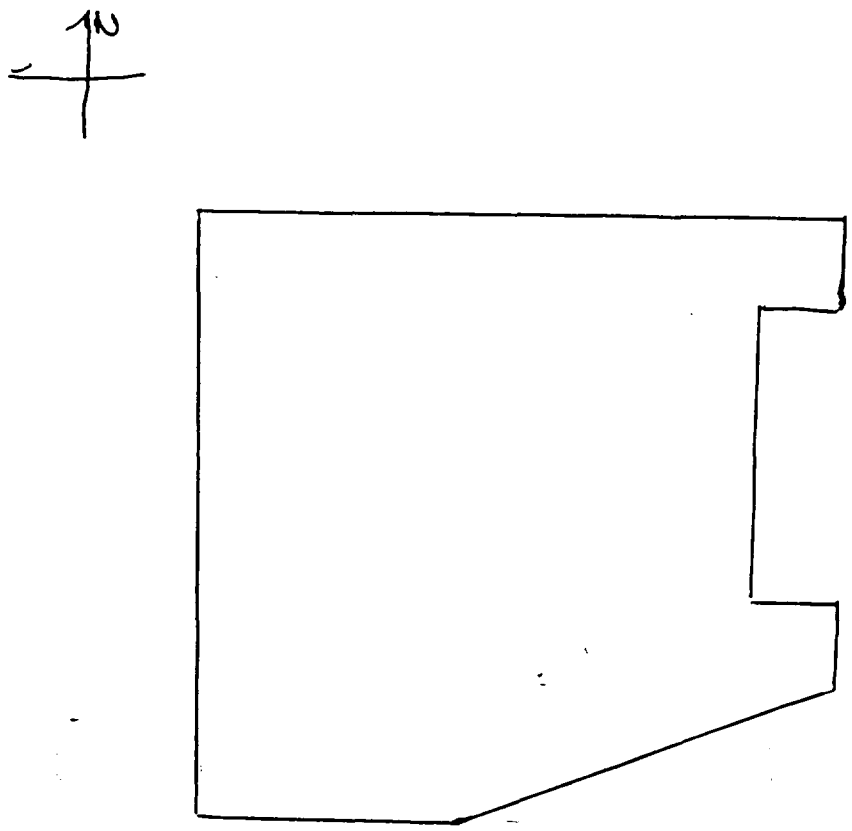
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 11	Time: 1600	Page 1 of 1
RWP No. 99003/99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 118 Confirmation Survey

MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Fiddler ser # A2287/~~58~~ 3588M BRS 8/11/99
Cal due 5/14/00
bkg 13,597

Walkover survey for Hot spot recognition

Walkover readings 7 -20,000 cpm

REMARKS: All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Ehrenberger Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1205	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 117 East Confirmatory Survey

Bicron analyst # B441G
" G-5 # BG68V

Cal. Due 5/14/00

SKETCH:

Bkgd 14,469 cpm

walkover 10-22,000 cpm

1 15195 cpm

2 13370 cpm

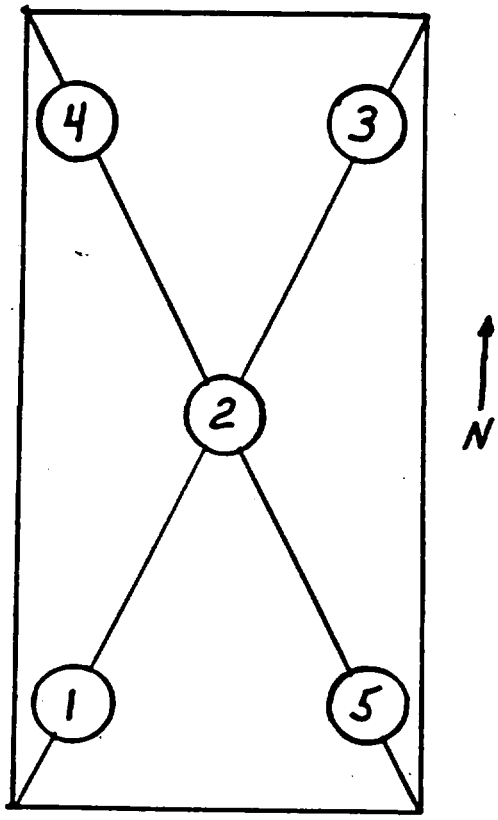
3 9782 cpm

4 20240 cpm

5 14348 cpm

72935 cpm
÷ 5

Avg. 14587 cpm



REMARKS: All readings <2 times Bkg

Sample ID # 990812602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

/ / / /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

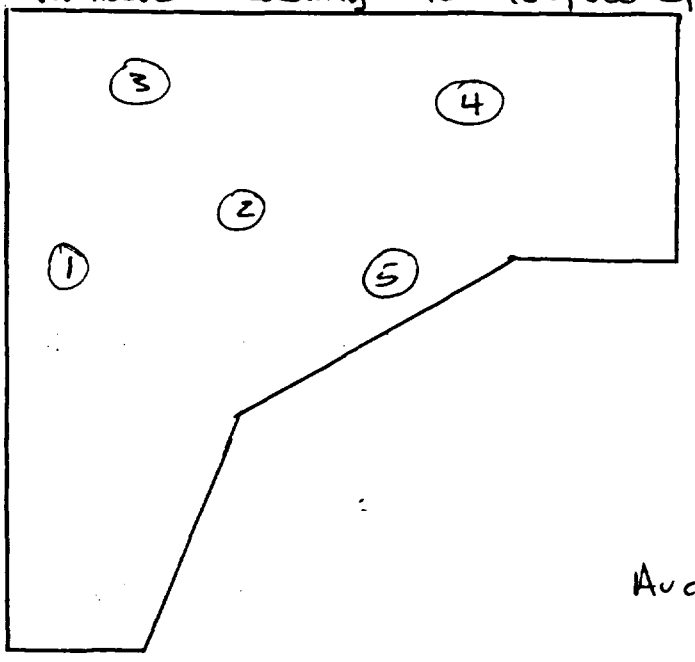
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1530	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 114 Confirmatory Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample DRJ LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Fiddler ser #: B441G/B668Y cal due: 5/14/99
BKG: 42876

Walkover reading: 10 - 450,000 cpm



One minute scaler (cpm)	
1	65,738
2	79,278
3	58,833
4	35,661
5	21,140
	260,650
	÷ 5
Avg.	52,130

REMARKS: Areas around 4 and ~~4~~ 5 were dug out prior to sampling due to readings of 90,000 and 450,000 cpm respectively. DRJ 8/13/99
Sample ID# 990812603 (initial sample)
Sample ID# 990813602 (follow-up sample)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / DR Jenkins /

Reviewed by: [signature] Date: 8/19/99

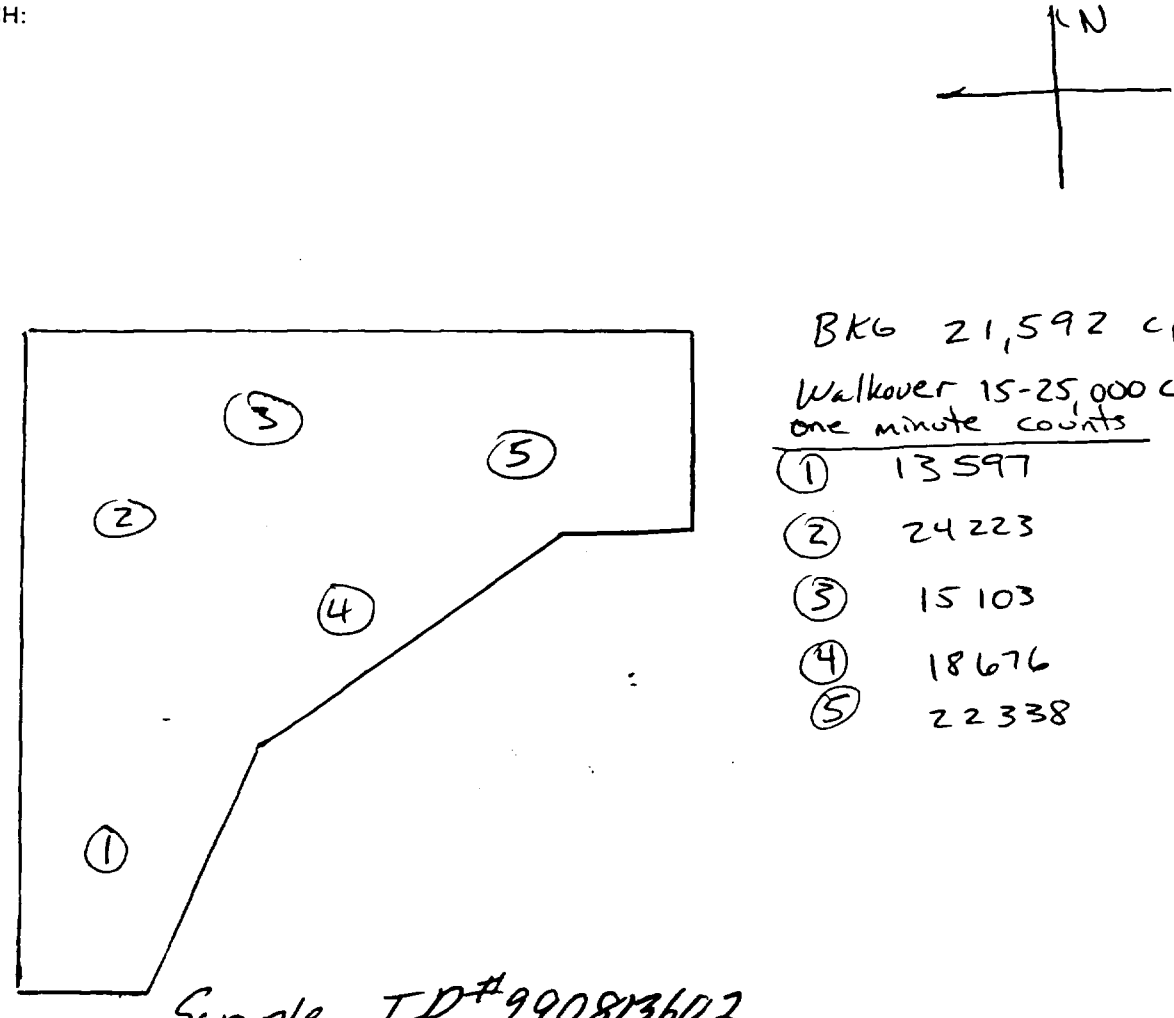
MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 13	Time: 1645	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	
LOCATION: Grid 114	Confirmation Survey		

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample DY LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



BKG 21,592 cpm
Walkover 15-25,000 cpm
one minute counts

1	13597
2	24223
3	15103
4	18676
5	22338

Sample ID# 990813602

REMARKS: Survey and resample after further excavation to remove "Hot Spots"

All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: [signature] Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

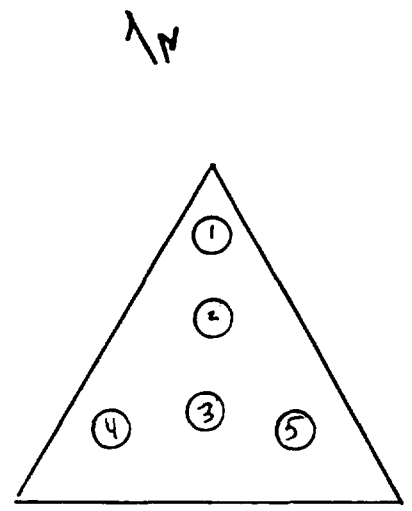
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1600	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: S.E. ½ of Grid 28 E

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D.L 8-12-99 ☐ = AIR SAMPLE LOCATION

○ = one mini counts of sample location

SKETCH: Confirmation Survey



Bkgd 19766 cpm

walk over 18000, 21,000 cpm

1. 18,544 cpm
2. 18,376 cpm
3. 17,455 cpm
4. 18,738 cpm
5. 17,517 cpm

REMARKS: Inst. Bicron Analyst # B441G Cal Date. 5-14-99 w/ G-5 #B668V

* All Reading < 2 x Bkgd
sample ID # 990812-608

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: David Eaton / [signature] / 100163

Reviewed by: [signature] Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

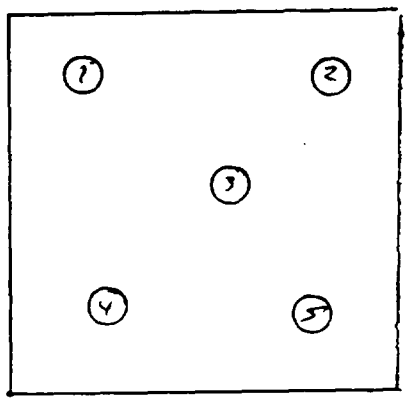
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 12	Time: 1600	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: GRID 12 N

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ DE 8-12-99 ☐ = AIR SAMPLE LOCATION

○ = 1 min. count of sample location

SKETCH: Confirmation Survey



Bkgd 18,973

Walkover 16000 - 21000 cpm

1. 18,975 cpm

2. 17,342 cpm

3. 16,844 cpm

4. 16,966 cpm

5. 17,137

REMARKS: Inst. Bicron Analyst * B441G Cal. Date. 5-14-99 w/ G-5 *B668V

* All Readings <2xBkgd.
Sample ID# 990812607

'RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATON / [signature] / 100163

Reviewed by: [signature] Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

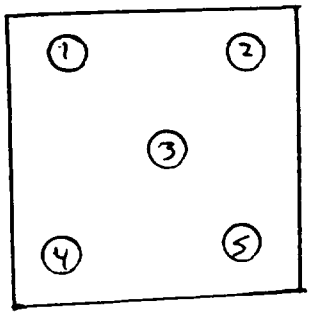
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 12	Time: 1600	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	
LOCATION: 25E			

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D.E 8-12-99 ☐ = AIR SAMPLE LOCATION

○ = 1 min count of sample location

SKETCH: Confirmation Survey

N



Bkgd 17,831 cpm

walkover 16000-21000 cpm

#1. 18,663

2. 17,137

3. 17,501

4. 16,994

5. 16,937

REMARKS: Inst. Bicron Analyst #B441G cal Date 5-14-99 w/ G-S #B668V

* All Readings < 2 x Bkgd
Sample ID # 990812606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATON / [signature] / 100163

Reviewed by: R Lenenberger Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

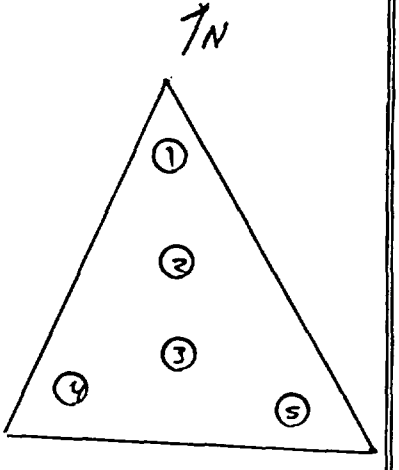
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1600	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: S.E. ½ of Grid 25 W

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D.E 8.12.99 ☐ = AIR SAMPLE LOCATION

◯ = 1 min. Count of sample Location

SKETCH: Confirmation Survey



Bkgd 18,011 cpm

Walkover 16000, 21,000 cpm

#1. 16,862 cpm

2. 16,824 cpm

3. 16,757 cpm

4. 17,024 cpm

5. 16,733 cpm

REMARKS: Inst. Bicron Analyst * B441G Cal Date. 5-14-00 w/ G-5 * B668V

* All Readings < 2x Bkgd
Sample ID #990812609

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID EATON / [signature] / 100163

Reviewed by: [signature] Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1800	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

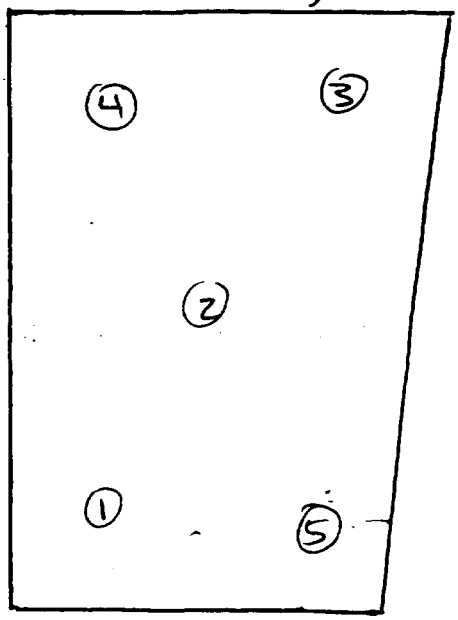
LOCATION: Grid 41 Confirmatory Survey

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE~~ Sample DRJ LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Fidler Ser # A 2282/~~B558M~~ cal due. 5/14/00
Bkg: 18,041 cpm

N

Walkover readings 16-28,000 cpm



One minute readings (cpm)

1	15,475
2	17,314
3	14,158
4	14,032
5	13,054
	74,033
	÷ 5
Avg.	14,807 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990812604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: K Leuenberger Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

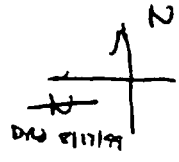
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1830	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

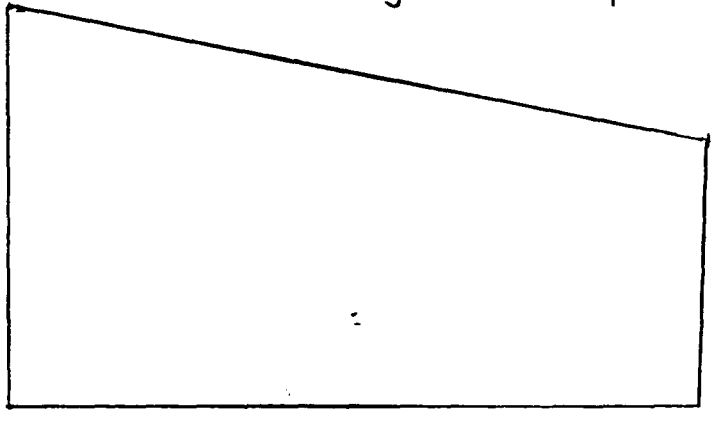
LOCATION: Grid 54 Confirmatory Survey

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE~~ Sample PRS LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: Bicron Fiddler ser # A2282/B588M cal due 5/14/00
BKG 17,720



Walkover readings 15-23,000 cpm



one minute readings (cpm)

①	13,487
②	13,750
③	17,480
④	16,923
⑤	20,033
	81,673
	÷ 5
Avg.	16,335

REMARKS: All readings < 2 times BKG
Sample ID # 990812605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: K Unenberger Date: 8/19/99

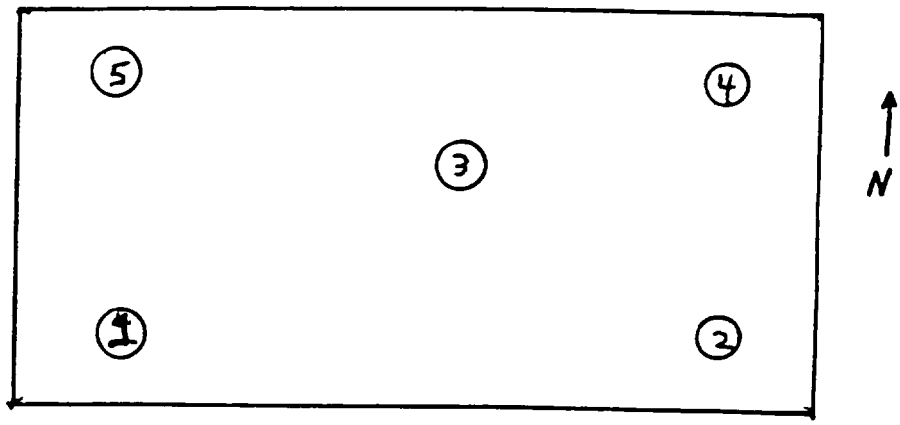
MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1930	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: Grid 42 North
Bicron analyst # A 2282
" G-5 # B588M
Cal Due 5-14-00

SKETCH: confirmation Survey



Bkgd	25,351	cpm
walkover	16,000 - 51000	cpm
#1	17,718	cpm
#2	19,789	cpm
#3	16,700	cpm
#4	47,901	cpm
#5	51,380	cpm

REMARKS: Sample points 4 & 5, Attempted to dig up by shovel.
Note. # 5 > 2x Bkgd.
Bias samples taken at locations of elevated readings
Sample ID #s 990812610 (initial sample) #990818604 (follow-up - post remediation)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID EATON / Dal Eat / 100163

Reviewed by: R Zenenberg Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

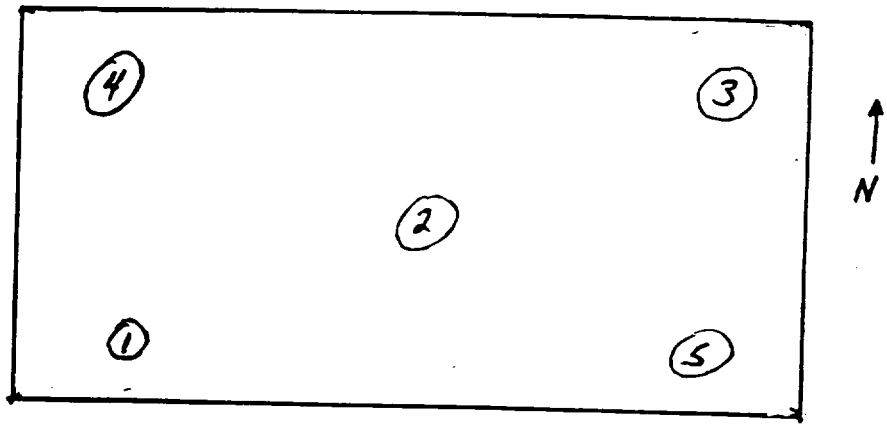
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy ~~12~~ 18	Time: 2000	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 42 north Confirmatory Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 15941 cpm
walkover 15000 - 30000 cpm
#1 13027 cpm
#2 12934 cpm
#3 17790 cpm
#4 13991 cpm
#5 14173 cpm

REMARKS: All readings < 2 times BKg
Sample ID # 990818604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zeunberger Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

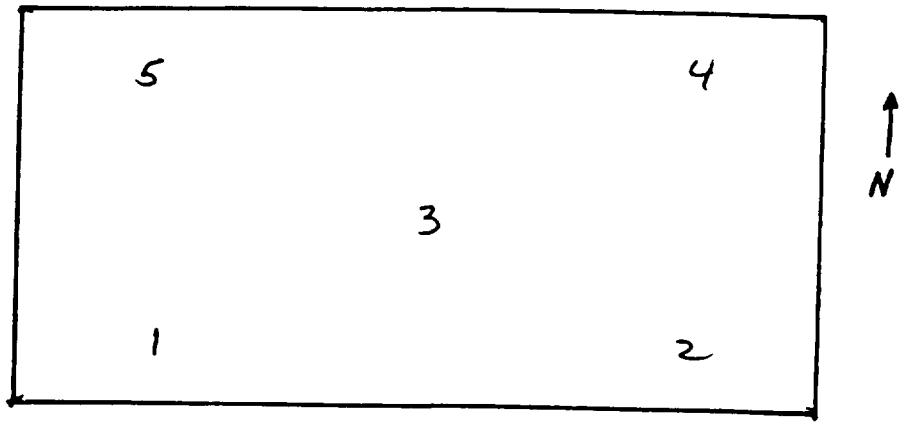
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 12	Time: 1930	Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: Grid 42 South

Bicron analyst # A 2282
" G-5 # B 588m

Cal Due 5-14-00

SKETCH: Confirmation Survey



Bkgd	18,600	cpm
walkover	15000 - 33000	cpm
#1	29,691	cpm
#2	14,270	cpm
#3	14,640	cpm
#4	16,420	cpm
#5	16,982	cpm

REMARKS: * All Readings < 2 x Bkgd.
Sample ID # 990812611

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: David Saxon / [signature] / 100163

Reviewed by: R Jonenberg

Date: 8/13/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

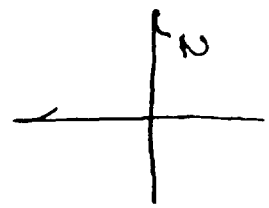
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 13	Time: 0930	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

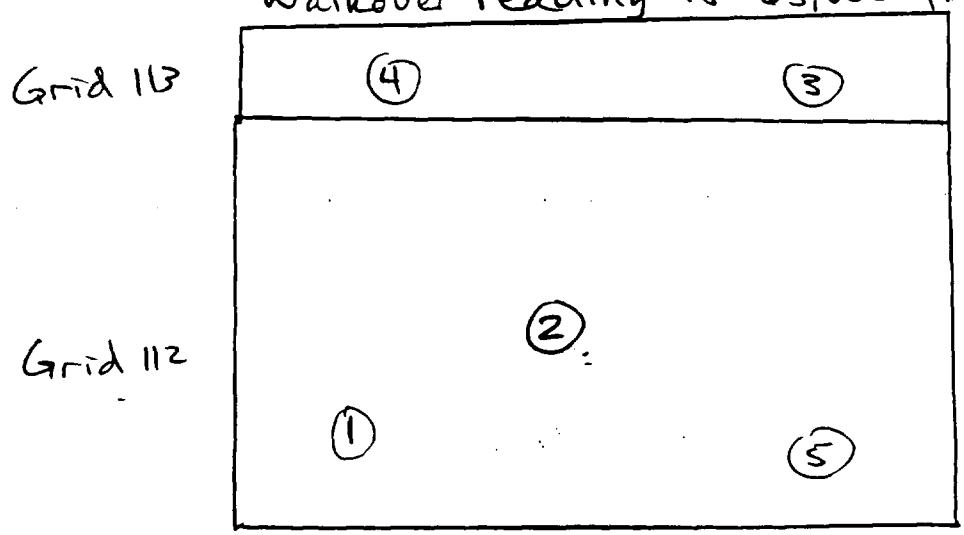
LOCATION: Grid 112/113

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION BRS ☐ = AIR SAMPLE LOCATION

SKETCH: Fiddler ser# A2282/B588M cal due: 5/14/00
Bkg: 24,646 cpm



Walkover reading 15-*65,000 cpm



one minute scaler (cpm)	
1	22,578
2	15,800
3	17,910
4	16,172
5	38,289
	110,749
	÷ 5
Avg	22,150

All readings < 2 times Bkg

REMARKS: Combined sample and walkover area per J. Kyser.
*65,000 cpm area was 5. Material excavated to reduce material in area
Final check in that area indicated 40,000 cpm.
Sample ID # 990816602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: R Zewerberg Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 13	Time: 1832	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No. N/A	

LOCATION: Grid 43 East Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 19310 cpm

walkover 12,000 - 24000 cpm

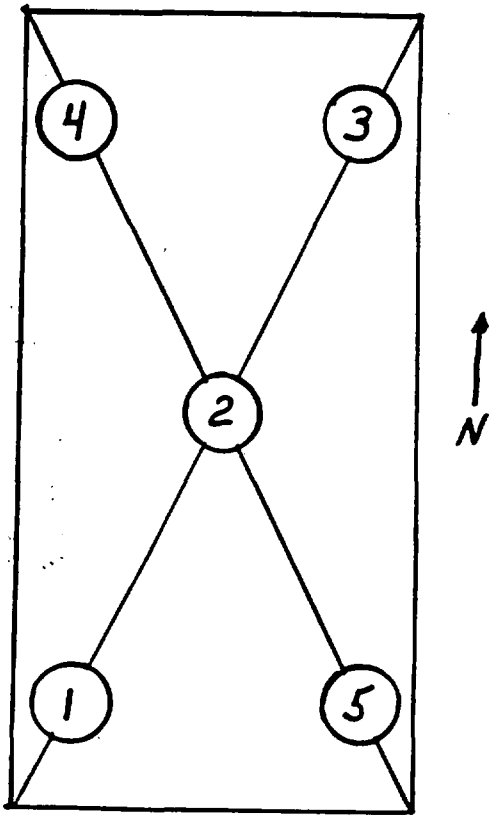
1 16068 cpm

2 15963 cpm

3 20615 cpm

4 18862 cpm

5 17634 cpm



REMARKS: All readings < 2 times background
Sample ID # 990813603, 990813604 (Dup)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

/ / / /

Reviewed by: R Lenenberger Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

S. MILLENIUM	DATE: Yr 99 Mo 08 Dy 13	Time: 1846	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No. N/A	

LOCATION: Grid 43 West Confirmatory Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 22292 cpm

walkover 16000 - 40000 cpm

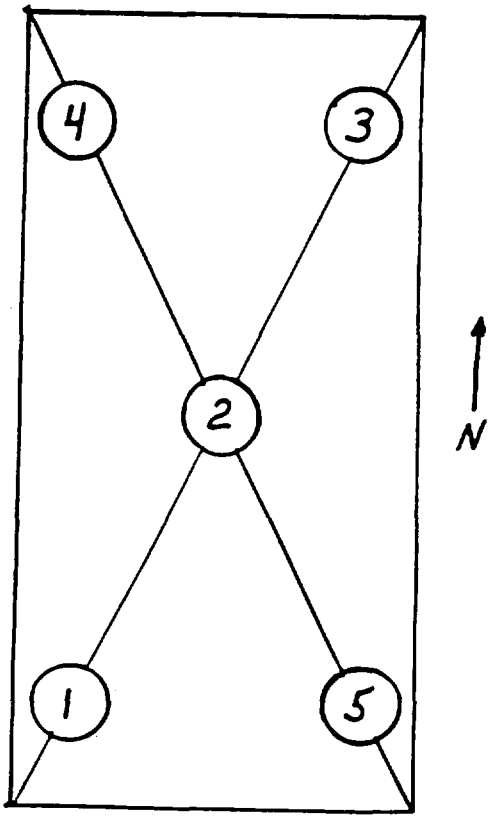
1 18074 cpm

2 20566 cpm

3 19933 cpm

4 23461 8-13-99 ~~19171~~ cpm

5 19171 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990813605

JP TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: K Zhenberger Date: 8/19/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 8/16/99 – 8/20/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results[2]** (pCi/g; Ra-226&Ra-228)	**Comments**
44 East	8/16/99	<2 X Bkg	3.0	
110/111	8/16/99	<2 X Bkg	3.3	Hot Spots were detected and Remediated prior to survey.
109	8/16/99	<2 X Bkg	5.4	Hot Spots were detected and Remediated prior to survey.
108	8/16/99	<2 X Bkg	3.3	Hot Spots were detected and Remediated prior to survey.
28 E (NW ½)	8/16/99	<2 X Bkg	4.4	
37 NW	8/16/99	<2 X Bkg	2.1	
36 E	8/17/99	<2 X Bkg	2.5	
28 W	8/17/99	<2 X Bkg	2.3	Hot Spot was detected and Remediated prior to survey.
36 W (SE ½)	8/17/99	<2 X Bkg	2.5	
25 W (NW ½)	8/17/99	<2 X Bkg	2.1	
14 E	8/17/99	<2 X Bkg	2.0	
24 E	8/17/99	<2 X Bkg	2.2	
107	8/18/99	<2 X Bkg	3.5	
106	8/18/99	<2 X Bkg	6.5	
36 W (NW ½)	8/18/99	<2 X Bkg	2.2	
104/105	8/18/99	<2 X Bkg	2.6	
35 E	8/18/99	<2 X Bkg	2.3	
44 W	8/19/99	<2 X Bkg	2.1	
102/103	8/19/99	<2 X Bkg	6.7	
29 E	8/19/99	<2 X Bkg	2.8	
13	8/19/99	<2 X Bkg	1.5	
14 W	8/19/99	<2 X Bkg	2.1	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
2) Based on measurement limit of detection.

Area Contamination

Contamination was detected outside (i.e., north) of the excavation area in the Fields Brook Flood Plan. This contaminated soil is part of the Fields Brook clean-up work and will not be remediated as part of the MRP Excavation Project.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 16	Time: 0900	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

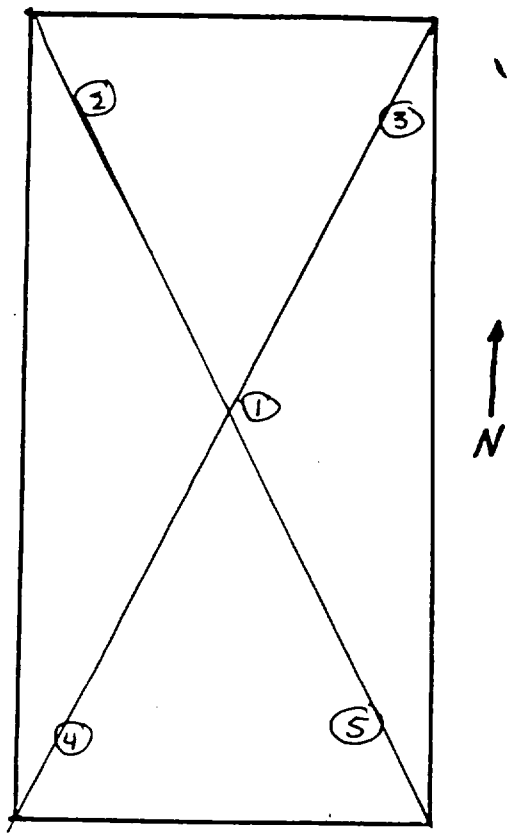
LOCATION: GRID 44 EAST Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	25917	cpm
walkover	15,000 – 30,000	cpm
# 1	18677	cpm
# 2	26947	cpm
# 3	20320	cpm
# 4	22640	cpm
# 5	19491	cpm



REMARKS: All readings < 2 times BKG.
Sample ID # 990816601

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 8/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

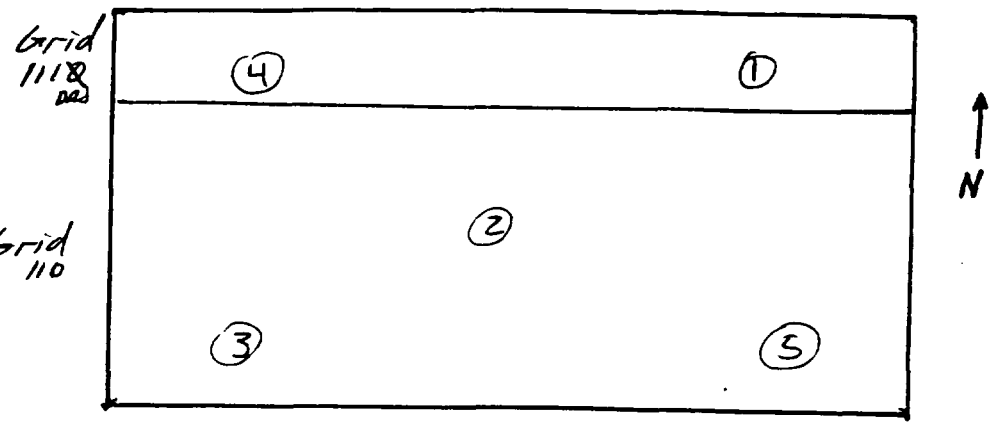
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 16	Time: 1055	Page 1 of —
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 110/111 Confirmatory Survey

Bicron analyst # B 4416
" G-5 # B 6685

Cal Due 5/14/00

SKETCH:



BKgd 20865 cpm
walkover 16-25,000 cpm
#1 19873 cpm
#2 18220 cpm
#3 22595 cpm
#4 17624 cpm
#5 16905 cpm

Sample ID 990816602

REMARKS: Area Hot spots/elevated readings were excavated prior to sampling. Prior to additional excavation, background reading was 36085 cpm and walkover range was 20-100,000 cpm.
All readings after Hot Spots removed < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

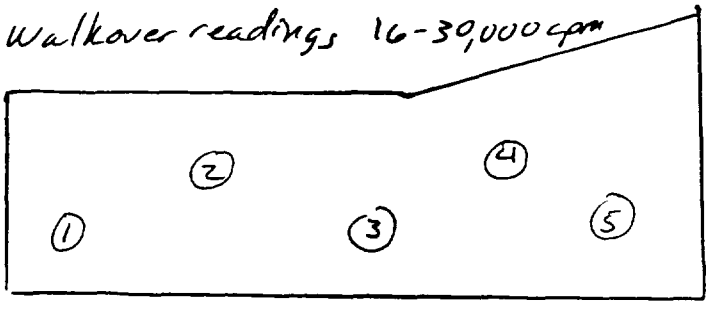
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 16	Time: 1610	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 109 Confirmatory Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION DRS ☐ = AIR SAMPLE LOCATION

SKETCH: Fiddler ser # B4416/13668V cal due 5/14/00
BKg 21,480 cpm



one minute readings (cpm)

1	20857
2	15190
3	15936
4	28123
5	21543
	101649
	÷ 5
AVG	20330 cpm

REMARKS: Area elevated readings were detected from 2-3 and removed prior to sampling. Readings were from 40-60,000 cpm. Sample ID# 990816603
All readings after Hot spots removed < 2 times BKg

'RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DR Jenkins / [signature] /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

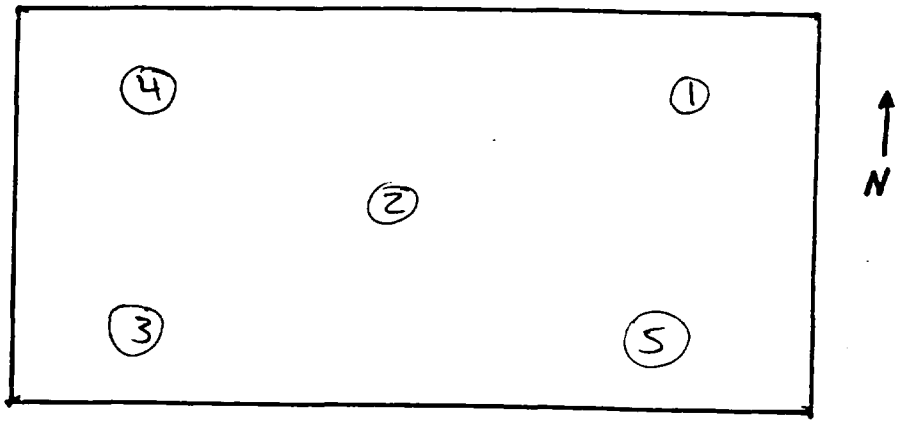
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 16	Time: 1645	Page 1 of —
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 108 Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5/14/00

SKETCH:



Bkgd	21480	cpm
walkover	16-30,000	cpm
#1	16322	cpm
#2	16021	cpm
#3	29384	cpm
#4	25068	cpm
#5	18141	cpm
	104936 ÷ 5	

Avg. 20,987 cpm

Sample ID# 990806604

REMARKS: Samples taken after Hot Spot/Elevated reading area were removed. Prior to additional excavation, background readings were 41,301 cpm, areas 1, 5, 4 contained readings of 40 - 150,000 cpm
All readings after Hot Spots removed < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Lewenberg

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 16	Time: 1830 HR / Page 1 of 1
RWP No. 004	WORK ORDER No. NA	BLDG. No. NA

LOCATION: grid N.W. 1/2 corner of 28 E. middle road

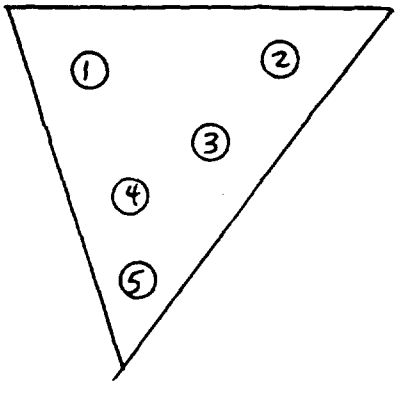
MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE LOCATION~~ D.E. 8-16-99 ☐ = AIR SAMPLE LOCATION

◯ = 1 minute counts of sample location

SKETCH: Confirmation Survey

N

Bkgd	20,507 cpm
(walk over)	16000 – 30,000 cpm
#1.	17,010 cpm
#2	17,660 cpm
#3	18,995 cpm
#4	18,777 cpm
#5	28,790 cpm



Inst. Bicron Analyst
B441G
Probe → B668V G-5
5-14-00 → cal. Date

REMARKS: * All Readings < 2x Bkgd
Sample ID # 990816605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: David Sato / [signature] / 100163

Reviewed by: [signature] Date: 8/17/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 16	Time: 1836	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

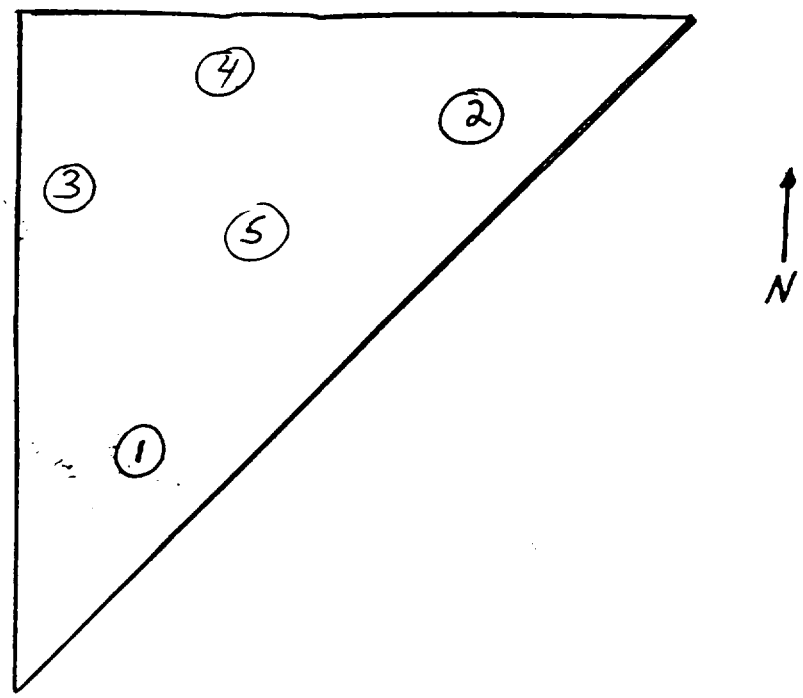
LOCATION: 37 NW Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	20015 cpm
walkover	15000 - 33000 cpm
# 1	30496 cpm
# 2	17104 cpm
# 3	23854 cpm
# 4	18354 cpm
# 5	15493 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990816606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Jennings

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 17	Time: 0820	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

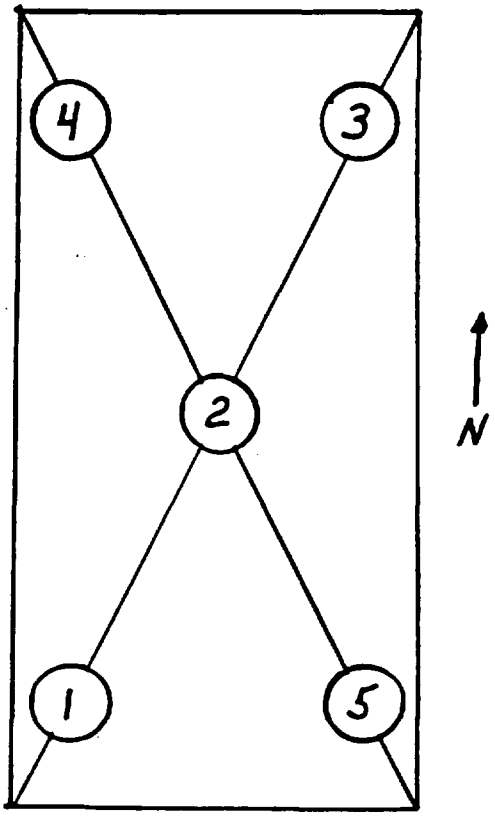
LOCATION: Grid 36 East Confirmatory Survey

Bicron analyst # A22 8Z
" G-5 # B588 M

Cal. Due 5/14/00

SKETCH:

Bkgd	21,697 cpm
walkover	18-26,000 cpm
# 1	15 597 cpm
# 2	18 413 cpm
# 3	17041 cpm
# 4	20511 cpm
# 5	18701 cpm
	90,263 cpm
	÷ 5
	18,053 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990817601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Unenberger

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 17	Time: 0910	Page 1 o.
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

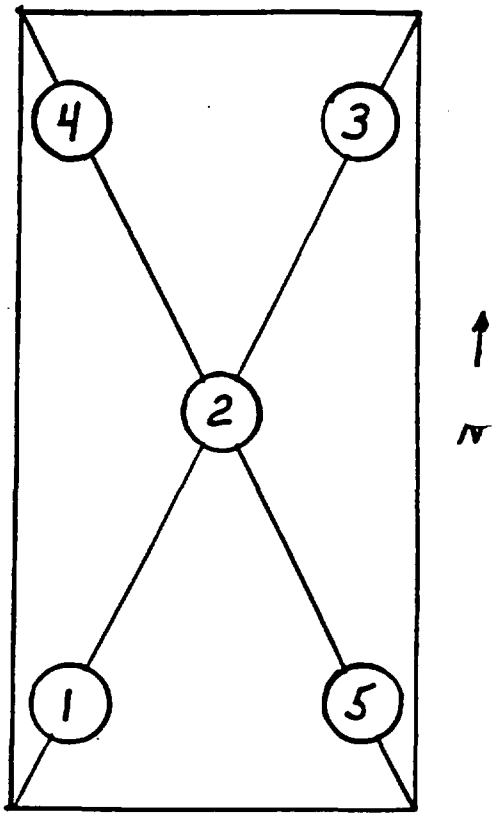
LOCATION: Grid 28 West Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	23,409 cpm
walkover	20-30,000 cpm
# 1	19,456 cpm
# 2	19,894 cpm
# 3	16,900 cpm
# 4	20,616 cpm
# 5	19,164 cpm
	96,030 cpm
	÷5
Avg	19,206 cpm



REMARKS: Area around 5 indicated readings up to 60,000 cpm prior to material being removed.

Sample ID # 990817602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Fernberger

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

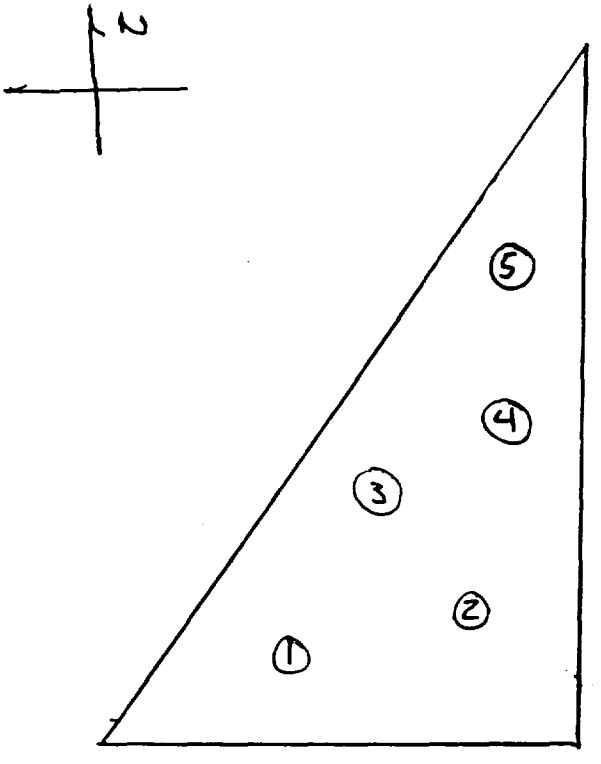
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 17	Time: 1005	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Southeast half of 36 West Confirmatory Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Fidler ser # R 2282 / B588M
cal due: 5/14/00
BKG: 23,940
Walkover readings: 18-27,000 cpm

one minute readings (cpm)

1	19,368
2	19,148
3	19,843
4	20,897
5	21,798
	101,054
	÷ 5
Avg.	20211 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990817603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R. Ellenberger Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

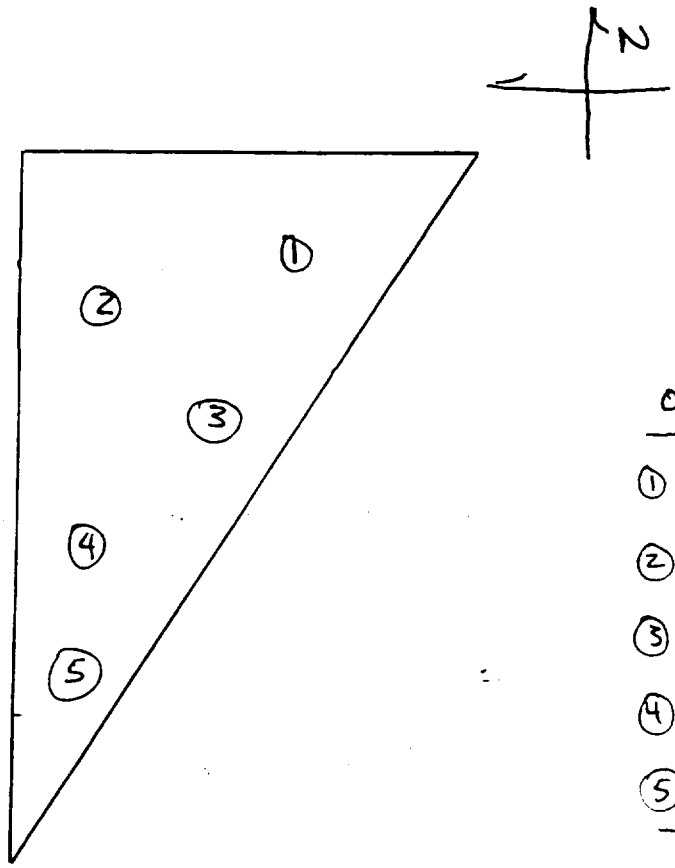
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 17	Time: 1115	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Northwest half of 25 West Confirmatory Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample DRJ LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



A2282/B588M
Fiddler ser# ~~B5~~ DRJ 8/17/99
cal due: 5/14/00
BKG: 20579
Walkover readings:
18-23,000 cpm

one minute readings (cpm)	
1	19 020
2	18 403
3	17 990
4	18 898
5	17 931
	92,242
	÷ 5
Avg.	18448 cpm

REMARKS: All readings < 2 times BKG
Sample ID # 990817604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: R [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 17	Time: 1700	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 14 East Confirmatory Survey

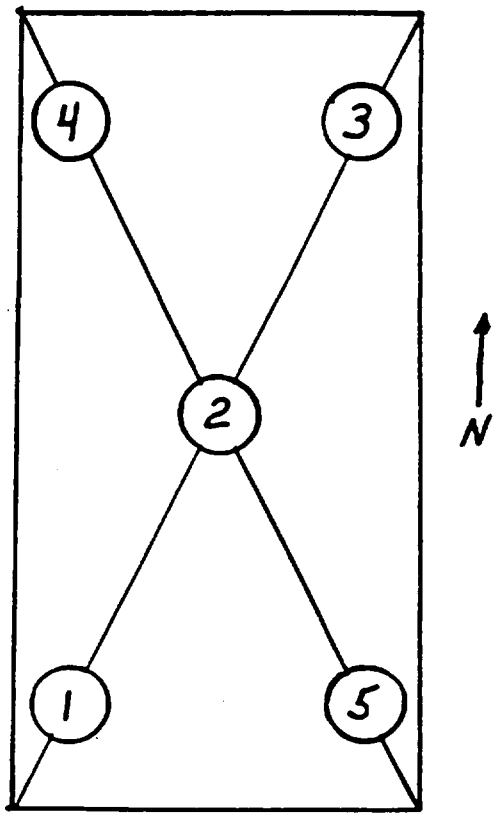
Bicron analyst # A2282
" G-5 # B 588M

Cal. Due 5/14/00

SKETCH:

Bkgd	18256 cpm
walkover	17-21,000 cpm
# 1	15039 cpm
# 2	19635 cpm
# 3	17726 cpm
# 4	17125 cpm
# 5	15265 cpm

84,790 cpm
÷ 5
avg. 16,958 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 99081760~~4~~5 RL 11/3/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D Jenkins /

Reviewed by: R Jenenberg

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 17	Time: 17:50	Page 1 of
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

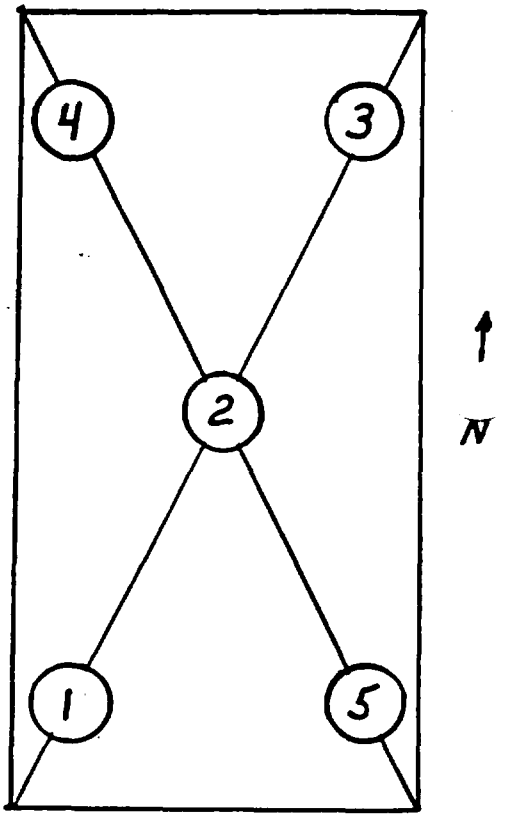
LOCATION: 24 East Confirmatory Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	20104 cpm
walkover	18000 - 27000 cpm
# 1	17554 cpm
# 2	18341 cpm
# 3	18866 cpm
# 4	24585 cpm
# 5	14741 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990817606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 1001

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

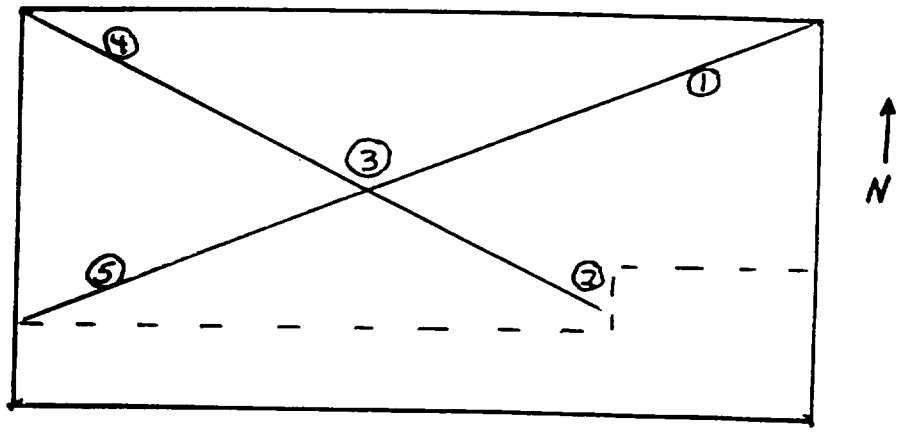
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 18	Time: 1045	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: 107 Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



Bkgd	22562	cpm
walkover	20K TO 25K	cpm
#1	19737	cpm
#2	17702	cpm
#3	15923	cpm
#4	20377	cpm
#5	21005	cpm

REMARKS: GRID 107
All readings < 2 times Bkg
Sample ID # 990818602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zemberg Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

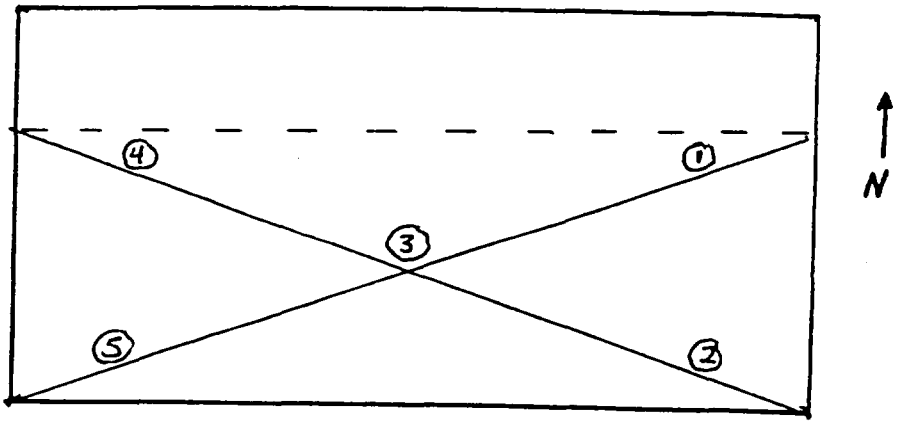
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 18	Time: 1120	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

LOCATION: 106 Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



BKgd 20153 cpm
walkover 16K TO 24K cpm
#1 25169 cpm
#2 16488 cpm
#3 16766 cpm
#4 14338 cpm
#5 15096 cpm

REMARKS: GRID 106
All readings < 2 times BKG
Sample ID # 990818601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Greenberg Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 18	Time: 1202	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

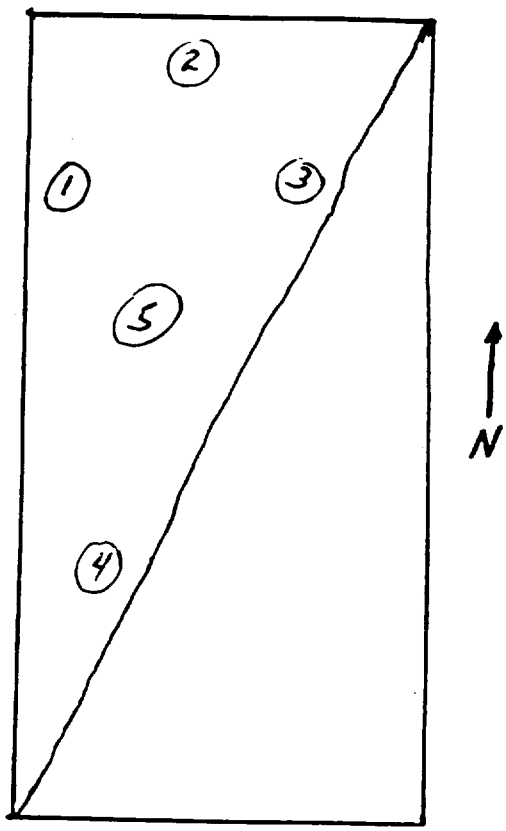
LOCATION: ~~12 36~~ N.W. 1/2 of 36W Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	22710	cpm
walkover	20000-27000	cpm
# 1	21004	cpm
# 2	20634	cpm
# 3	20169	cpm
# 4	18657	cpm
# 5	18522	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990818603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 1100141

Reviewed by: R. [illegible] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

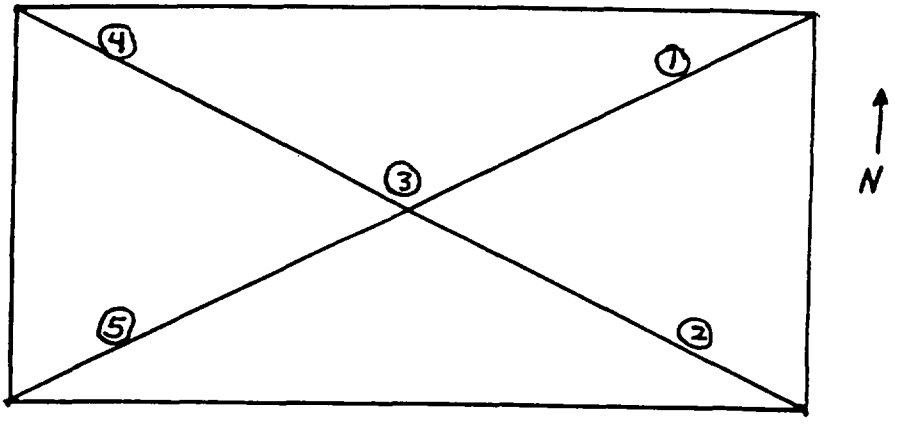
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 18	Time: 1515	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRIDS 104 + 105 Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



Bkgd	19393	cpm
walkover	15K to 22K	cpm
#1	16017	cpm
#2	15908	cpm
#3	15233	cpm
#4	23107	cpm
#5	16502	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990818605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 18	Time: 1620	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

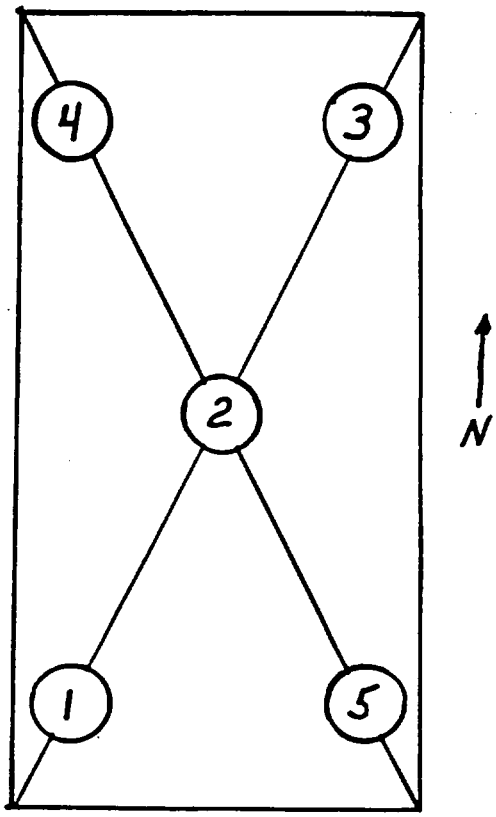
LOCATION: Grid 35 East Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd 24615 cpm
walkover 18-34,000* cpm
1 21858 cpm
2 18827 cpm
3 21552 cpm
4 DRS 8/18/99 ~~18827~~ 27387 cpm
5 20685 cpm



Sample ID #990818606 R2 11/3/99

REMARKS: * 34,000 cpm reading was in corner by 4. Reading at ~3' from ground was 35,000 cpm. Reading against ~~was~~ wall was 80,000 cpm.
All readings < 2 times Background

JRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 19	Time: 0820	Page ___ o
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

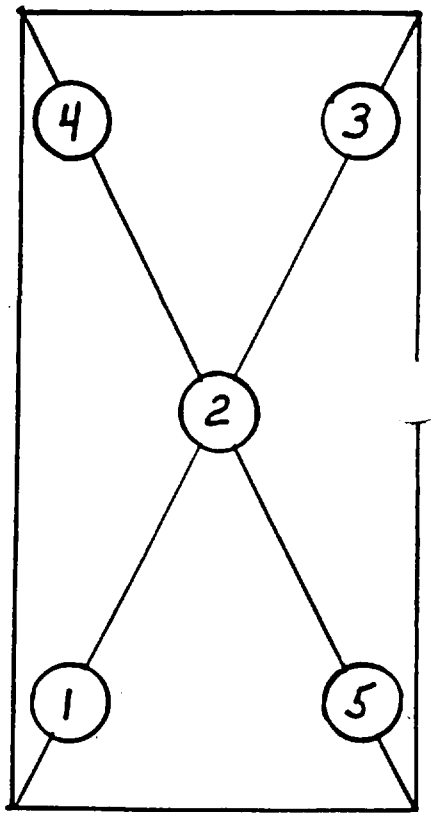
LOCATION: Grid 44 West Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	26,500	cpm
walkover	28-48,000*	cpm
# 1	23,068	cpm
# 2	21,751	cpm
# 3	21,732	cpm
# 4	27,311	cpm
# 5	19,717	cpm



Sample ID# 990819601
990819602 Dup

All readings < 2 times Background

REMARKS: *48,000 cpm reading was in NW corner above (4). AT 3' above grade reading was 51,000 cpm. Elevated reading appeared to be due to material in excavation face next to N and W sides of grid corner. Released area was moved slightly (~2 ft) from N boundary to ensure no material was in grid.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Zerenberger Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

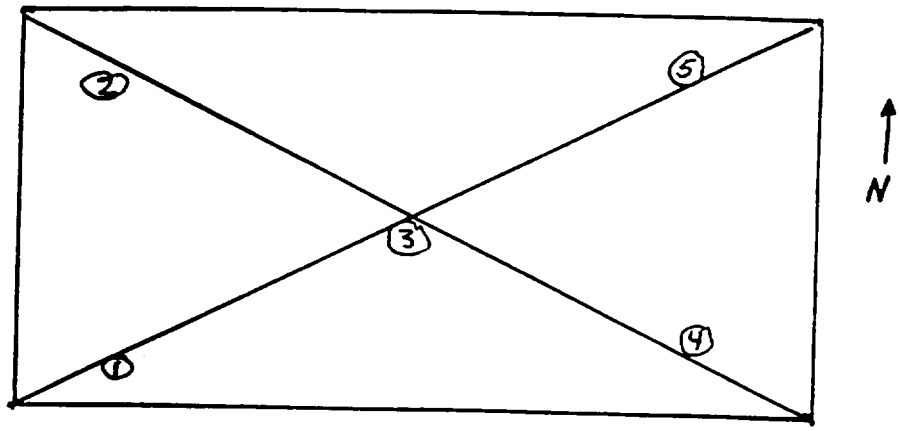
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 19	Time: 1000	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRIDS 102-103 Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



Bkgd	25153	cpm
walkover	16K TO 31K	cpm
#1	15865	cpm
#2	14545	cpm
#3	25424	cpm
#4	18884	cpm
#5	31060	cpm

REMARKS: All readings < 2 times Background
Sample ID # 990819603

COUNTY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] / —

Reviewed by: [signature] Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 19	Time: 1130	Page [illegible] c
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

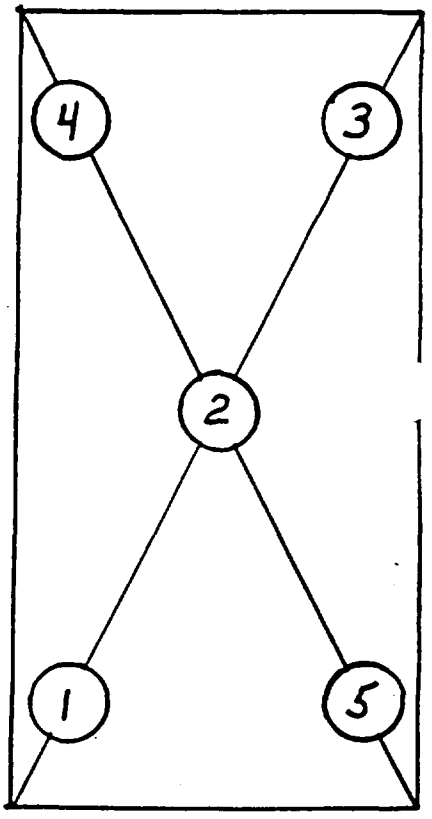
LOCATION: Grid 29 E Confirmatory Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	21959 cpm
walkover	20-27,000* cpm
# 1	19973 cpm
# 2	20201 cpm
# 3	20950 cpm
# 4	20959 cpm
# 5	17757 cpm



REMARKS: *27,000 cpm reading near w center of 29 East. Apparently material in excavation face.
All readings < 2 times Background
Sample ID # 990819604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R. Muenberger

Date: 8/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

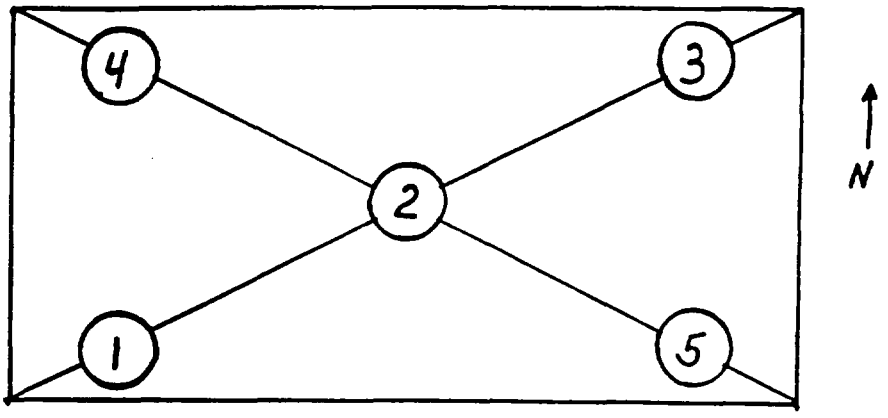
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 19	Time: 1520	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 13 Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5/14/00

SKETCH:



Bkgd 14,429 cpm
walkover 10-18,000 cpm
#1 12981 cpm
#2 13520 cpm
#3 13651 cpm
#4 16983 cpm
#5 13036 cpm

REMARKS: All readings < 2 times BKG
Sample ID # 990819605

SU / TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D Jenkins / D Jenkins /

Reviewed by: K Thunberg Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

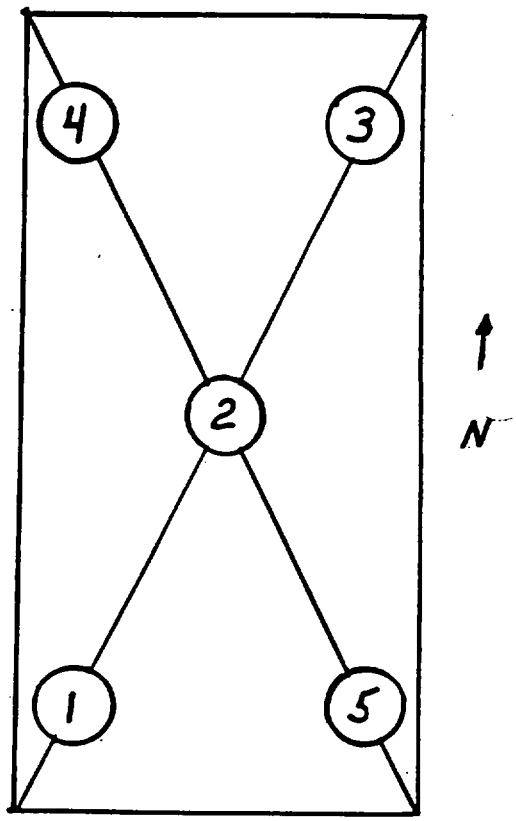
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 19	Time: ~~1350~~ 1550 DAS 8/19/99	Page 1 of —
RWP No. 99003	WORK ORDER No.	BLDG. No.	

LOCATION: Grid 14W Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M
Cal. Due 5/14/00

SKETCH:

Bkgd 18,149 cpm
walkover 16-23,000 cpm
1 12,368 cpm
2 17171 cpm
3 18219 cpm
4 17119 cpm
5 17416 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990819606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeenberger Date: 8/26/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 8/23/99 – 8/28/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
24 W	8/23/99	<2 X Bkg	2.2	
29 W	8/23/99	<2 X Bkg	2.6	
35 W	8/24/99	<2 X Bkg	1.9	
45 E	8/24/99	<2 X Bkg	2.5	
16 E	8/24/99	<2 X Bkg	2.7	
23 E	8/27/99	<2 X Bkg	2.7	
39/40	8/27/99	<2 X Bkg	1.6	
2/3	8/27/99	<2 X Bkg	1.5	
4 N	8/27/99	<2 X Bkg	2.0	
30 E	8/27/99	<2 X Bkg	2.2	
1 N	8/27/99	<2 X Bkg	2.6	
4 S	8/27/99	<2 X Bkg	2.0	
45 W	8/28/99	<2 X Bkg	2.2	
34 E	8/28/99	<2 X Bkg	2.1	
53 E	8/28/99	<2 X Bkg	2.2	
53 W	8/28/99	<2 X Bkg	2.3	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
2) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 23	Time: 1045	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

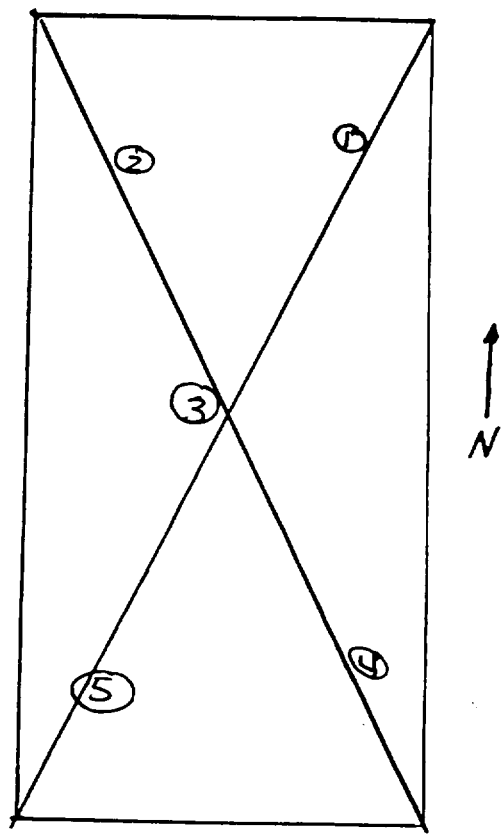
LOCATION: GRID 24 W Confirmation Survey

Bicron analyst # A228Z
" G-5 # B558M

Cal. Due 5-14-00

SKETCH:

Bkgd	19056	cpm
walkover	18K-22K	cpm
# 1	18112	cpm
# 2	19644	cpm
# 3	17203	cpm
# 4	17320	cpm
# 5	16715	cpm



REMARKS: All readings <2 times BKG
Sample ID # 990823601

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: R [signature] Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 23	Time: 1350	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

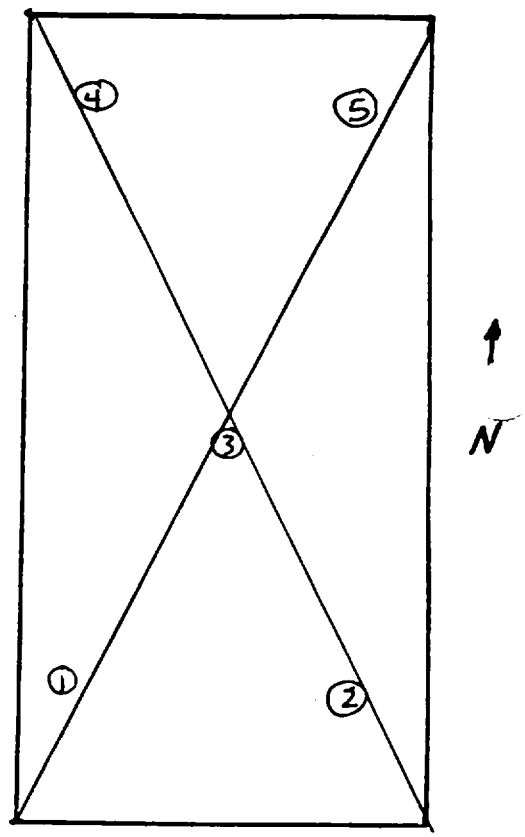
LOCATION: GRID 29 W Confirmation Survey

Bicron analyst # A228Z
" G-5 # B558M

Cal. Due 5-14-00

SKETCH:

Bkgd	21857	cpm
walkover	21K to 25K	cpm
# 1	19968	cpm
# 2	18219	cpm
# 3	20710	cpm
# 4	20084	cpm
# 5	19284	cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990823602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zenenberger Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

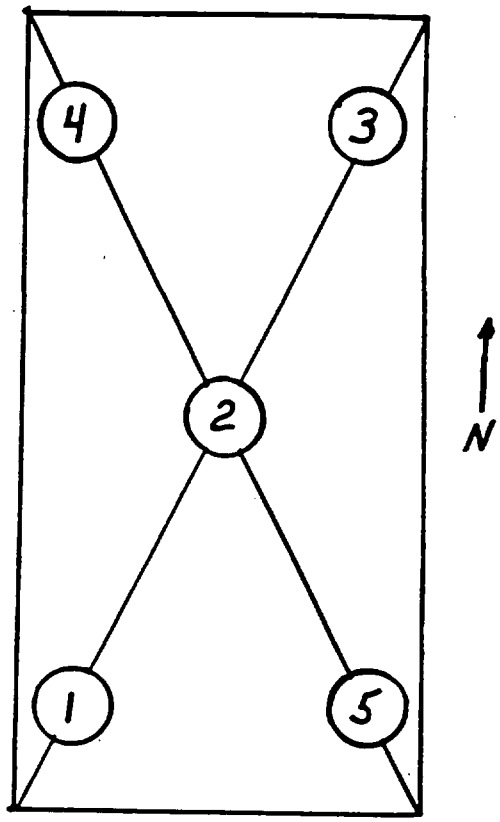
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 24	Time: 1205	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 35 West Confirmation Survey

Bicron analyst # B 4416
" G-5 # B668Y
Cal. Due 5/14/00

SKETCH:

Bkgd 24,283 cpm
walkover 21-32,000 cpm
1 20,925 cpm
2 16,763 cpm
3 15,645 cpm
4 19,737 cpm
5 17,793 cpm



REMARKS: All readings < 2 times BKG
Sample ID # 990824601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R. Humberson Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 98 Mo 8 Dy 24	Time: 1320	Page 1 of —
RWP No. 9900 3	WORK ORDER No. N/A	BLDG. No. N/A	

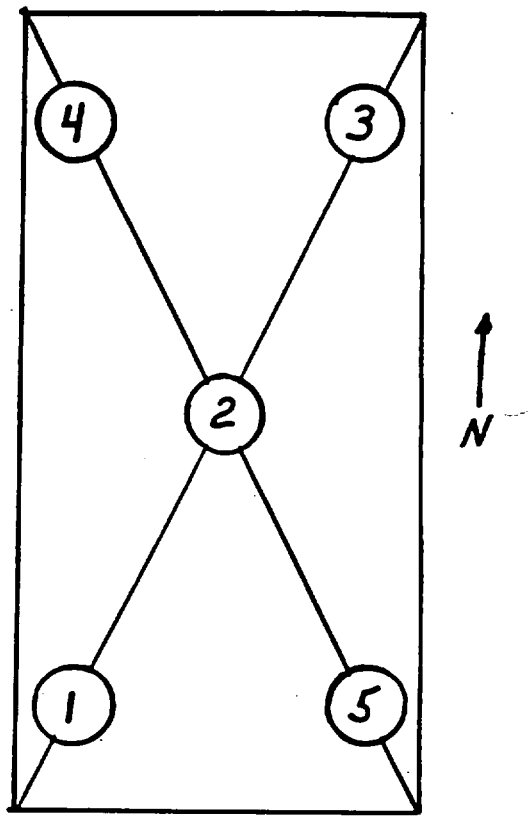
LOCATION: Grid 45 East Confirmation Survey

Bicron analyst # ~~A2282~~ B441G
" G-5 # B668V DRS 8/24/99

Cal. Due 5/14/00

SKETCH:

Bkgd	24,956	cpm
walkover	20-40,000 *	cpm
# 1	19616	cpm
# 2	20309	cpm
# 3	22071	cpm
# 4	28832	cpm
# 5	18633	cpm



REMARKS: * Near walls on North and West sides by 4.
North Wall reading 50,000 cpm. West Wall reading 70,000 cpm.
Sample ID # 990824602
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zumberge Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 24	Time: 1545	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 16 East Confirmation Survey

Bicron analyst # B441 G
" G-5 # B668 V

Cal. Due 5/14/00

SKETCH:

Bkgd 17,954 cpm

walkover 19-23,000 cpm

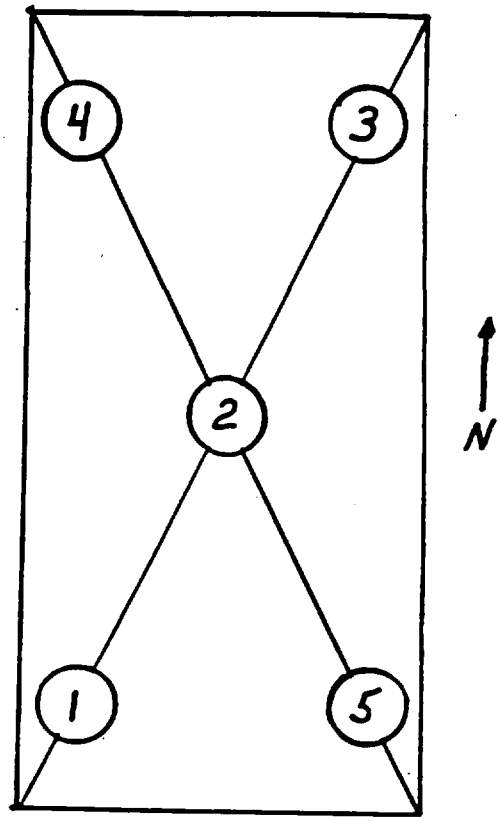
1 15,876 cpm

2 16,717 cpm

3 16,821 cpm

4 18,180 cpm

5 16,404 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990824603

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

/ / / /

Reviewed by: R Humphreys Date: 8/26/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1305	Page 1 of ~
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 23 East Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5/14/00

SKETCH:

Bkgd 17859 cpm

walkover 14-20,000 cpm

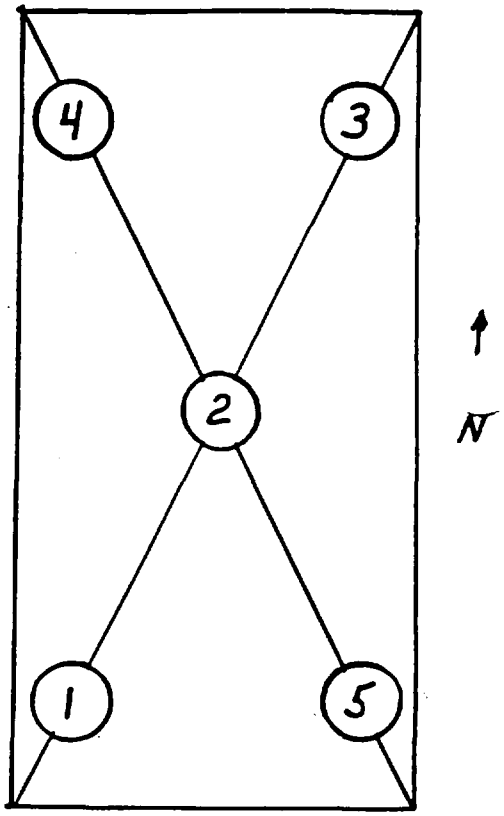
1 - 16450 cpm

2 15849 cpm

3 16242 cpm

4 17807 cpm

5 15897 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990827601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

/ / / /

Reviewed by: K. Jennings Date: 8/28/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

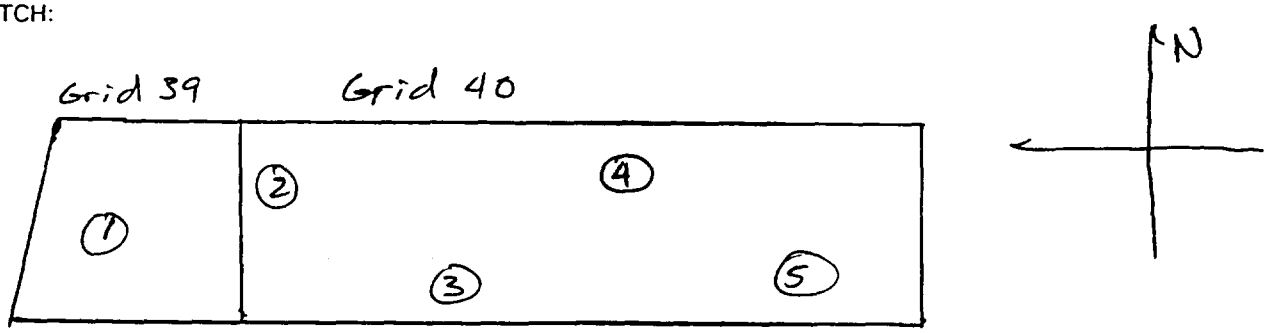
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1420	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 39/40 South Confirmatory Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION ☐ = AIR SAMPLE LOCATION

DRW 8/27/99

SKETCH:



Bicron analyst: B441G
GS: B668V
cal due: 5/14/00

BKG 12015 cpm
Walkover 10-15,000 cpm
#1 11504 cpm
#2 11663 cpm
#3 11294 cpm
#4 12038 cpm
#5 10846 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990827603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D Jenkins / D. Jenkins /

Reviewed by: R Henderson Date: 8/28/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

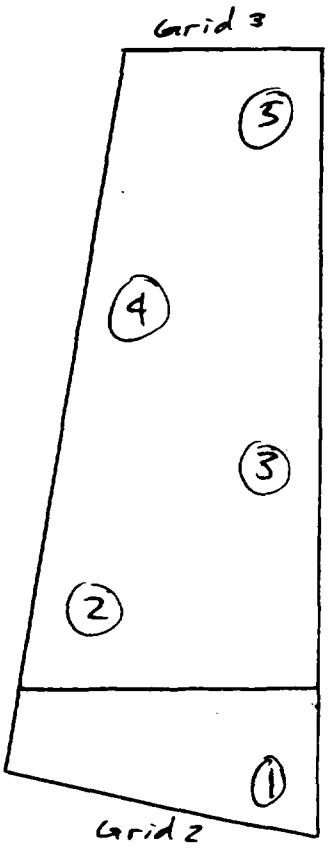
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1505	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 2/3 Confirmatory Survey

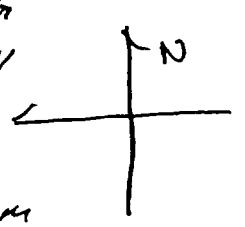
MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION DRS 8/27/99 ☐ = AIR SAMPLE LOCATION

SKETCH:



Bicron analyst: B441G
G5: B668V
cal due: 5/14/00
Bkg 11 918 cpm
Walkover 10-14,000 cpm

#1 10,552
#2 11,200
#3 12,094
#4 10,913
#5 10,661



REMARKS: All readings < 2 times Bkg
Sample ID # 990827603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Lauenberger Date: 8/28/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

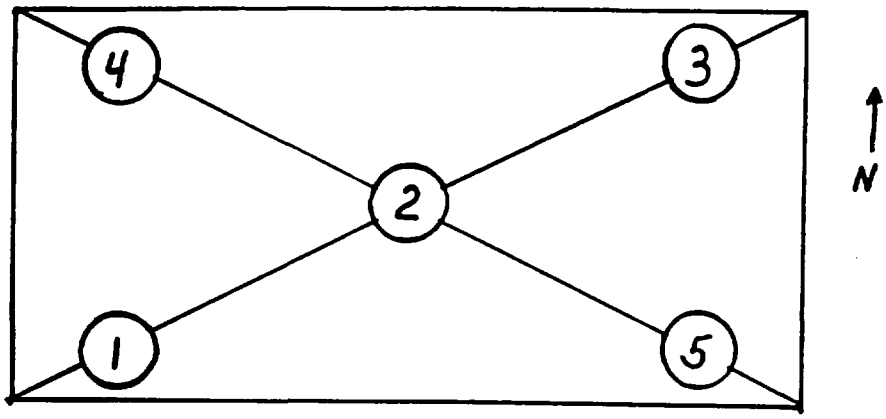
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1610	Page 1 of
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 4 North Confirmatory Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5/14/00

SKETCH:



Bkgd	11,504	cpm
walkover	10-15,000	cpm
#1	12445	cpm
#2	11436	cpm
#3	11 932	cpm
#4	11 762	cpm
#5	10572	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990827605

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zwenberg

Date: 8/28/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 27	Time: 1635	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

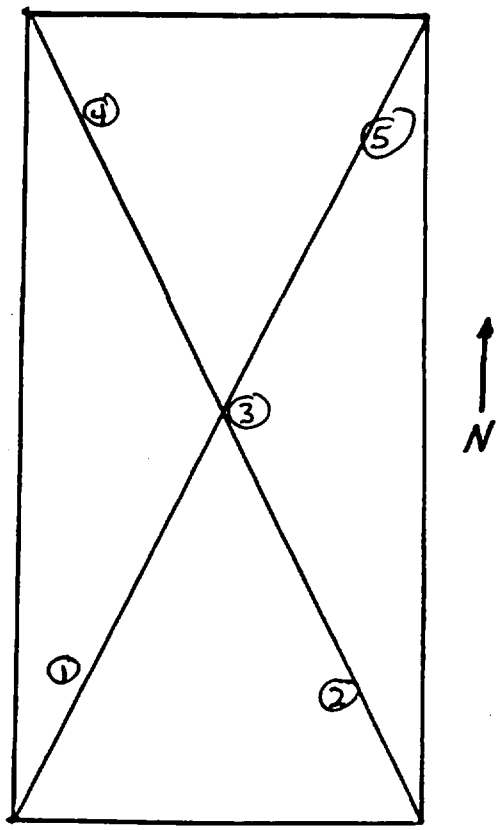
LOCATION: GRID 30E Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	21096	cpm
walkover	18K TO 24K	cpm
# 1	17623	cpm
# 2	20283	cpm
# 3	18929	cpm
# 4	21645	cpm
# 5	19737	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990827604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: R Unenberg Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

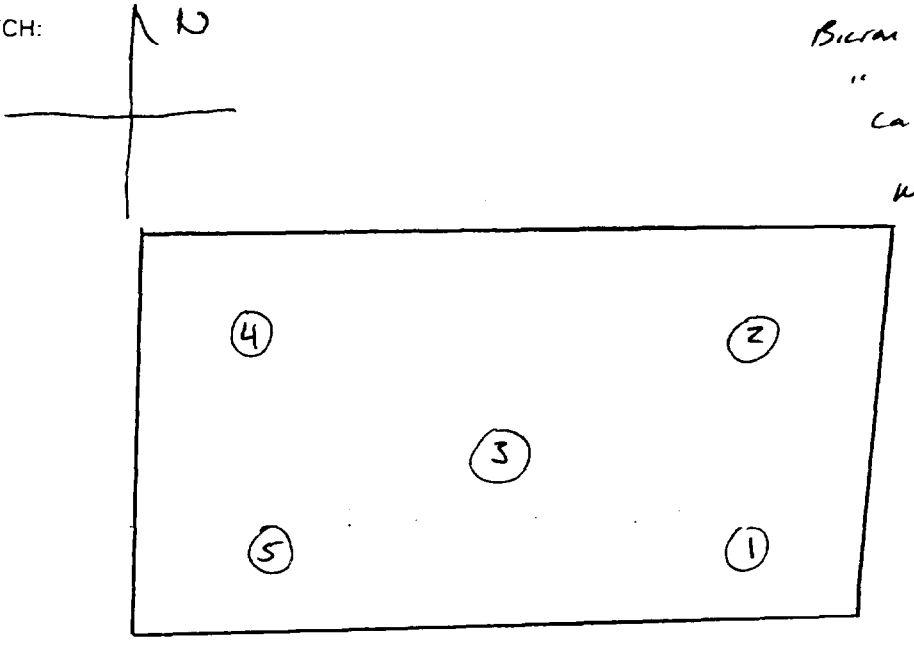
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1700	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 1 North Confirmation Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION DNS 8/27/99 ☐ = AIR SAMPLE LOCATION

SKETCH:



Bicron analyst B441G
" GS B668V
cal due 5/14/00
BKG 11,508 cpm
walkover 9-14,000 cpm
One minute readings (cpm)

1	15,152
2	13,398
3	11,566
4	9,730
5	9,827

REMARKS: All readings < 2 times BKG
Sample ID # 990827606

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zimmerberger Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

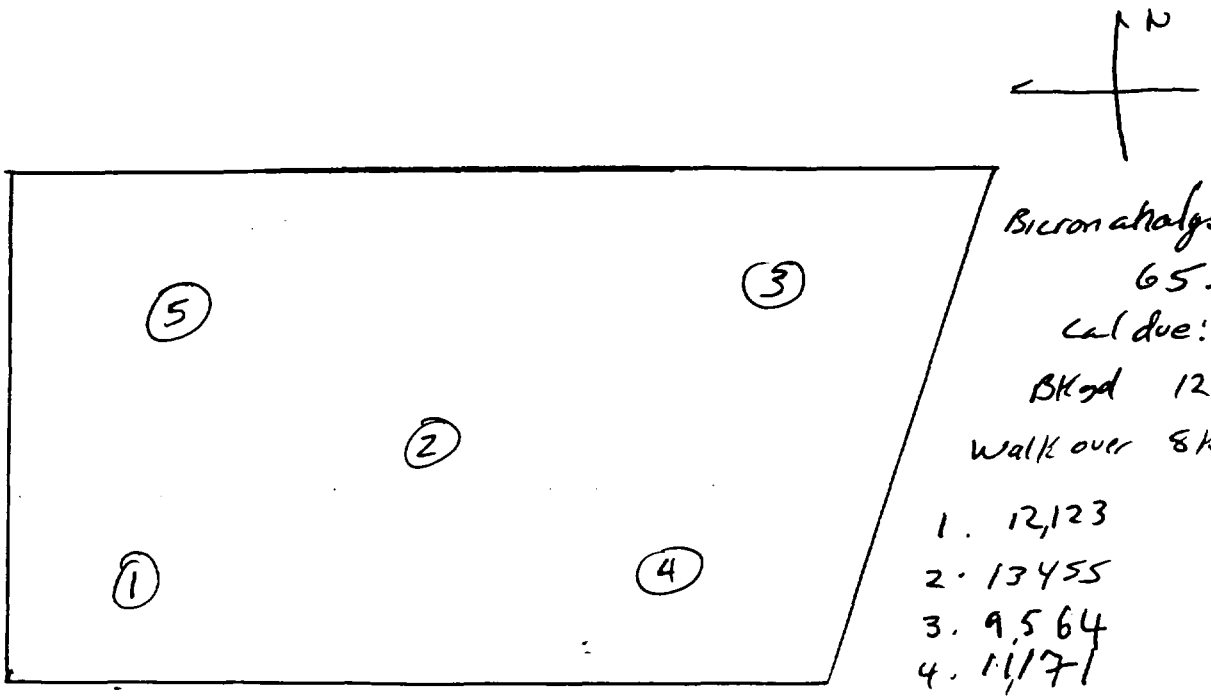
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 27	Time: 1730	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid ~~44 S~~ DW 8/27/99 4 South Confirmatory Survey

MAP KEY: ○ = ~~SMEAR / LARGE AREA WIPE~~ Sample LOCATION DW 8/27/99 ☐ = AIR SAMPLE LOCATION

SKETCH:



Bicron analyst: B4416
65: B668V
Cal due: 5/14/00
BKgd 12,255
Walk over 8K-16K

1. 12,123
2. 13455
3. 9,564
4. 11,171
5. 13024

REMARKS: All readings < 2 times BKg
Sample ID # 990827607

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /
DAVID SATH / Dal Sat /

Reviewed by: R Tenenberger Date: 8/28/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 28	Time: 0905	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

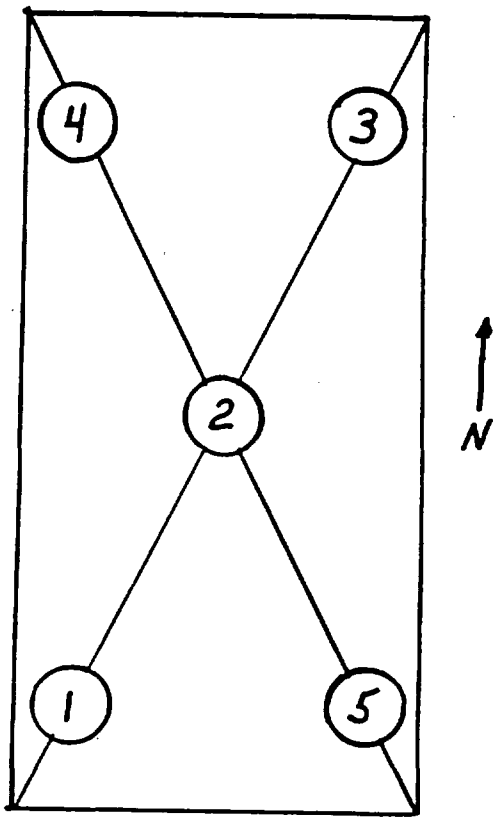
LOCATION: Grid 34 East Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	25,380 cpm
walkover	20-43,000 cpm
# 1	22,276 cpm
# 2	19,733 cpm
# 3	22,086 cpm
4	25,979 cpm
# 5	18,944 cpm



REMARKS: High background area along west and North walls. Countrate did not decrease when detector was raised to 4 ft from grade. All readings < 2 times Bkg
Sample ID# 990828601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Thornberger Date: 8/31/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy ~~99~~ 28	Time: 1400	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA

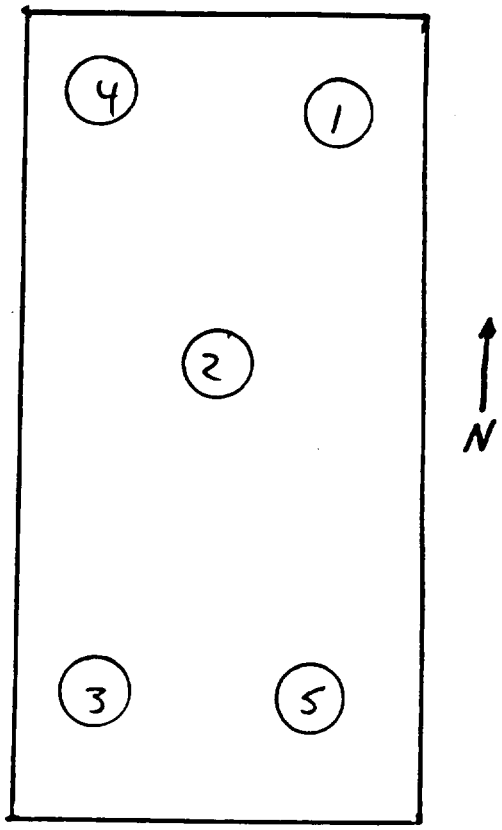
LOCATION: GRID 53 west Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V
Cal. Due 5-14-00

◯ = 1 minute counts of sample location

SKETCH:

Bkgd 16 K cpm
walkover 13K - 21K cpm
1 14011 cpm
2 14400 cpm
3 14756 cpm
4 14999 cpm
5 14911 cpm



REMARKS: Confirmation Survey
* All Readings < 2x Bkgd
Sample ID # 990828603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID EATON / David Eat / 100163

Reviewed by: [signature] Date: 8/31/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

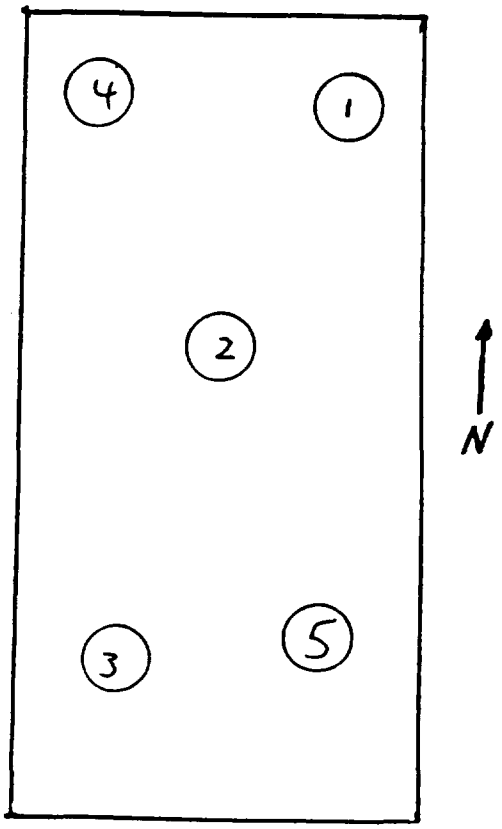
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 28	Time: 1400	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: GRID 53 E Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V
Cal. Due 05-14-00

SKETCH:

Bkgd	16 K	cpm
walkover	13K - 20 K	cpm
# 1	15301	cpm
# 2	14590	cpm
# 3	15116	cpm
4	14908	cpm
# 5	16001	cpm



REMARKS: Confirmation Survey
* All Readings < 2xBkgd
Sample ID # 990828602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID EATON / Dd Et / 100163

Reviewed by: R Zenenberg

Date: 8/31/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

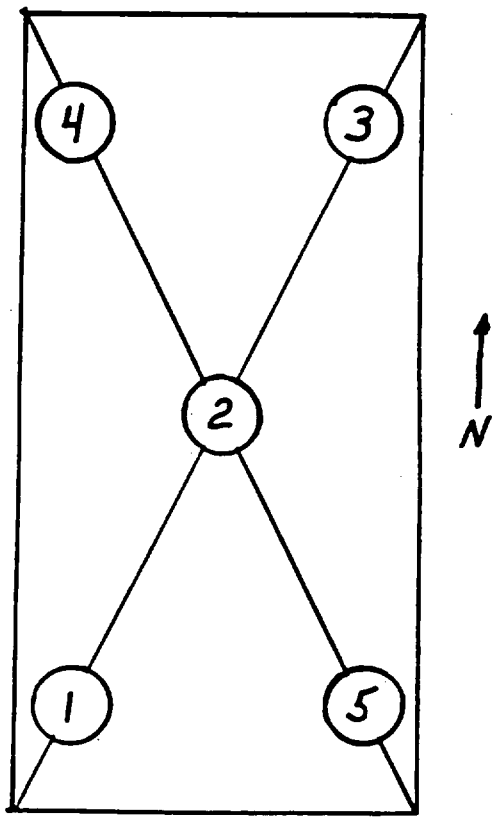
SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 28	Time: ~~1445~~ 1545	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A 8/28/99	

LOCATION: Grid 45 West Confirmation Survey

Bicron analyst # A2282
" G-5 # B588A
Cal. Due 5/14/00

SKETCH:

Bkgd 26,914 cpm
walkover 20-42,000 cpm
1 20,118 cpm
2 21,269 cpm
3 22,937 cpm
4 29,587 cpm
5 17,373 cpm



Sample ID # 990828604, 990828605 Dup

REMARKS: At north line and west line, background ranged from 30-40,000 cpm due to excavation walls. Count rate did not significantly change when detector was raised from 6 inches to 4 ft.
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by R Zeuenbergen Date: 8/31/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 8/30/99 – 9/3/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results[2] (pCi/g; Ra-226&Ra-228)**	**Comments**
52 South	8/30/99	<2 X Bkg	2.8	
52 North	8/30/99	<2 X Bkg	5.2	
15	8/30/99	<2 X Bkg	1.9	
16 West	8/30/99	<2 X Bkg	2.3	
23 West	8/30/99	<2 X Bkg	2.3	
30 West	8/31/99	<2 X Bkg	2.1	
34 West	8/31/99	<2 X Bkg	2.0	
51 East	9/1/99	<2 X Bkg	3.3	
18 East	9/1/99	<2 X Bkg	3.3	
22 East	9/2/99	<2 X Bkg	2.5	
46 East	9/2/99	<2 X Bkg	2.2	
31 East	9/2/99	<2 X Bkg	2.3	
56	9/3/99	<2 X Bkg	2.4	
100 North	9/3/99	<2 X Bkg	8.1	
101 South	9/3/99	<2 X Bkg	2.6	
33 East	9/3/99	<2 X Bkg	2.0	
18 West	9/3/99	<2 X Bkg	2.5	
17	9/3/99	<2 X Bkg	2.1	

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

Area Contamination

Elevated scan readings (i.e., > 2 times Bkg, measured with a Fidler) have been measured on the north section of Grid 101. The locations of these elevated readings has been marked (i.e., orange paint) and will be remediated at a later time.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

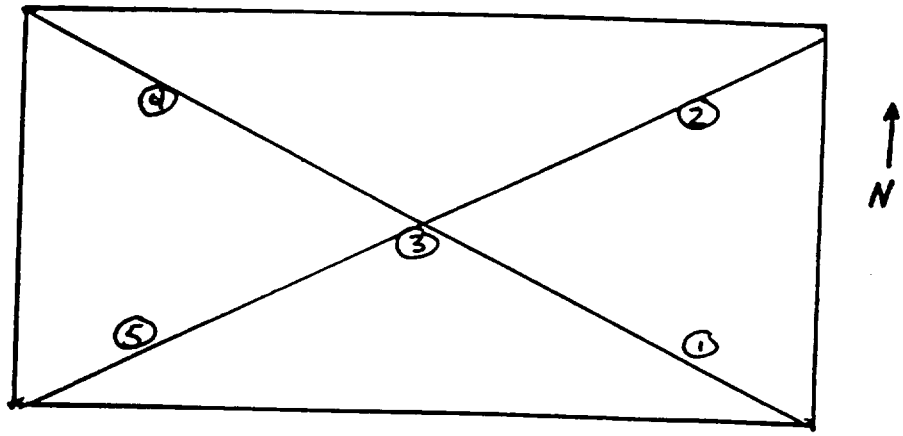
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 30	Time: 0945	Page 1 of 1
RWP No. 99-003	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 52 SOUTH Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



Bkgd 15680 cpm
walkover 12K To 18K cpm
#1 17162 cpm
#2 14481 cpm
#3 15334 cpm
#4 15290 cpm
#5 15064 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990830601

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F L /

Reviewed by: [signature] Date: 8/31/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

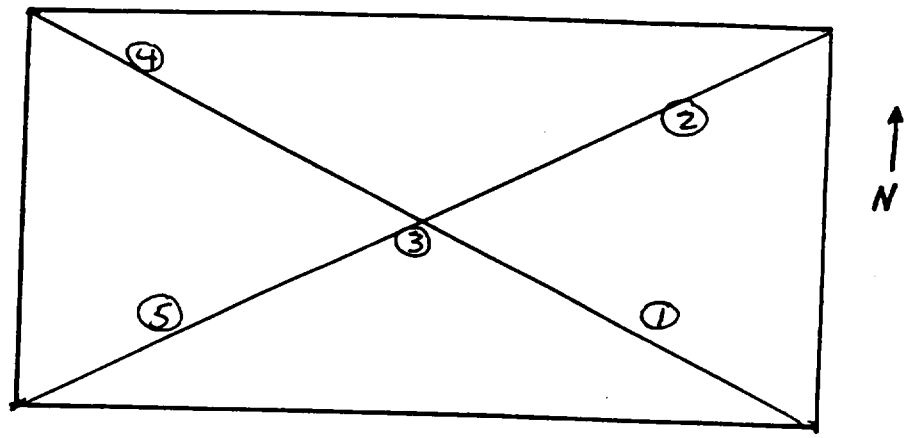
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 30	Time: 1030	Page 1 of 1
RWP No. 99-003	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 52 NORTH Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal Due 5-14-00

SKETCH:



Bkgd 19169 cpm
walkover 15K TO 30K cpm
#1 15682 cpm
#2 27203 cpm
#3 16170 cpm
#4 16210 cpm
#5 17360 cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990830602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis / —

Reviewed by: d Hunnberger

Date: 8/31/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

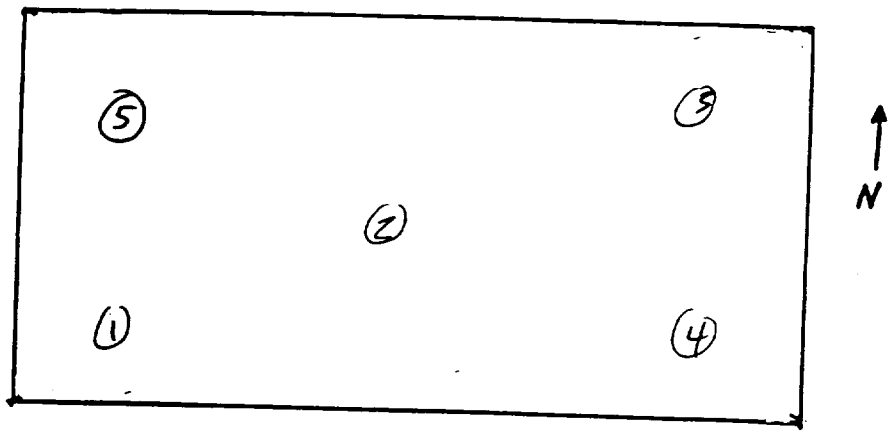
E: MILLENIUM	DATE: Yr 99 Mo 8 Dy 30	Time: 1410	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. NA	

LOCATION: Grid 15 Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5/14/00

SKETCH:



Bkgd	16,250	cpm
walkover	13-18,000	cpm
#1	14,670	cpm
#2	15,726	cpm
#3	16,012	cpm
#4	12,930	cpm
#5	15,678	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 990830603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 30	Time: 1450	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

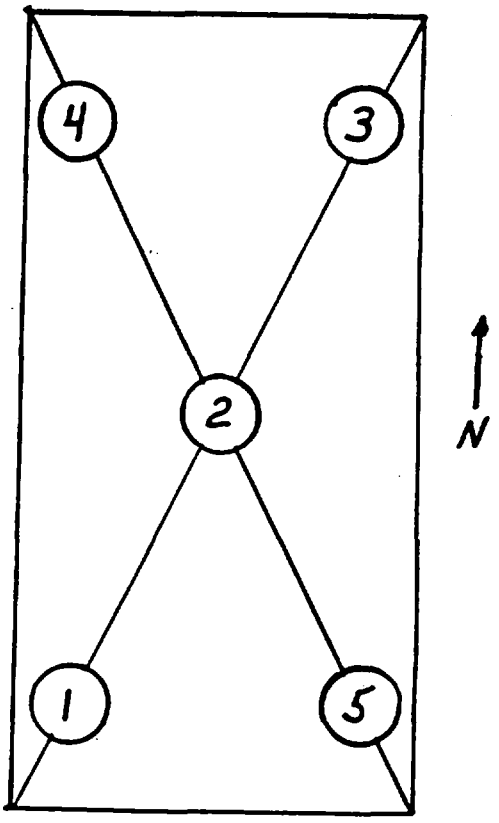
LOCATION: Grid 16 West Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd 17,744 cpm
walkover 14-20,000 cpm
1 15,736 cpm
2 16,384 cpm
3 16,080 cpm
4 16,705 cpm
5 15,449 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990830604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Kuenberger Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 30	Time: 1700	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

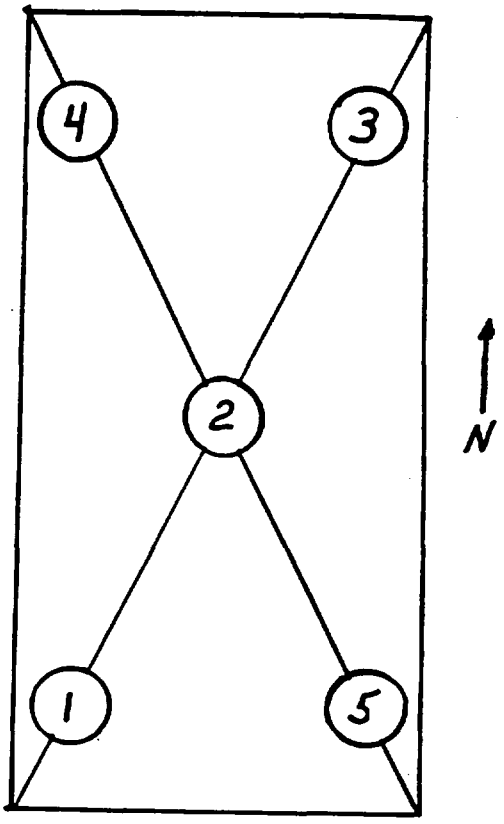
LOCATION: Grid 23 West Confirmation Survey

Bicron analyst # A228 Z
" G-5 # B588 M

Cal. Due 5/14/00

SKETCH:

Bkgd	20,270 cpm
walkover	17-22,000 cpm
# 1	16,818 cpm
# 2	17,111 cpm
# 3	18,579 cpm
# 4	19,216 cpm
# 5	16,489 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990830605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D Jenkins / D. Jenkins /

Reviewed by: R Unenberg Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 31	Time: 1330	Page 1
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

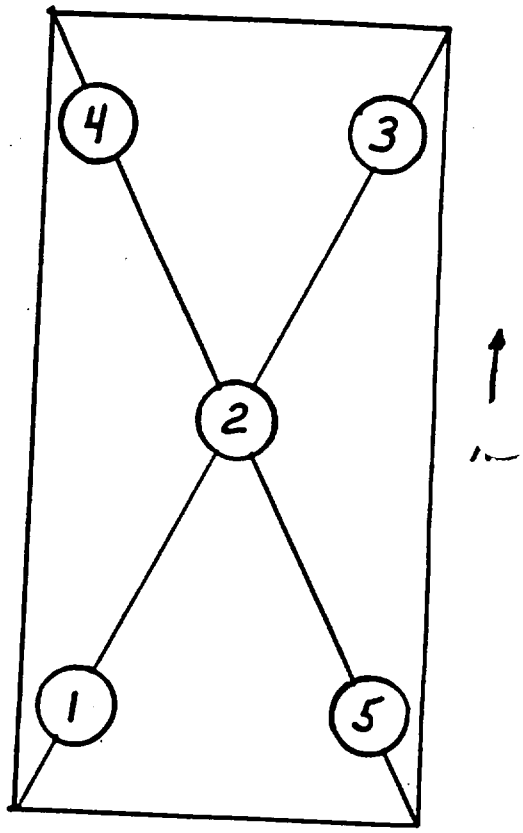
LOCATION: Grid 30 West Confirmation Survey

Bicron analyst # A2282
" G-5 #

Cal. Due

SKETCH:

Bkgd	21,432 cpm
walkover	20-30,000* cpm
# 1	17,481 cpm
# 2	18,633 cpm
# 3	19,902 cpm
# 4	22,210 cpm
# 5	17,795 cpm



REMARKS: High reading of 30,000 cpm along west wall of excavation. No change between 6" and 4' height of detector. All readings 1-2 times Bkg
Sample ID # 990831601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: [signature] Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 8 Dy 31	Time: 1640	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

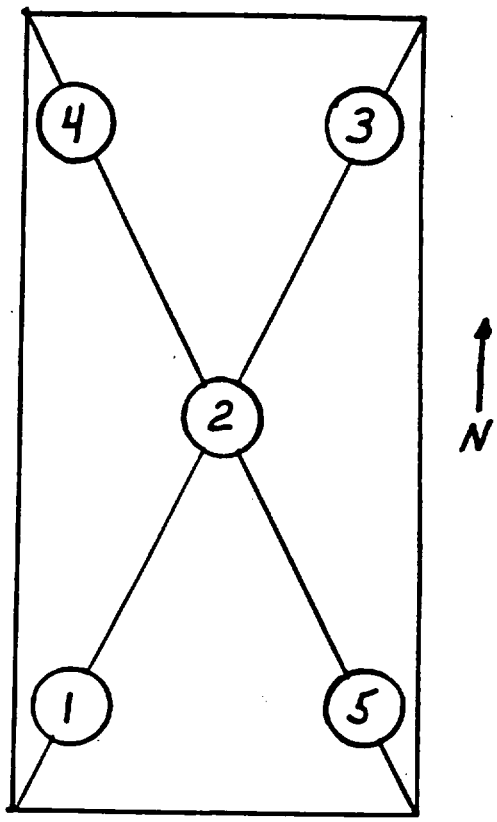
LOCATION: Grid 34 West Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd 26,466 cpm
walkover 22-40,000 cpm
1 23,309 cpm
2 18,843 cpm
3 21,399 cpm
4 29,758 cpm
5 18,843 cpm



REMARKS: All readings < 2 times BKg
Sample ID # 990831602

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Zumberg Date: 9/1/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 01	Time: 1015	Page 1 of
RWP No. 99-003	WORK ORDER No. —	BLDG. No. —	

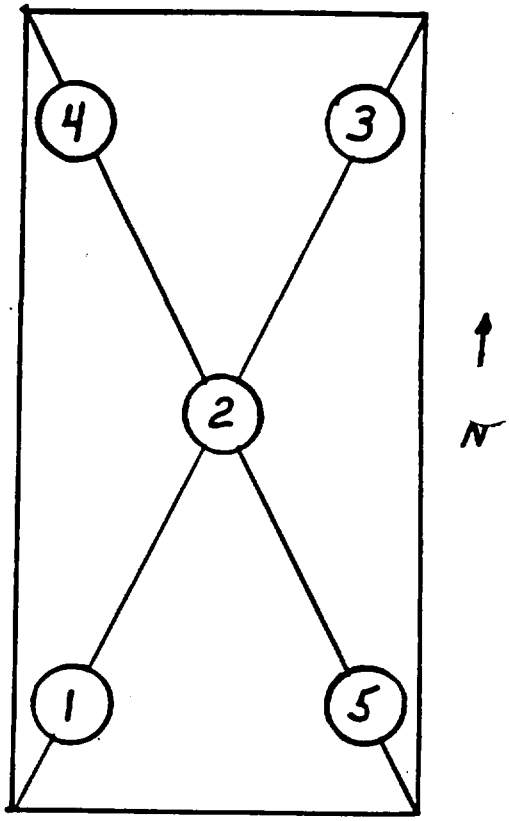
LOCATION: GRID 51 EAST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	17252 cpm
walkover	14 K TO 25 K cpm
# 1	15068 cpm
# 2	16500 cpm
# 3	15975 cpm
# 4	16400 cpm
# 5	22077 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990901601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 9 Dy 1	Time: 1445	Page 1 of ___
RWP No. 9900 3	WORK ORDER No. N/A	BLDG. No. N/A	

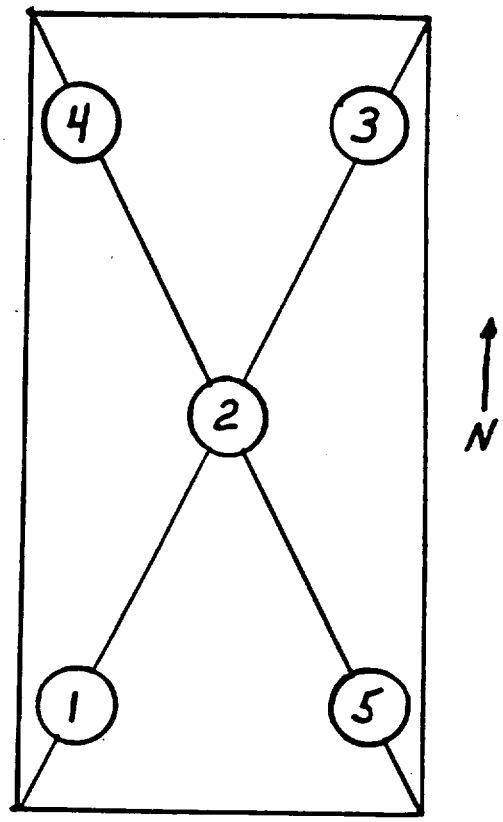
LOCATION: Grid 18 East Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	17,751 cpm
walkover	15-20,000 cpm
# 1	15,475 cpm
# 2	16,486 cpm
# 3	16,657 cpm
# 4	17,613 cpm
# 5	15,804 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990901602

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Tenenberg

Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

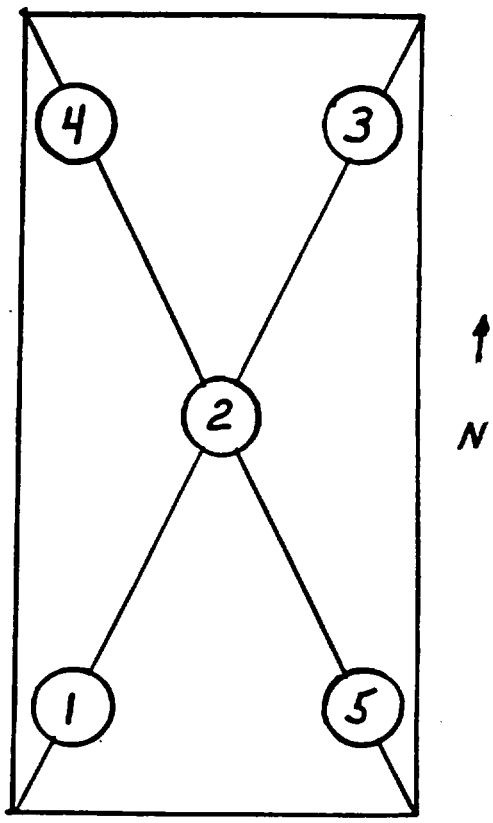
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 02	Time: 0845	Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 22 east Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M
Cal. Due 5/14/00

SKETCH:

Bkgd 20,073 cpm
walkover 18-24,000 cpm
1 18,002 cpm
2 17,892 cpm
3 18,298 cpm
4 20,213 cpm
5 16,492 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990902601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Jennings

Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 02	Time: 1015	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

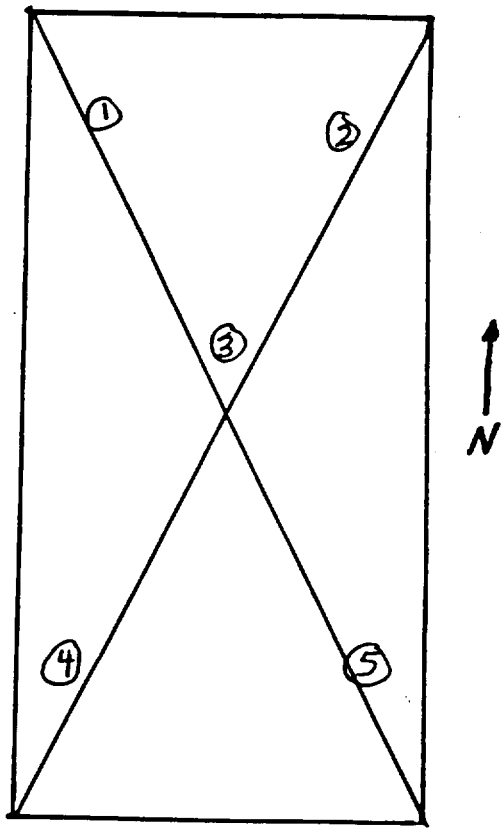
LOCATION: GRID 46 EAST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	21062 cpm
walkover	20K TO 30K cpm
# 1	26889 cpm
# 2	18443 cpm
# 3	20187 cpm
# 4	21434 cpm
# 5	16898 cpm



REMARKS: All readings < 2 times Bkg
Sample ID #990962602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zimmerberg Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

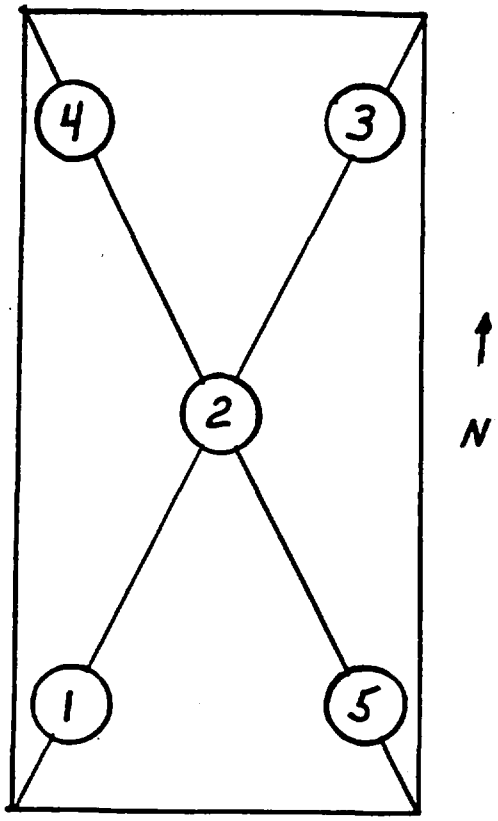
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 02	Time: 1345	Page 1 of —
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 31 East Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M
Cal. Due 5/14/00

SKETCH:

Bkgd	21,834 cpm
walkover	18-28,000* cpm
# 1	17,783 cpm
# 2	17,988 cpm
# 3	19,299 cpm
# 4	22,961 cpm
# 5	16,935 cpm



Sample ID # 990902603

REMARKS: *28,000 cpm count along NW corner of grid. No change from ground level reading to 3' above ground. High Countrate due to material in west wall.
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Lemmberg Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 03	Time: 0945 Page 1 of
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A

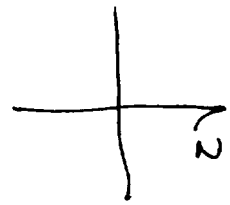
LOCATION: Grid 56 Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

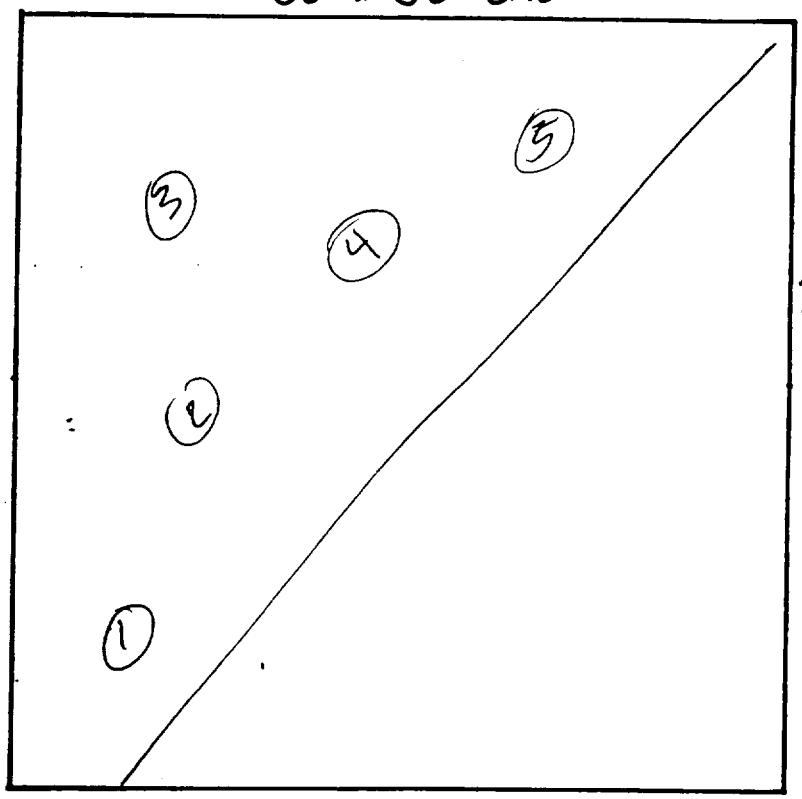
Cal. Due 5/14/00

SKETCH:

Bkgd 16697 cpm
walkover 16-~~20,000~~ 19000 cpm
#1 15124 cpm
#2 15814 cpm
#3 16470 cpm
#4 16543 cpm
#5 16443 cpm



50' x 50' Grid



9/7/99

REMARKS: All readings L 2 times BKG
Included in the walkover survey is the area to the floodplain DRS 9/29/99
Sample ID # 99090360I

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zumbrum Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

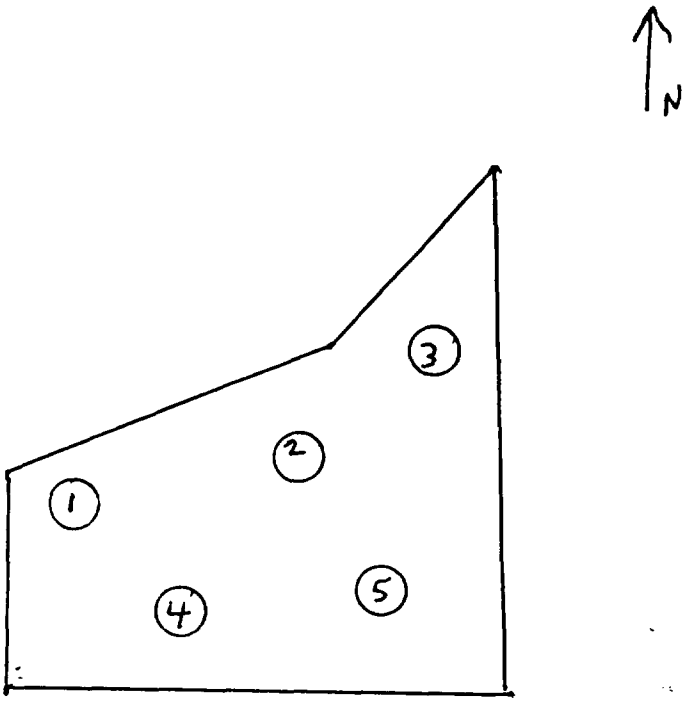
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 03	Time: 1230	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: GRID 101 South

MAP KEY: ~~⊖ = SMEAR / LARGE AREA WIPE LOCATION~~ D.E ~~□ = AIR SAMPLE LOCATION~~ D.E

○ = 1 minute counts At sample location

SKETCH: Confirmation Survey



Bkgd 17K

walk over 15-23 K

#1 18,006

#2 16,041

#3 17,151

#4 17,512

#5 20,111

Inst. Bicron Analyst
#B 441 G
G-5 # B668V
Cal. Date Due → 05-1400

REMARKS: All readings < 2 times BKG
Sample ID # 990903603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATON / Dwt Est / 100163

Reviewed by: R Zemberg

Date: 9/3/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 03	Time: 1230	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: GRID 100 North

MAP KEY: ○ ~~= SMEAR / LARGE AREA WIPE LOCATION~~ ~~□ = AIR SAMPLE LOCATION~~

○ = 1 minute counts at sample location

SKETCH: Confirmation Survey

↑ N

Bkgd. 17k

% over 16-29k

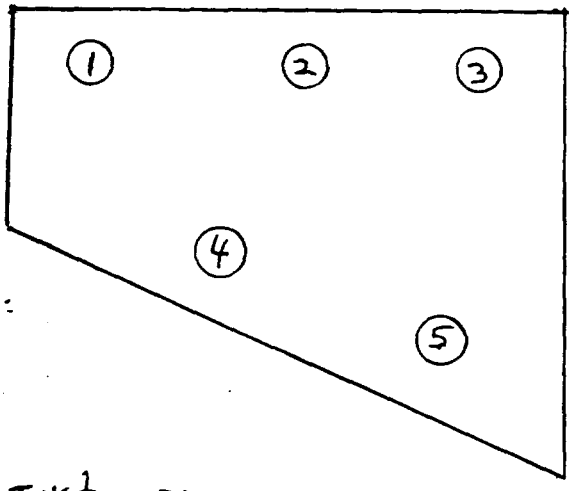
#1 19,451

#2 19,991

#3 17,301

#4 25,620

#5 18,038



Inst. Bicron Analyst
*B441G
G-S *B668V
cal. Date Due → 051400

REMARKS: All readings < 2 times BKG
Sample ID # 990903602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATONI / 100163

Reviewed by: R Zumberge Date: 9/3/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 03	Time: 1345	Page 1 of —
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

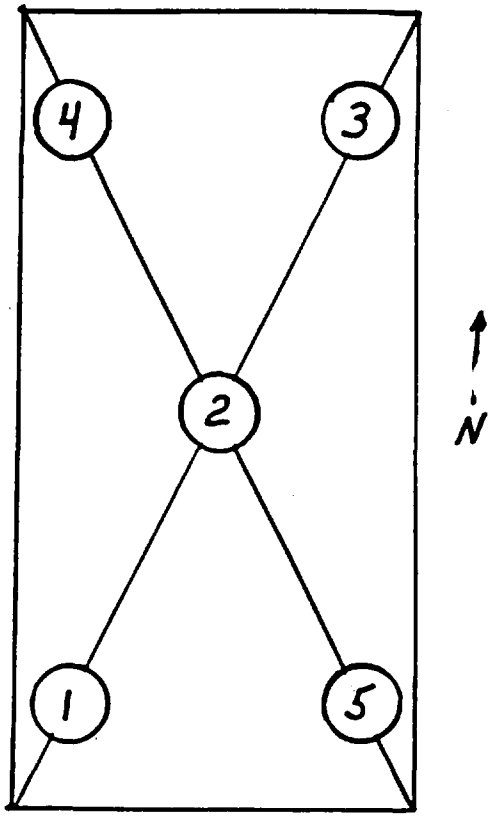
LOCATION: Grid 33 East Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	26,927 cpm
walkover	22-35,000* cpm
# 1	23092 cpm
# 2	23044 cpm
# 3	22,207 cpm
# 4	22,509 cpm
# 5	18,736 cpm



REMARKS: * 35,000 cpm at ground and 3' above ground along N and W walls of excavation. (0→4) and (4→3)
Sample ID# 990903604
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Wheeler

Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 03	Time: 1500	Page 1 of ___
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

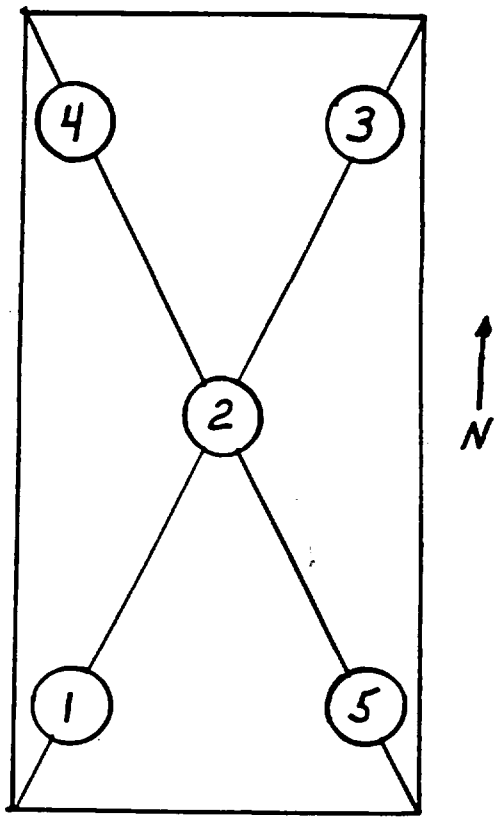
LOCATION: Grid 18 West Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5/14/00

SKETCH:

Bkgd	17,521 cpm
walkover	15-20,000 cpm
# 1	16,193 cpm
# 2	16,369 cpm
# 3	16,715 cpm
# 4	17,865 cpm
# 5	15,961 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990903605

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Ilzenberg Date: 9/7/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

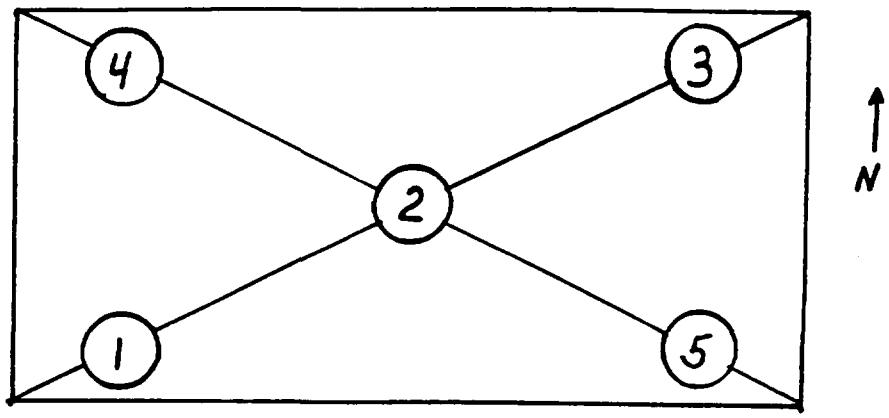
SITE: MILLENIUM	DATE: Yr 99 Mo 08 Dy 03	Time: 1540	Page 1 of —
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 17 Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5/14/00

SKETCH:



BKgd 14,571 cpm
walkover 12-18,000 cpm
#1 17,728 cpm
#2 15,805 cpm
#3 15,860 cpm
#4 15,501 cpm
#5 12,245 cpm

REMARKS: All readings < 2 times BKg
Sample ID # 990903606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Unterberg Date: 9/7/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 9/7/99 – 9/11/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	Survey Date	Scan Survey Result (Fidler)[1]	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
22 West	9/7/99	<2 X Bkg	2.4	
31 West	9/7/99	<2 X Bkg	2.3	
33 West	9/8/99	<2 X Bkg	2.1	
57 East	9/8/99	<2 X Bkg	3.7	
57 West	9/8/99	<2 X Bkg	2.1	
51 West	9/8/99	<2 X Bkg	2.4	
19	9/8/99	<2 X Bkg	2.2	
20 West	9/8/99	<2 X Bkg	2.5	
20 East	9/8/99	<2 X Bkg	2.5	
46 West	9/9/99	<2 X Bkg	2.3	
21 East	9/9/99	<2 X Bkg	1.8	
21 West	9/9/99	<2 X Bkg	2.3	
32 East	9/10/99	<2 X Bkg	2.6	
47 East	9/11/99	<2 X Bkg	2.7	
Stock Pile Area	9/11/99	<2 X Bkg	NA	Area between points (N-256.6, E-1066.3) & (N-201.6, E-1069.4) and the excavation zone boundary for Grids 19 & 20.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

Area Contamination

Elevated readings (i.e., > 2 times background measured with a Fidler) were detected North of Grid 57 in the region between the MRP demarcated excavation area and the Fields Brook Flood Plain. This area will be remediated at a future time.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 07	Time: 1410	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

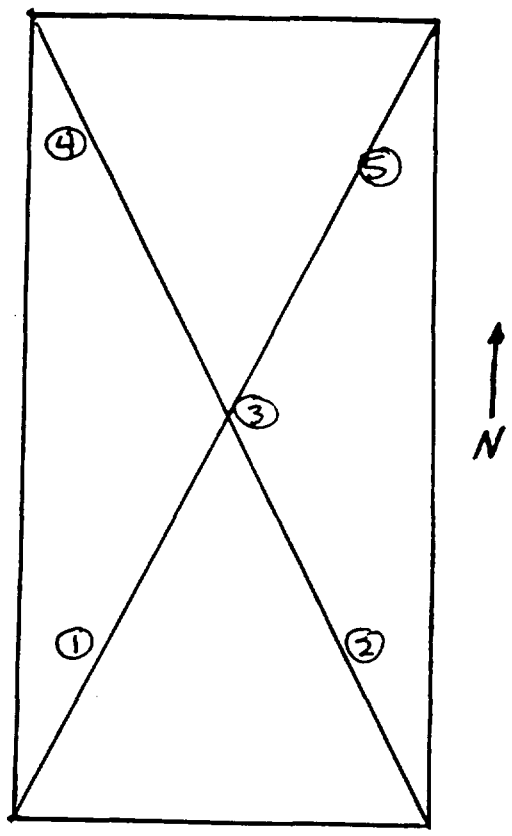
LOCATION: GRID 22 WEST Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	20034 cpm
walkover	18K TO 22K cpm
# 1	17326 cpm
# 2	17223 cpm
# 3	17969 cpm
# 4	20316 cpm
# 5	18656 cpm



REMARKS: < 2 TIMES BKGD. (all readings)
Sample ID # 990907601

JRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J Lewis /

Reviewed by: R Lomenberger Date: 9/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 07	Time: 1530	Page 1 of
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	
LOCATION: GRID 31 WEST	Confirmation Survey		

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd 22752 cpm

walkover 20K TO 25K cpm

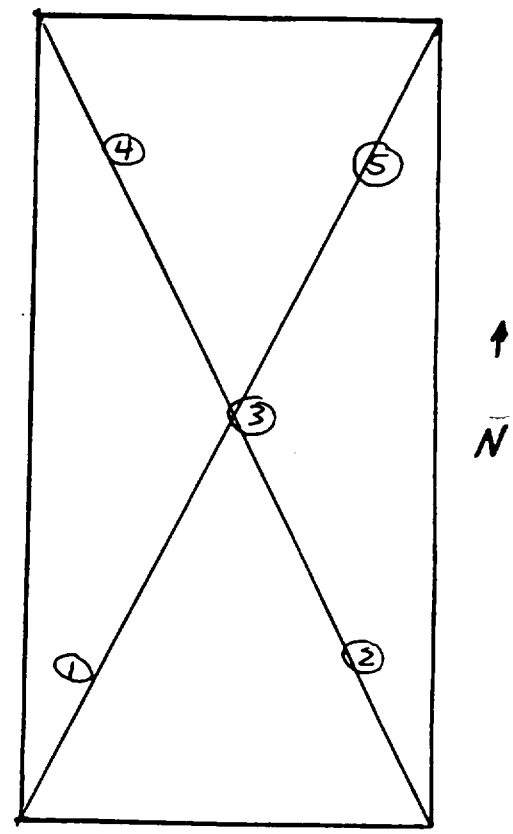
1 18512 cpm

2 16417 cpm

3 19419 cpm

4 23650 cpm

5 18127 cpm



REMARKS: < 2 TIMES BKGD. (all readings)

Sample ID # 990907602 990907603 (DUP)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: S.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 0815	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

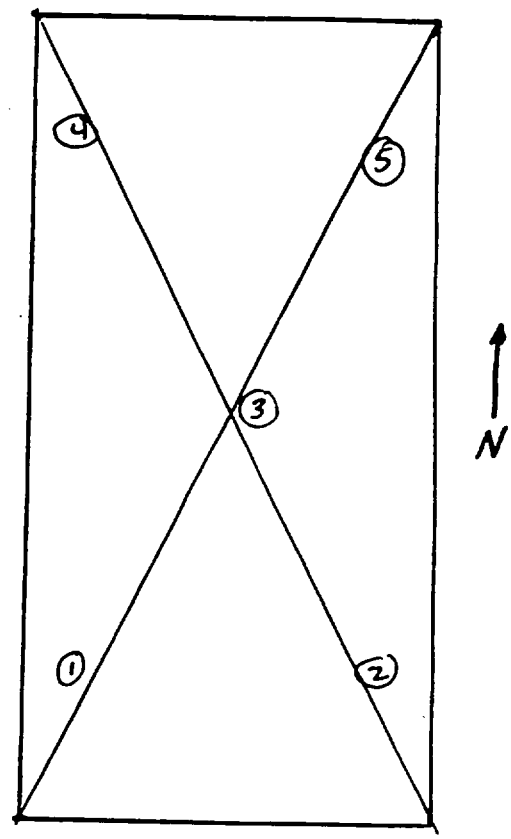
LOCATION: GRID 33 WEST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	20544	cpm
walkover	18 K TO 22K	cpm
# 1	17076	cpm
# 2	16860	cpm
# 3	16690	cpm
# 4	18634	cpm
# 5	16987	cpm



REMARKS: All readings < 2 times Bkg
Sample ID 990408601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: [signature] Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1010	Page ___ of ___
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

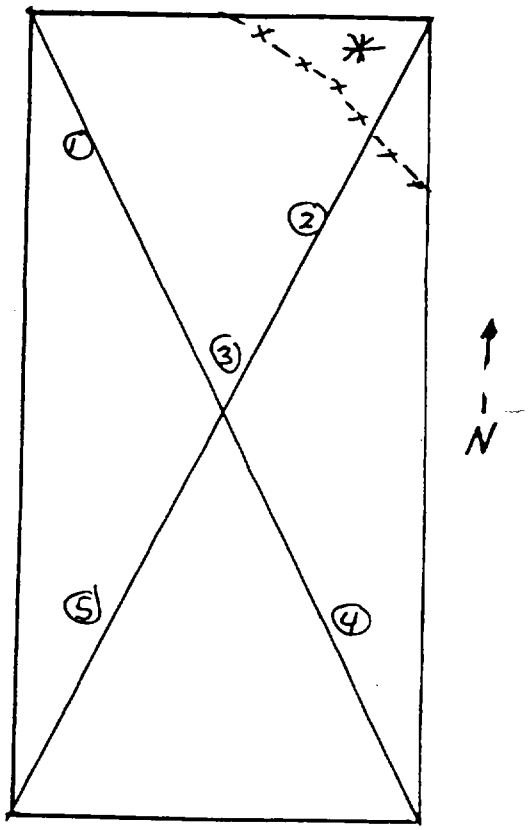
LOCATION: GRID 57 EAST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	18068	cpm
walkover	18K TO 22K	cpm
# 1	16426	cpm
# 2	15292	cpm
# 3	19053	cpm
# 4	17526	cpm
# 5	17963	cpm



REMARKS: * AREA TO BE REMOVED @ LATER DATE 40K TO 50K
All readings in area released are < 2 times Bkg
Sample ID # 990908602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J Lewis /

Reviewed by: R Jewenheyer Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1035	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

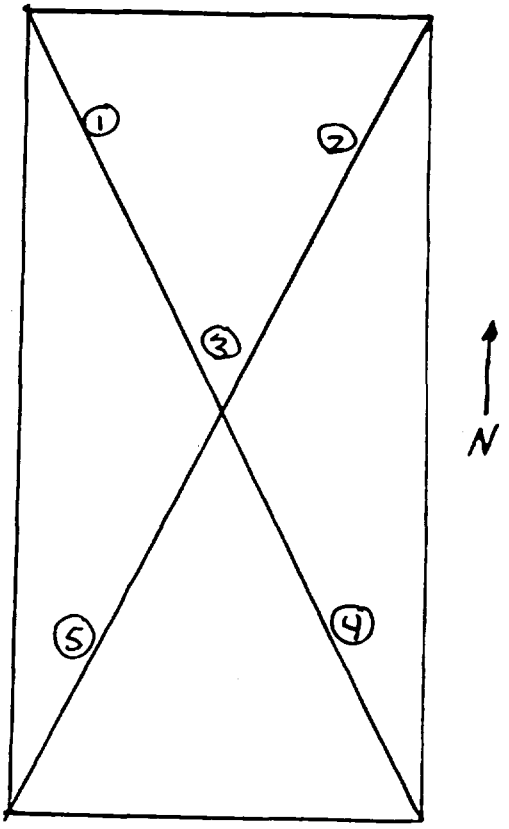
LOCATION: GRID 57 WEST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	17196	cpm
walkover	15K TO 20K	cpm
# 1	14928	cpm
# 2	16203	cpm
# 3	14495	cpm
# 4	14861	cpm
# 5	18489	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990908603

JRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: L Jenenberg Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1110	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

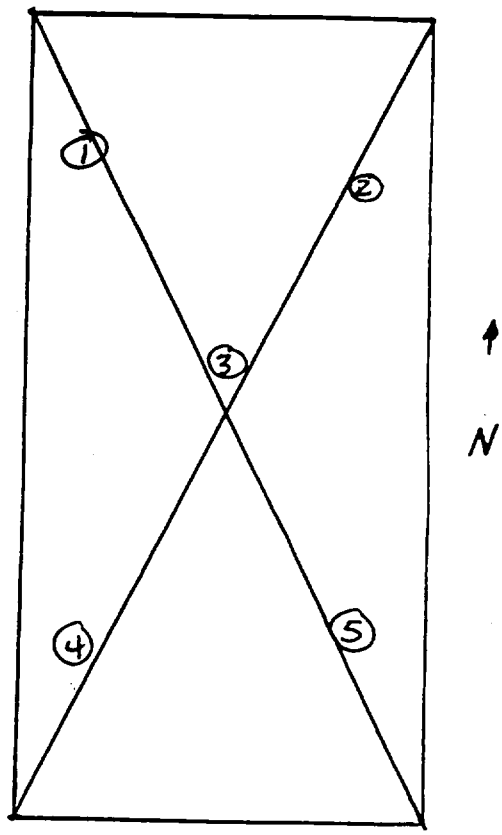
LOCATION: GRID 51 WEST Confirmation Survey

Bicron analyst #B441G
" G-5 #B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	18247 cpm
walkover	15K TO 18K cpm
# 1	16995 cpm
# 2	17364 cpm
# 3	16223 cpm
# 4	14278 cpm
# 5	14896 cpm



REMARKS: All reading < 2 times Bkg
Sample ID # 990908604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J. Lewis /

Reviewed by: K Jenenberg Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

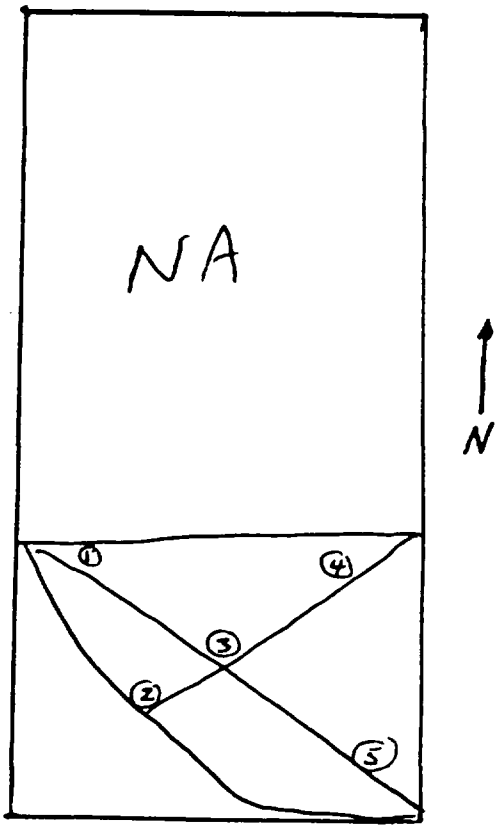
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1145	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 19 Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M
Cal. Due 5-14-00

SKETCH:

Bkgd	14958	cpm
walkover	15K TO 20K	cpm
# 1	15097	cpm
# 2	12972	cpm
# 3	15617	cpm
4	15848	cpm
# 5	11872	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990908605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis

Reviewed by: R Leuenberger Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1710	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

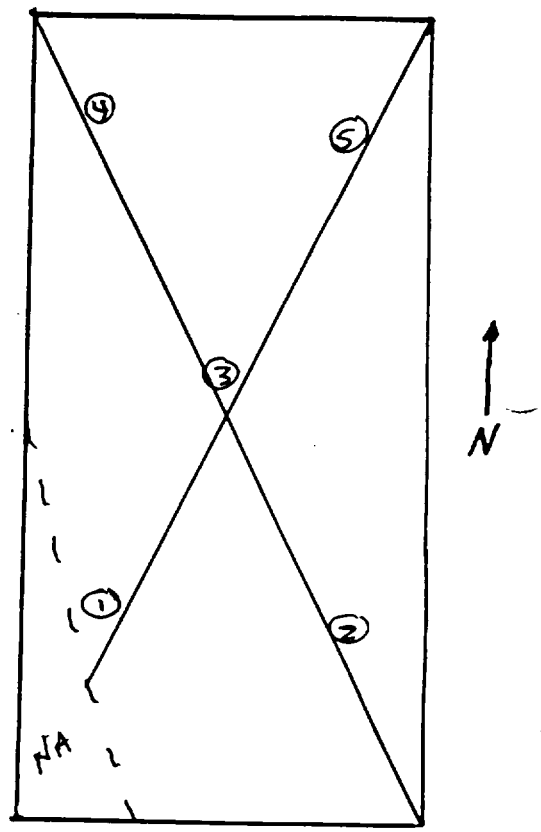
LOCATION: GRID 20 WEST Confirmation Survey

Bicron analyst #A228Z
" G-5 #B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	17008	cpm
walkover	16K TO 20K	cpm
# 1	15663	cpm
# 2	15881	cpm
# 3	15848	cpm
# 4	16158	cpm
# 5	17177	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990908606

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J Jh /

Reviewed by: R Ilenenberg

Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 08	Time: 1740	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

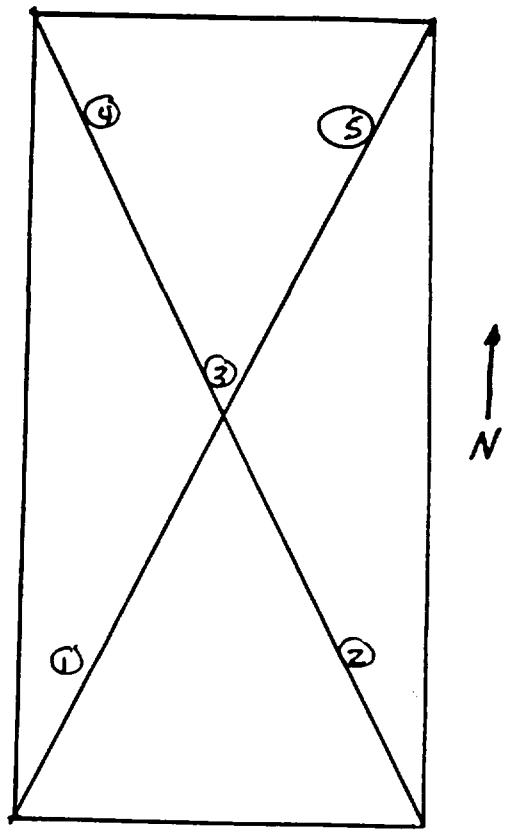
LOCATION: GRID 20 EAST Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	16533	cpm
walkover	15K TO 18K	cpm
# 1	15041	cpm
# 2	14736	cpm
# 3	15626	cpm
4	15801	cpm
# 5	15927	cpm



REMARKS: All readings < 2 times BKG
Sample ID # 990908607

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zemberg Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 09	Time: 1340	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

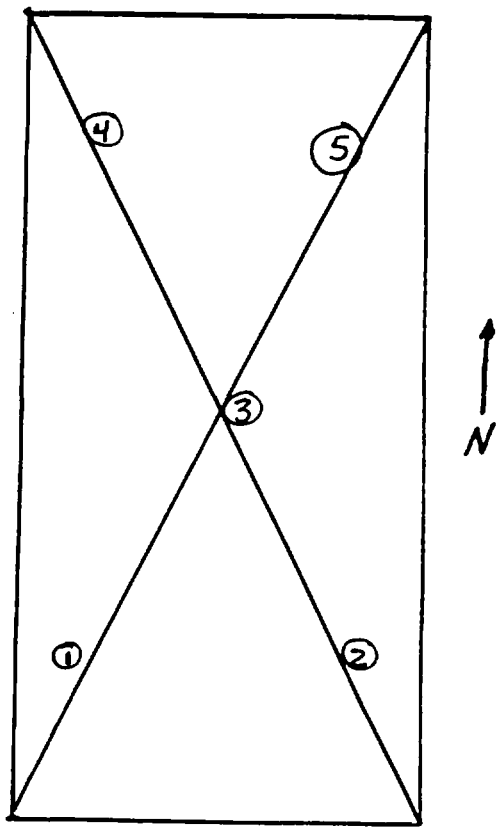
LOCATION: GRID 46 WEST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	18858	cpm
walkover	16K TO 22K	cpm
# 1	15721	cpm
# 2	14740	cpm
# 3	17449	cpm
# 4	18889	cpm
# 5	16077	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990909601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / [signature] /

Reviewed by: [signature] Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

..E: MILLENIUM	DATE: Yr 99 Mo 09 Dy 09	Time: 1420	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 21 EAST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd 15834 cpm

walkover ~~14266~~ 9-9-99 15K-18K cpm

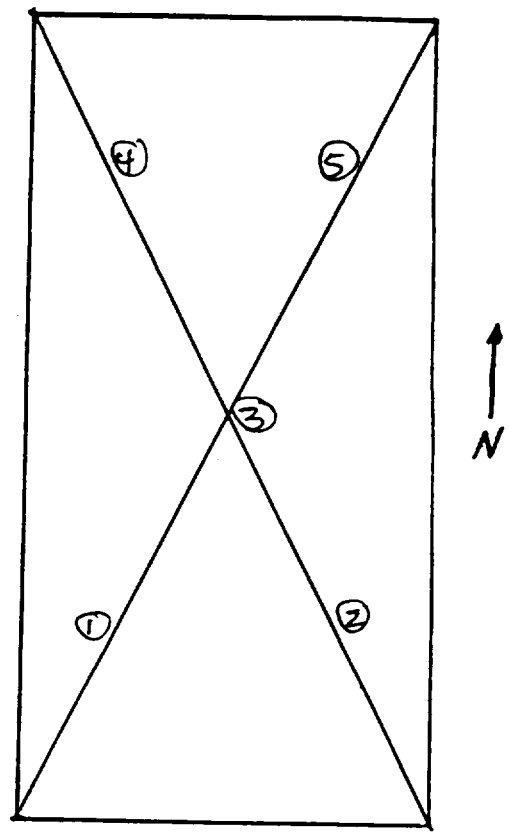
1 ~~14171~~ 9-9-99 14266 cpm

2 14171 cpm

3 13199 cpm

4 15447 cpm

5 14700 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 990909602

..EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: R Tennebeyer

Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 09	Time: 1445	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

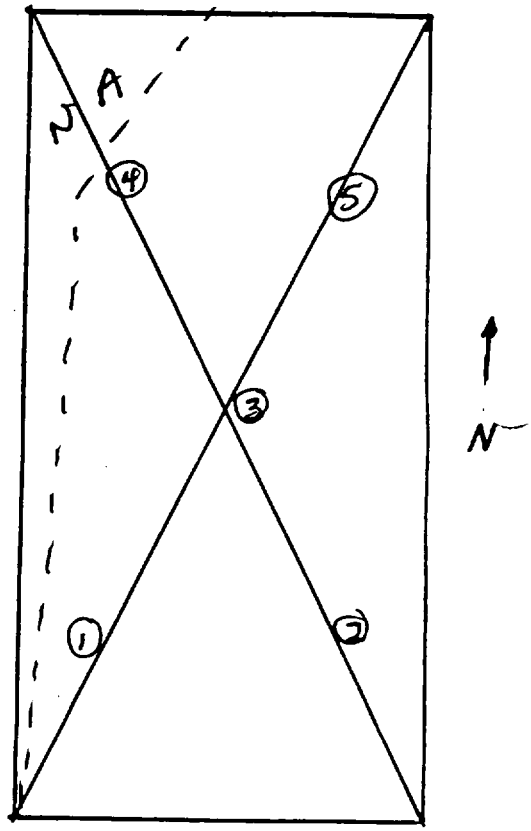
LOCATION: GRID 21 WEST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	15779	cpm
walkover	15K TO 19K	cpm
# 1	15616	cpm
# 2	14577	cpm
# 3	12543	cpm
# 4	15882	cpm
# 5	14456	cpm



REMARKS: All readings < 2 times BKG
Sample ID # 990909603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: K Jenenhezer Date: 9/9/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

.E: MILLENIUM	DATE: Yr 99 Mo 09 Dy 10	Time: 0800	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

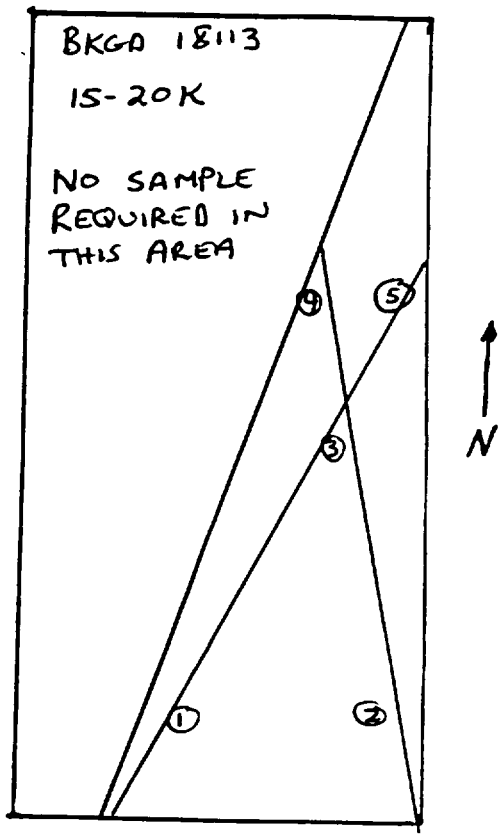
LOCATION: GRID 32 EAST Confirmation Survey

Bicron analyst #A228Z
" G-5 #B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	16839	cpm
walkover	15K TO 20K	cpm
# 1	14462	cpm
# 2	16116	cpm
# 3	14930	cpm
4	14703	cpm
# 5	15998	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990910601

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zeuenberger Date: 9/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 10	Time: 0810	Page 1 of
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

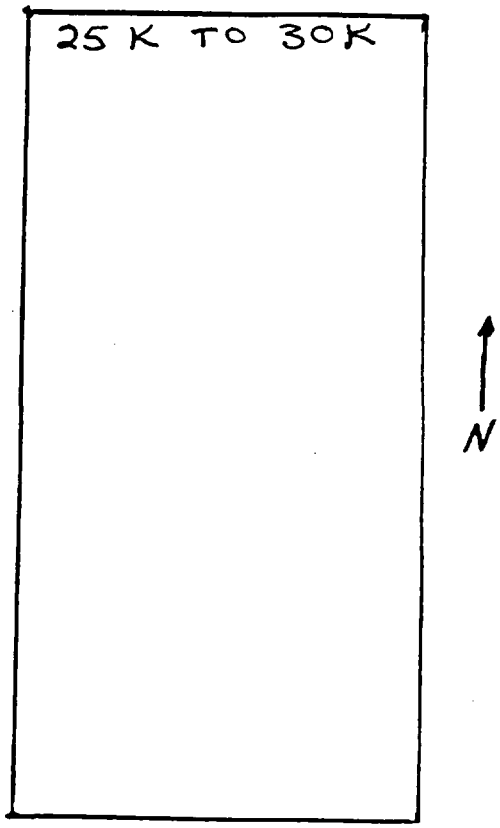
LOCATION: NORTHERN EDGE ON GRID 32 ~~WEST~~ EAST. CONCRETE PAD EDGE

Bicron analyst #A2287
" G-5 #B588M
Cal. Due 5-14-00

Confirmation Survey

SKETCH:

Bkgd 21078 cpm
walkover 25K TO 30K cpm
1 NA cpm
2 cpm
3 cpm
4 cpm
5 NA cpm



REMARKS: FIDDLER WALKOVER OF SOIL AND FILL MATERIAL UNDER CONCRETE.
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/11/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

...E: MILLENIUM	DATE: Yr 99 Mo 09 Dy 11	Time: 0830	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

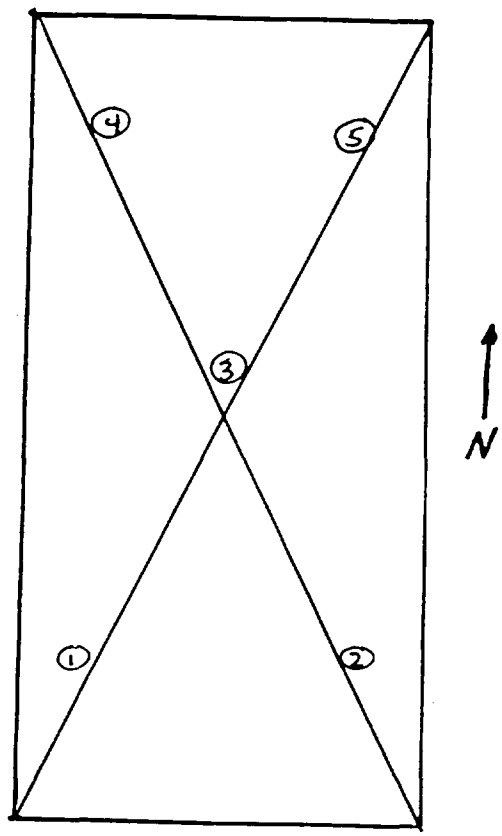
LOCATION: GRID 47 EAST Confirmation Survey

Bicron analyst #A228Z
" G-5 # B558M

Cal. Due 5-14-00

SKETCH:

Bkgd	20224	cpm
walkover	20K TO 30K	cpm
# 1	15979	cpm
# 2	16211	cpm
# 3	22886	cpm
4	19046	cpm
# 5	21222	cpm



REMARKS: WESTERN GRID MARKS OFF-SET ~~TWO FEET~~ JFL 9-11-99 2 FEET. THIS IS WERE EXCLUSION FENCE TO BE SET, PER JEFF KYSER.
Sample ID # 990911601
All readings < 2 times Bkg

...EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Lenenberger Date: 9/14/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 11	Time: 1500	Page ___ of
RWP No.	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: See Map below Confirmation Survey

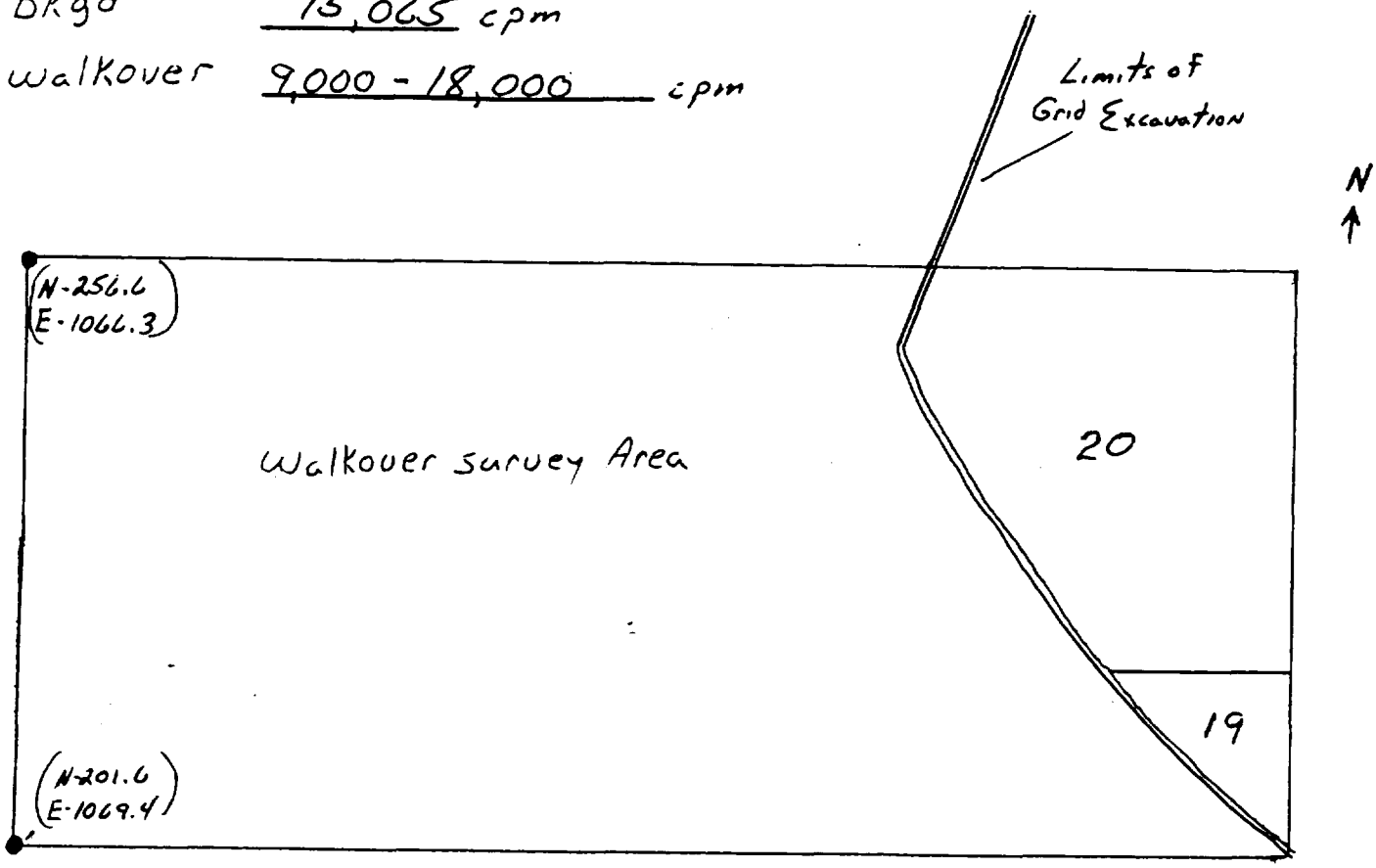
Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 15,065 cpm

walkover 9,000 - 18,000 cpm



REMARKS: All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100...

Reviewed by: R Kneuberger Date: 9/14/99

Millennium MRP Remediation Project
Confirmation Grid Survey Summary Report
for
Work Week of 9/13/99 – 9/18/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
58 North	9/13/99	<2 X Bkg	2.0	
58 South	9/14/99	<2 X Bkg	2.2	
50 East	9/15/99	<2 X Bkg	2.9	
47 West	9/15/99	<2 X Bkg	2.5	
48 West	9/16/99	<2 X Bkg	2.3	
50 West	9/18/99	<2 X Bkg	2.1	
60 East	9/18/99	<2 X Bkg	2.0	
Stock Pile Area	9/14 – 9/18 /99	<2 X Bkg	NA	Lay-down area East of 900 East.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

Area Contamination

Elevated readings (i.e., > 2 times background measured with a Fidler) were detected on dirt at the base of 2 telephone poles at the South ridge of the Stock Pile Cement Pad. These poles will be removed and the area will be remediated at a future time.

Elevated readings (i.e., > 2 times background measured with a Fidler) were detected at one location on the South Half of the Stock Pile Cement Pad. The area with the elevated readings was marked and will be remediated at a future time.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

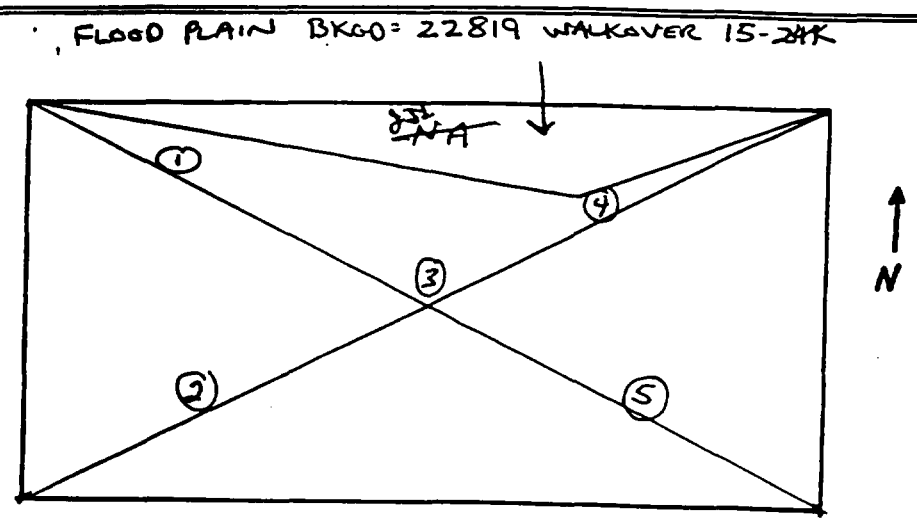
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 13	Time: 0915	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 58 ~~[illegible]~~ 9-13-99 NORTH Confirmation

Bicron analyst # B441G
" G-5 #

Cal Due 5-14-00

SKETCH:



Bkgd	20283	cpm
walkover	15K TO 24K	cpm
#1	19545	cpm
#2	19084	cpm
#3	17120	cpm
#4	16246	cpm
#5	15985	cpm

REMARKS: WALKOVER OF 59 FLOOD PLAIN AREA 15-25K WITH FIDDLER WALKOVER.
Sample ID # 990913601
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/14/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

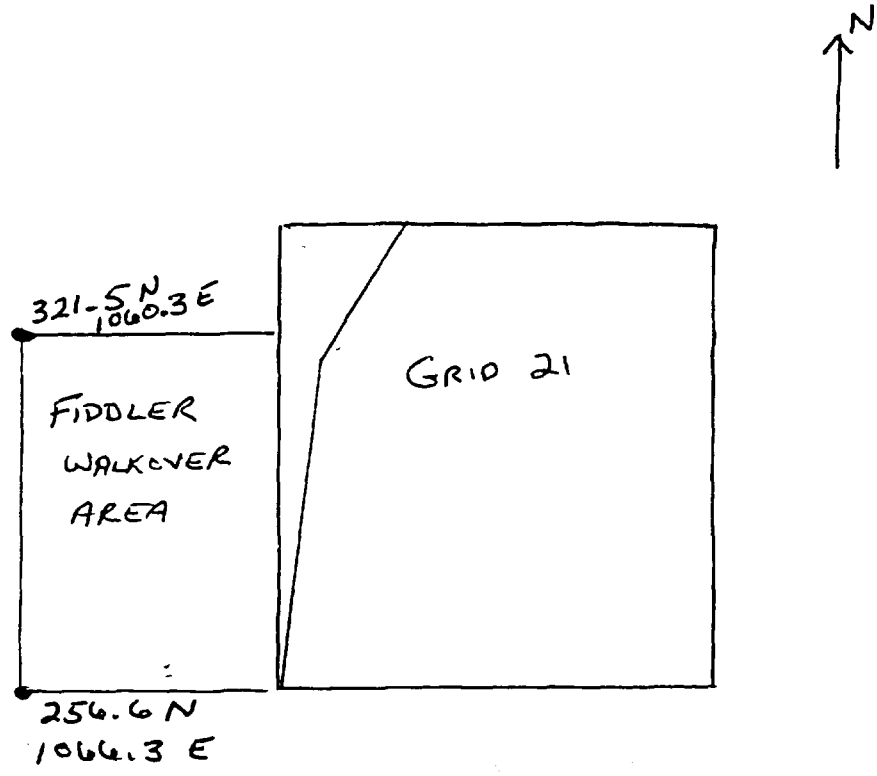
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 14	Time: 1030	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: AREA WEST OF GRID 21 Confirmation Survey

MAP KEY: N/A = SMEAR / LARGE AREA WIPE LOCATION N/A = AIR SAMPLE LOCATION

SKETCH:



FIDDLER
A2282
B588M
5-14-00

REMARKS: FIDDLER WALKOVER OF AREA WEST OF GRID 21.
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

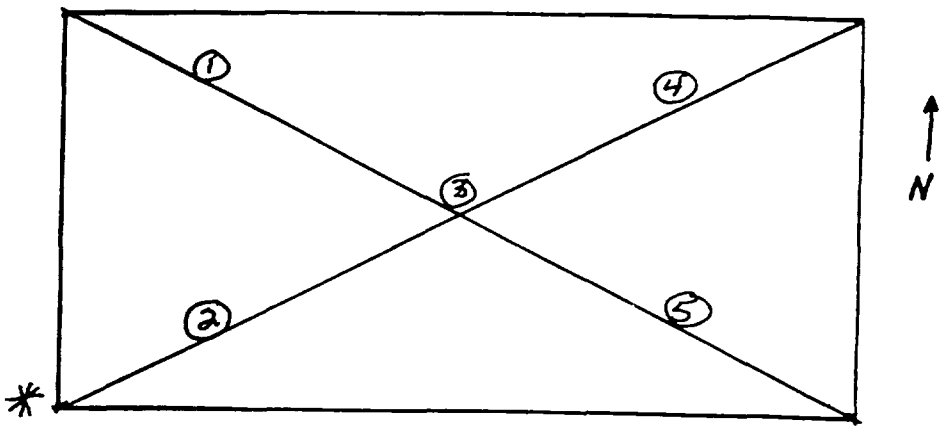
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 14	Time: 1500	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 58 SOUTH Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd	17888	cpm
walkover	15K TO 20K	cpm
#1	16990	cpm
#2	20372	cpm
#3	14046	cpm
#4	14113	cpm
#5	16401	cpm

Sample ID # 990914601

REMARKS: * BUTTED-UP TO AREA THAT STILL NEEDS TO BE EXCAVATED.
15 TO 20 FOOT WALL AT THIS POINT

All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis / —

Reviewed by: R Tenenbaum Date: 9/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 15	Time: 0920	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 50 EAST Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588 M

Cal. Due 5-14-00

SKETCH:

Bkgd 17647 cpm

walkover 15K TO 20K cpm

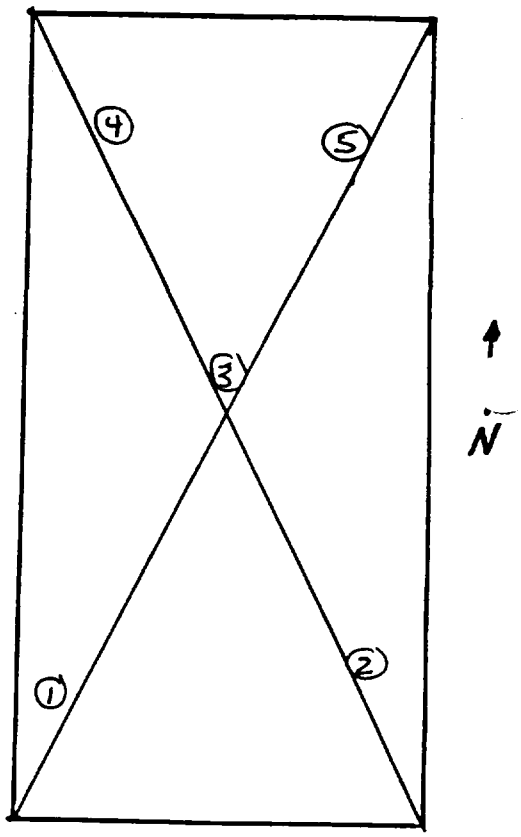
1 15342 cpm

2 15149 cpm

3 18025 cpm

4 16703 cpm

5 17316 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 99091560 1

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

/ / / /

Reviewed by: [signature] Date: 9/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

C: MILLENIUM	DATE: Yr 99 Mo 09 Dy 15	Time: 1345	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

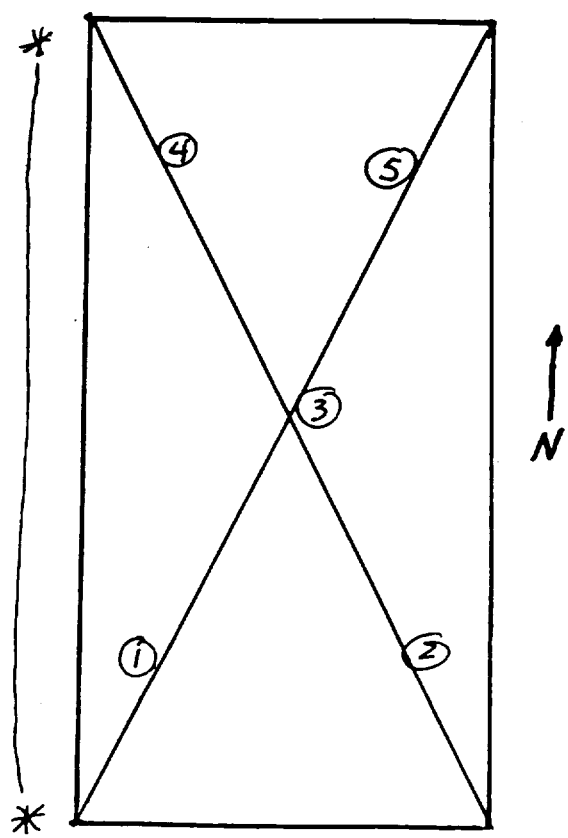
LOCATION: GRID 47 WEST Confirmation Survey

Bicron analyst #A2282
" G-5 #B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	16860	cpm
walkover	15K TO 20K	cpm
# 1	15115	cpm
# 2	13089	cpm
# 3	16429	cpm
4	16548	cpm
# 5	16825	cpm



REMARKS: * FIDDLER SCAN OF GRAVEL UNDER CONCRETE PAD 15K TO 25K.
Sample ID # 990915002
All readings < 2 times BKg

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Turnley Date: 9/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

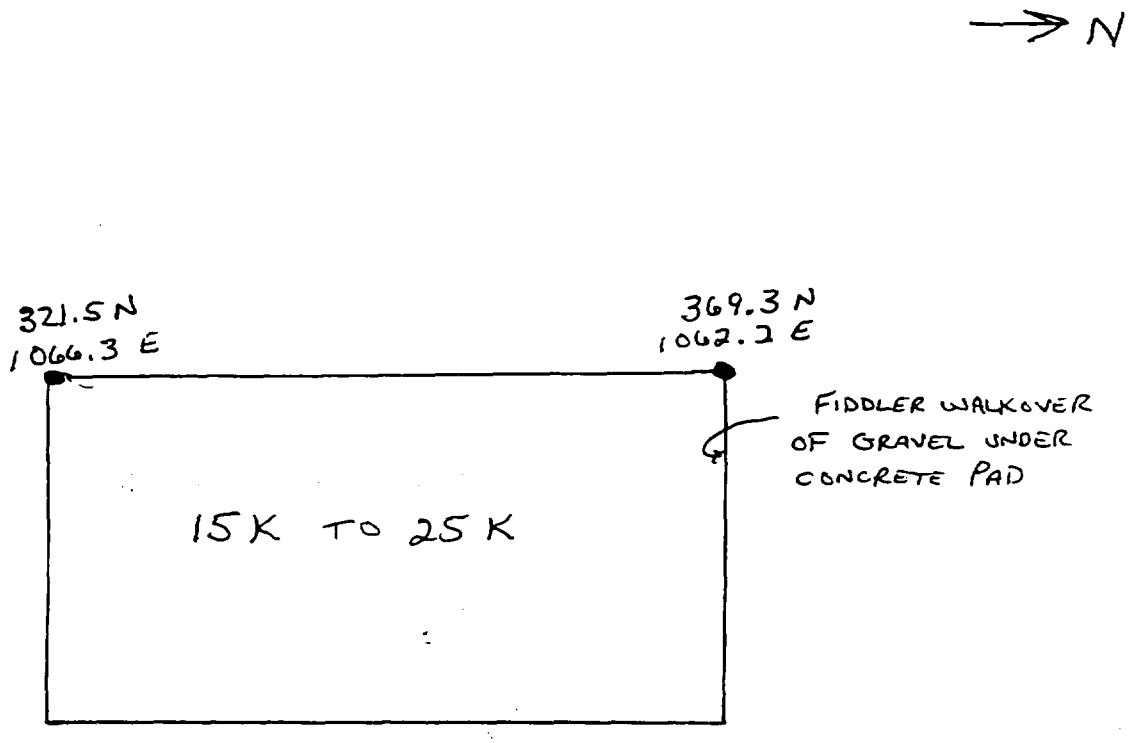
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Y 99 Mo 09 Dy 15	Time: 1400	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: AREA WEST OF GRIDS 21 + 32 Confirmation Survey

MAP KEY: ○ = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



FIDOLER
BICRON ANALYST = A228Z
PROBE = B588M
CAL. DUE = 5-14-00

REMARKS: FIDDLER WALKOVER OF EXCAVATED AREA.
BKGD 16596
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/16/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

..TE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 16	Time: 1112	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

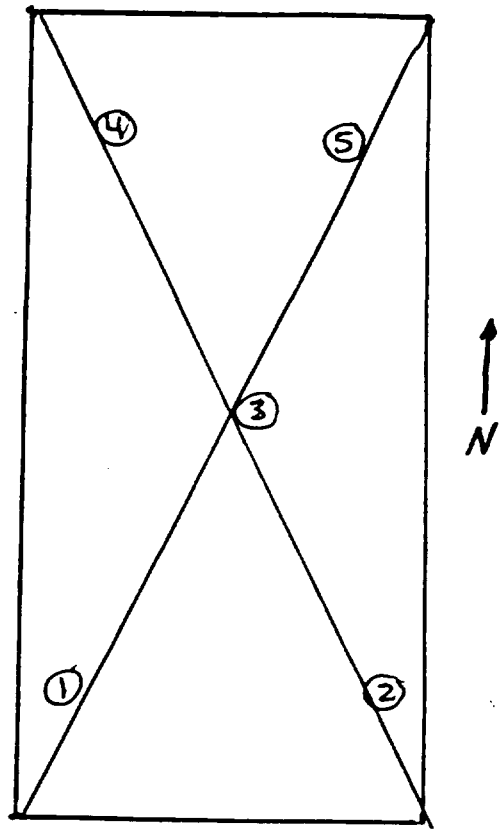
LOCATION: GRID 48 WEST Confirmation Survey

Bicron analyst #A228Z
" G-5 #B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	19025	cpm
walkover	15K TO 25K	cpm
# 1	17034	cpm
# 2	15828	cpm
# 3	16899	cpm
# 4	15242	cpm
# 5	19293	cpm



REMARKS: All readings L 2 times Bkg
Sample ID # 990916601

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: Date:

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 16	Time: 1430	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: See Map Confirmation Survey

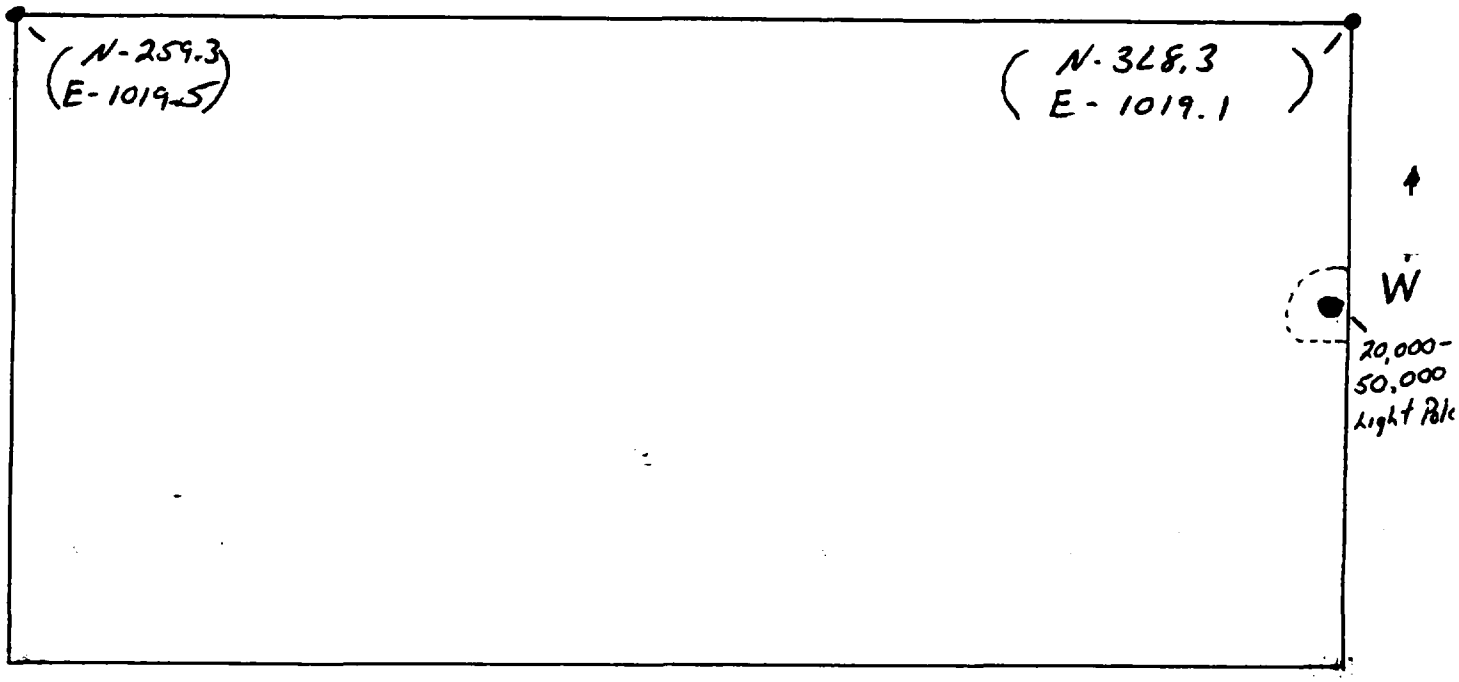
Bicron analyst # B441G
" G-5 # 8668V

Cal. Due 5-14-00

SKETCH:

Bkgd 14 782 cpm

walkover 13,000 – 22,000 cpm



REMARKS: Walkover survey of Excavated area

All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: Tim Blakeslee / Blakeslee / 100141

Reviewed by: R Ehrenberg Date: 9/17/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 16	Time: 1710	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: See Map Confirmation Survey

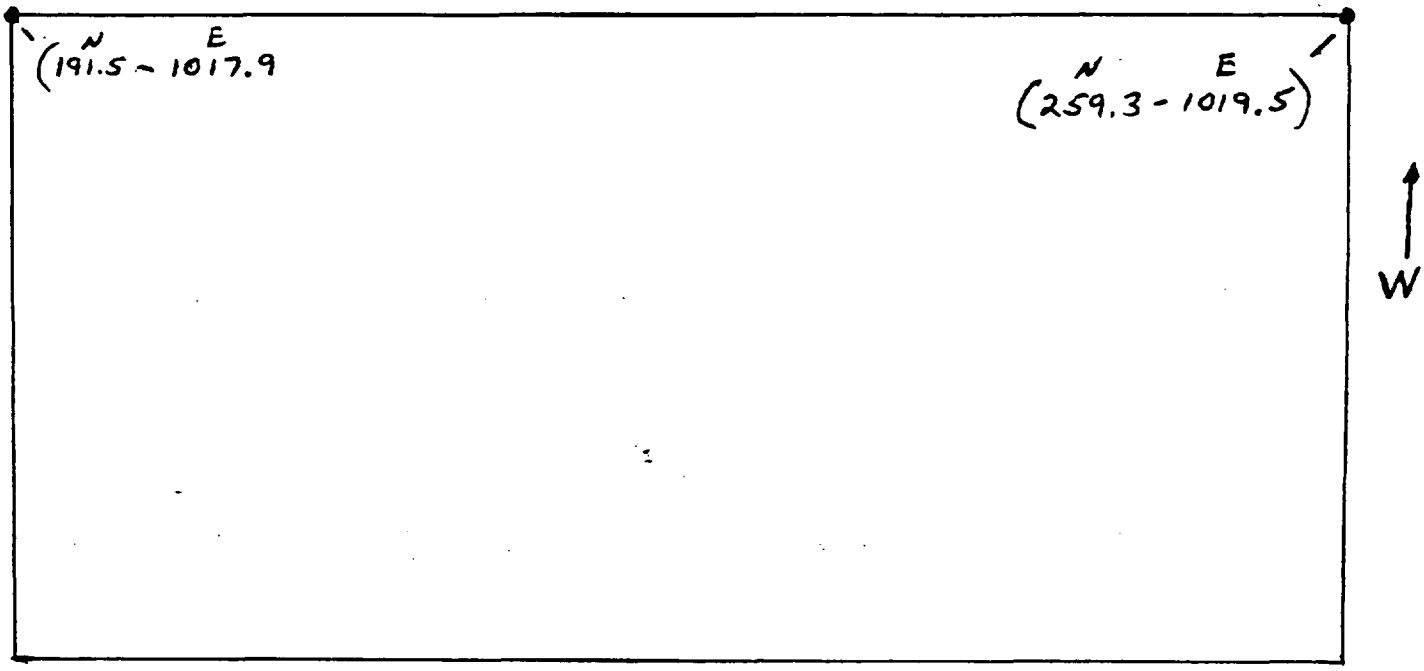
Bicron analyst # B441G
" G-5 # 8268V

Cal. Due 5-14-00

SKETCH:

Bkgd 15054 cpm

walkover 13,000 - 17,000 cpm



REMARKS: Walk over area survey of Excavations
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: [signature] Date: 9/17/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

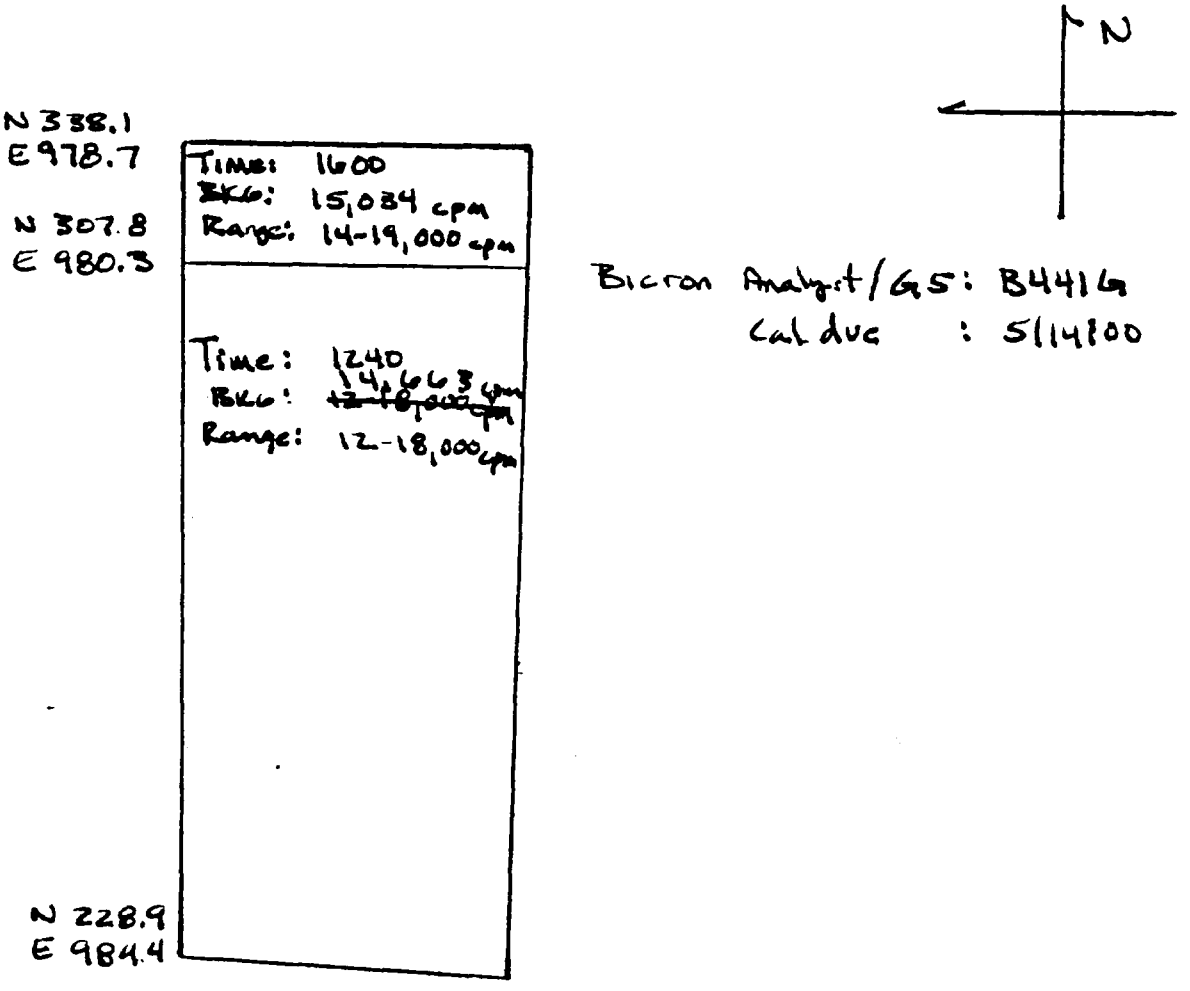
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 9 Dy 17	Time: see below	Page 1 of 1
RWP No. 99003	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Confirmatory walkover survey of stockpiled area

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



Bicron Analyst/GS: B4416
Cal due : 5/14/00

REMARKS: All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeuenberger Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

ITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 18	Time: 0935	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

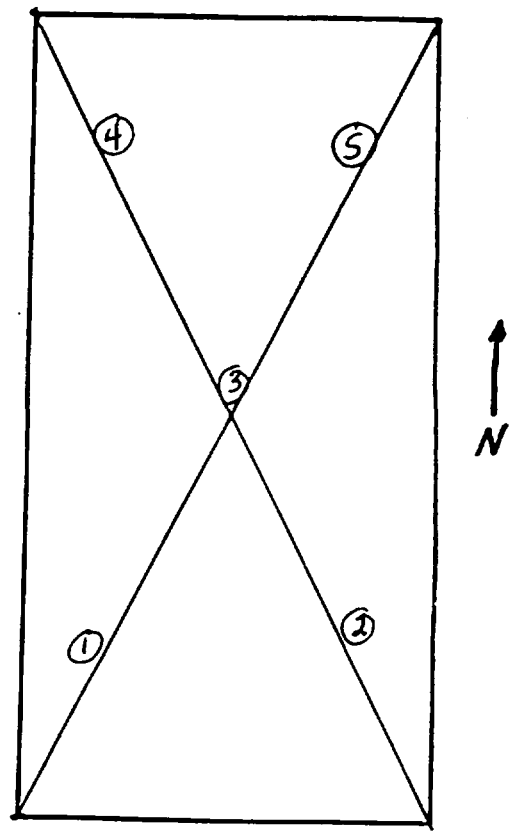
LOCATION: GRID 50 WEST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	18816 cpm
walkover	15K TO 22K cpm
# 1	15292 cpm
# 2	16854 cpm
# 3	15577 cpm
# 4	16374 cpm
# 5	13687 cpm



REMARKS: All readings < 2 times BKG

Sample ID # 990918601

.VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / [signature] /

Reviewed by: [signature] Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 18	Time: 1045	Page 1
RWP No.	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: See map Confirmation Survey

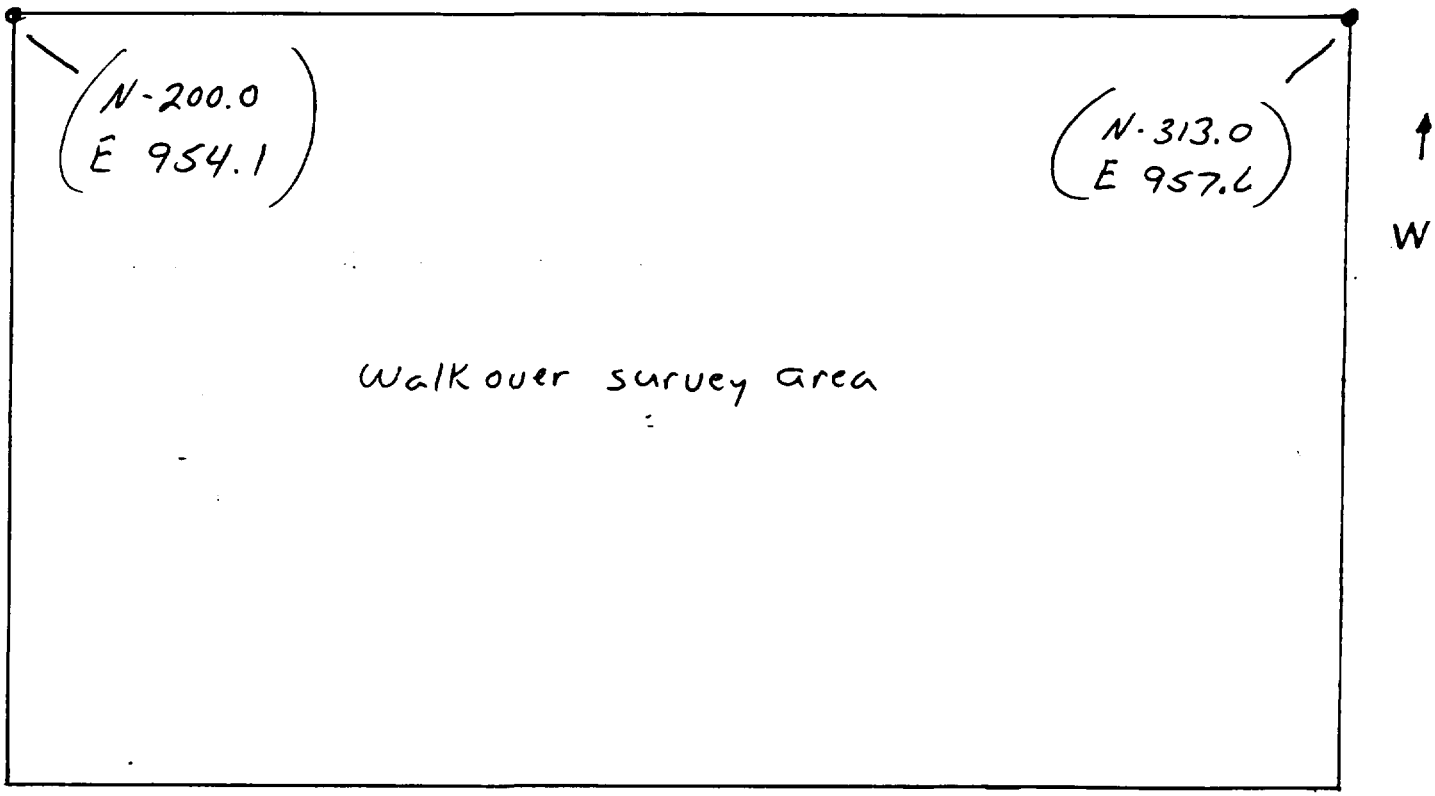
Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 15 423 cpm

walkover 12,000 - 18,000 cpm



REMARKS: All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: L Heuenberger

Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

.TE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 18	Time: 1315	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

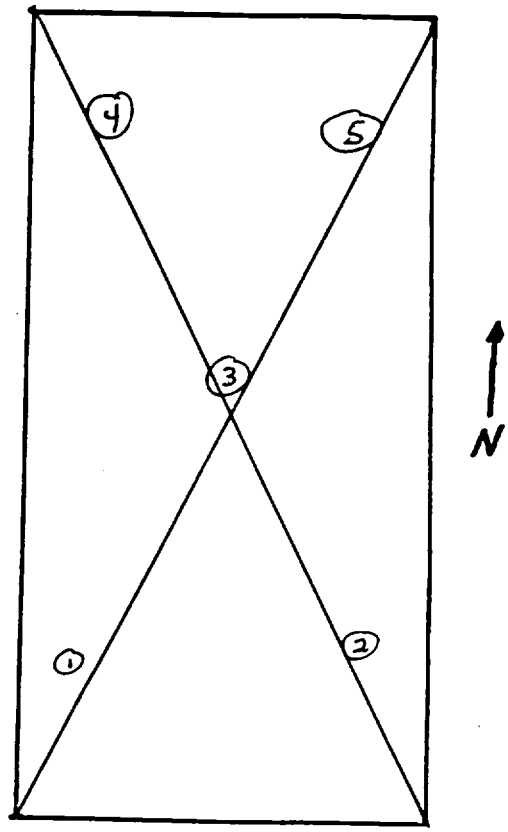
LOCATION: GRID 60 EAST Confirmation Survey

Bicron analyst # B441G
" G-5 # B668V

Cal. Due 5-14-00

SKETCH:

Bkgd	~~18816~~ 16699 9-18-99 cpm
walkover	15K TO 20K cpm
# 1	13871 cpm
# 2	13916 cpm
# 3	14334 cpm
# 4	16677 cpm
# 5	13083 cpm



REMARKS: EXCAVATED AREA NORTH OF GRID AND SOUTH OF BLUE STAKES = 18678 BKG, 15K TO 20K WALKOVER

Sample ID # 990918602

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: K Zenenberger Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 18	Time: 1400	Page 1 of 2
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	
LOCATION: CONCRETE PAD			

MAP KEY: X = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:

DIRECT FRISK OF CONCRETE PAD
10K TO 20K

SMALL AREAS OF FIXED CONTAMINATION
IDENTIFIED WITH ORANGE PAINT.
AREAS UP TO 159,000 CPM. SEE PAGE 2

WIPE SURVEY OF CONTAMINATED AREA
< 200 DPM PER PROBE AREA.

CONCENTRATED ON ALL CRACKS AND EXPANSION JOINTS.

FIDDLER
A2282
B558M
5-14-00

~~FIDDLER~~ JJ 9-18-99
2401-P
INST. 155307
CAL DUE 5-17-00

REMARKS: BKGD TAKEN ON CONCRETE PAD EAST OF AND OUT OF EXCLUSION ZONE BKGD = 11255

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9-20-99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

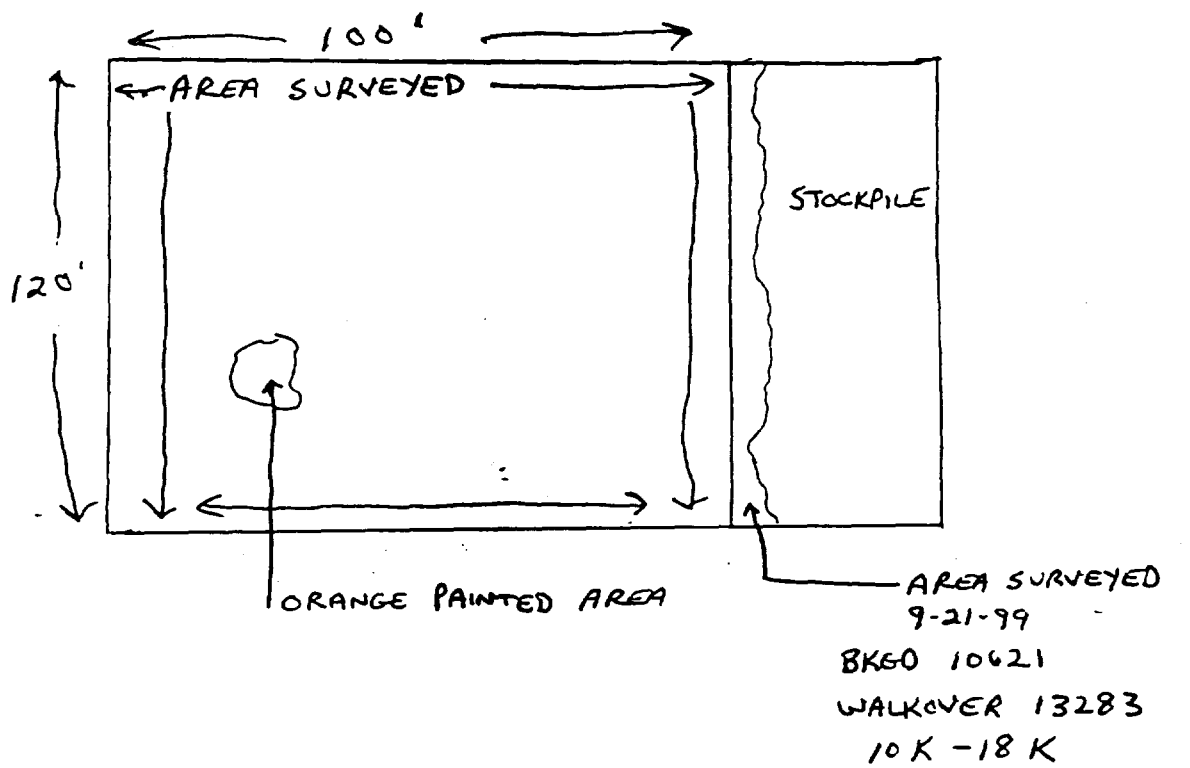
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 18	Time: 1400	Page 2 of 2
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

LOCATION: CONCRETE PAD

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION N/A AIR SAMPLE LOCATION

SKETCH: AREA DIMENSIONS



REMARKS: FIDDLER FOR 9-21-99 WALKOVER ANALYST B466J, PROBE B598C CAL. DUE 2-9-00. AREA SURVEYED ON DIRT FREE CONCRETE ONLY.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9-20-99/9-21/99

Millennium MRP Remediation
Confirmation Grid Survey Summary Report
for
Work Week of 9/20/99 – 9/25/99

Grid Surveys (21 Day Gamma Spectroscopy Results)				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
49 East	9/20/99	<2 X Bkg	2.3	
49West	9/21/99	<2 X Bkg	2.2	
48 East	9/21/99	<2 X Bkg	5.3	
60 West	9/22/99	<2 X Bkg	2.8	
Grid East of 41E	9/24/99	<2 X Bkg	NA	
South End of Cement Pad	9/21/99	<2 X Bkg	NA	Elevated readings, measured the previous work week have been remediated.
Stock Pile Area	9/14 – 9/18 /99	<2 X Bkg	NA	Lay-down area West of 900 East.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

Area Contamination

Elevated readings (i.e., > 1.5 times background measured with a Fidler) were detected on dirt at the East limit of Grid 41. A soil sample taken at the location of the elevated reading measured 23 pCi/g (clean-up goal is 12 pCi/g). The area with the elevated readings was marked (Caution tape), and the soil will be remediated and resurveyed at a future time.

Elevated readings (i.e., > 2 times background measured with a Fidler) were detected on dirt at location N269.4/E898.5. The area with the elevated readings was marked (Orange fence), and will be remediated at a future time.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

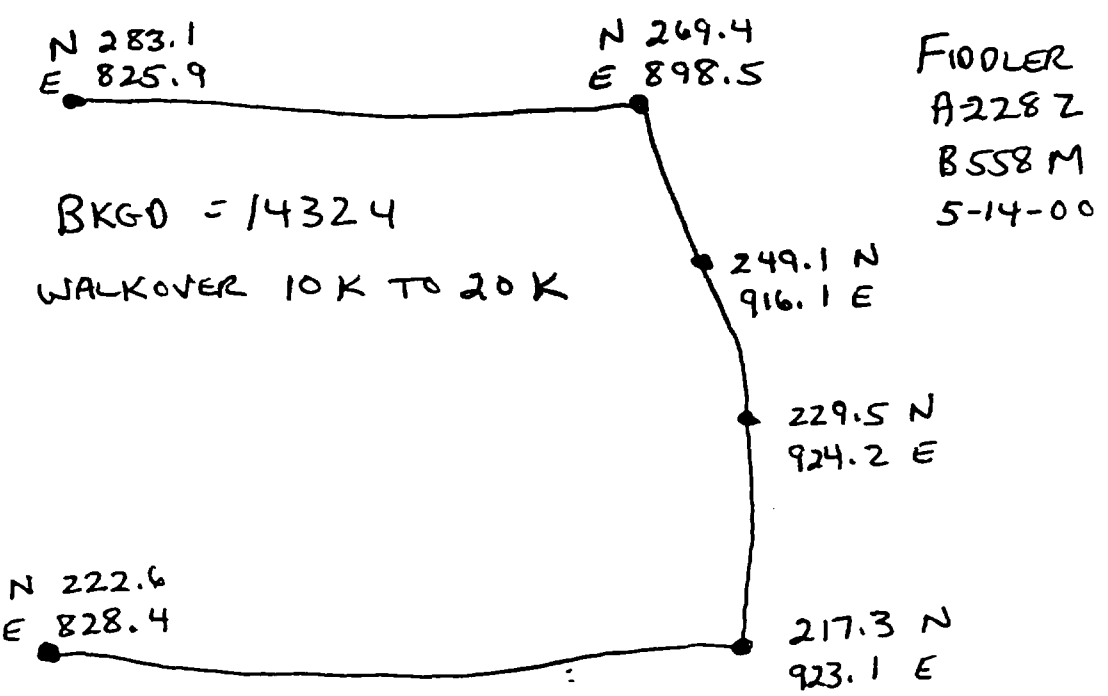
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 20	Time: 0845	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: SOUTHWEST CORNER OF EXCLUSION ZONE

MAP KEY: N/A = SMEAR / LARGE AREA WIPE LOCATION N/A = AIR SAMPLE LOCATION

SKETCH:



REMARKS: AREA POSTED OF WITH CAUTION TAPE.
SMALL AREA BY N 269.4/E 898.5 >50K CPM

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F L

Reviewed by: J Elart. Date: 9-20-99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 20	Time: 1000	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

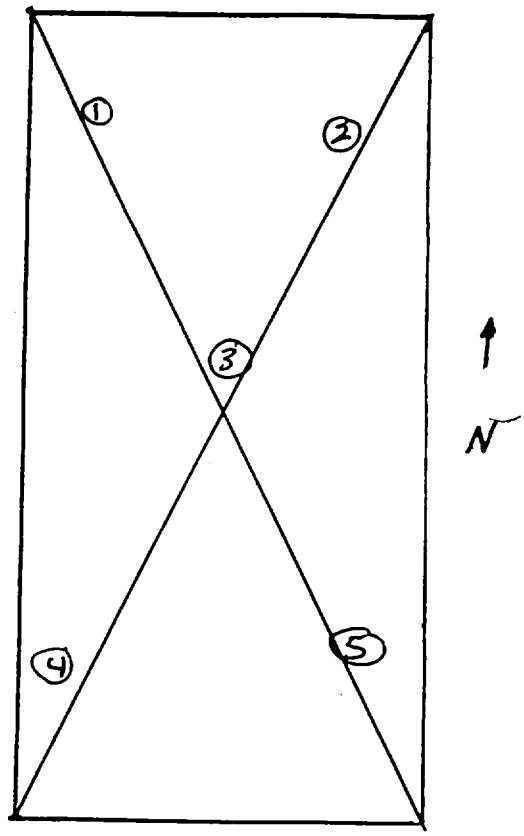
LOCATION: GRID 49 EAST + DUPLICATE SAMPLE Confirmation Survey

Bicron analyst # A2282
" G-5 # B558M

Cal. Due 5-14-00

SKETCH:

Bkgd	17410 cpm
walkover	15K TO 20K cpm
# 1	17713 cpm
# 2	16609 cpm
# 3	17662 cpm
# 4	16787 cpm
# 5	16802 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 990920601, 990920601 (Dup)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / [signature] /

Reviewed by: [signature] Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

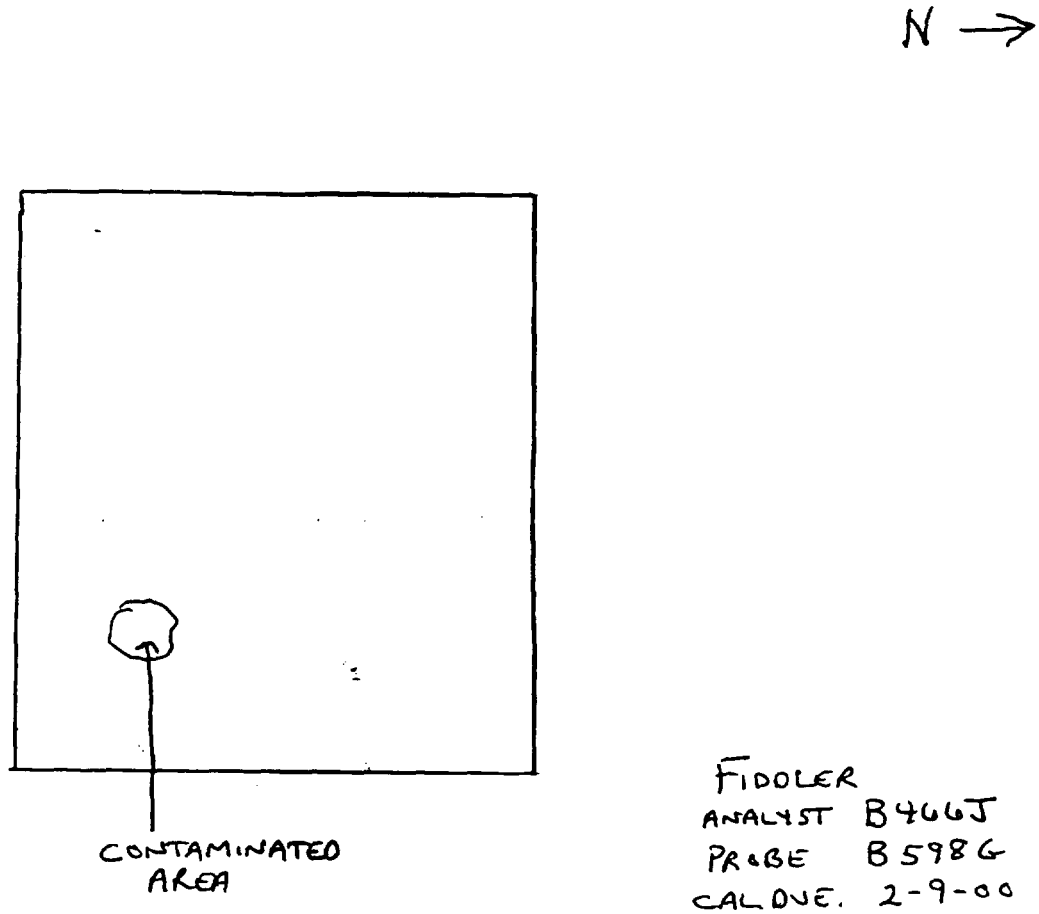
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 21	Time: 1330	Page 1 of 1
RWP No. 99-003	WORK ORDER No. —	BLDG. No. —	

LOCATION: CONCRETE SLAB

MAP KEY: N/A = SMEAR / LARGE AREA WIPE LOCATION N/A = AIR SAMPLE LOCATION

SKETCH:



FIDDLER
ANALYST B466J
PROBE B598G
CAL DUE. 2-9-00

REMARKS: POST DECON OF CONTAMINATED AREA ON CONCRETE PAD. 15424 CPM WITH FIDDLER. AREA DECONNED WITH JACKHAMMER, BKGD = 11018

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 21	Time: ~~1630~~ 1600	Page 1 of
RWP No. 99-004	WORK ORDER No. —	BLDG. No. — 9-21-99	

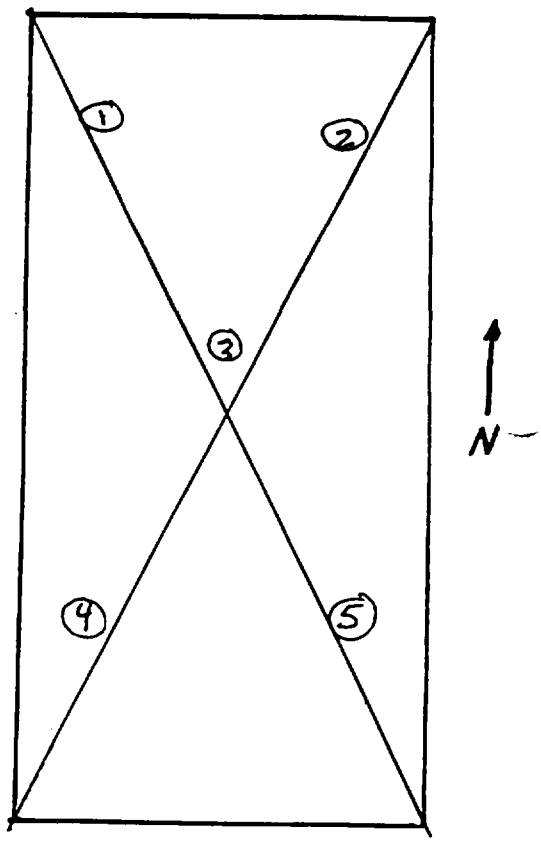
LOCATION: GRID 49 WEST Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd 15737 cpm
walkover 15K TO 20K cpm
1 15371 cpm
2 15644 cpm
3 14913 cpm
4 14014 cpm
5 13585 cpm



REMARKS: All readings < 2 times BKG
Sample ID # 990921601

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: R Zenenberg Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 21	Time: ~~1600~~ 1630	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. 2SB-921-99	

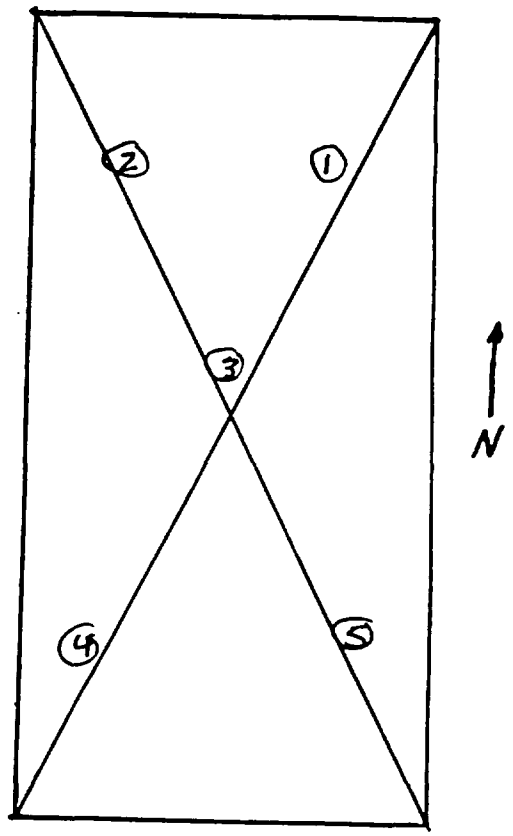
LOCATION: GRID 48 EAST Confirmation Survey

Bicron analyst # B466 J
" G-5 # B598 G

Cal. Due 2-9-00

SKETCH:

Bkgd	17702 cpm
walkover	15K TO 24K cpm
# 1	16029 cpm
# 2	22643 cpm
# 3	14832 cpm
# 4	15303 cpm
# 5	14069 cpm



REMARKS: All readings < 2 times BKg
Sample ID # 990921602

/EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/22/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 22	Time: 1425	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

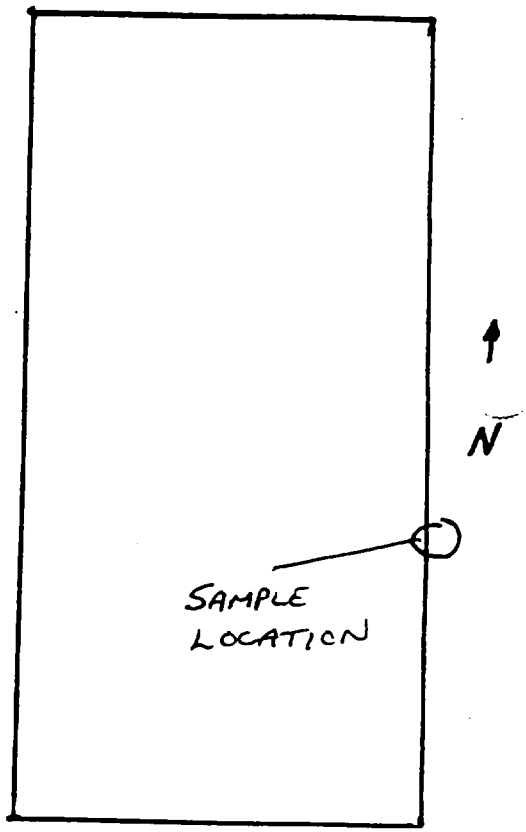
LOCATION: GRID 41 EAST LIMIT

Bicron analyst #A228Z
" G-5 #B588M
Cal. Due 5-14-00

Investigation Survey

SKETCH:

Bkgd	14895	cpm
walkover	15K TO 26K	cpm
# 1	24134	cpm PRE SAMPLE
# 2	23652	cpm POST SAMPLE
# 3	NA	cpm
# 4	/	cpm
# 5	NA	cpm



REMARKS: LARRY JENSEN'S REQUESTED SAMPLE.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis / —

Reviewed by: R Mumbey

Date: 9/24/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy ~~28~~ 22	Time: 1525	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: SOUTH OF CONCRETE PAD Confirmation Survey

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH: LAST AREA SOUTH OF CONCRETE SLAB TO HAVE FIDLER WALKOVER.

BKGD = 15151

WALKOVER 10K TO 20K

FIDLER A 2282
B588M
5-14-00

N. 336.0
E. 901.4

N 368.3
E 1018.7

N 340.4
E 1021.7

N 357.4
E 901.5

REMARKS: All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Lauenberg Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 22	Time: 1600	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

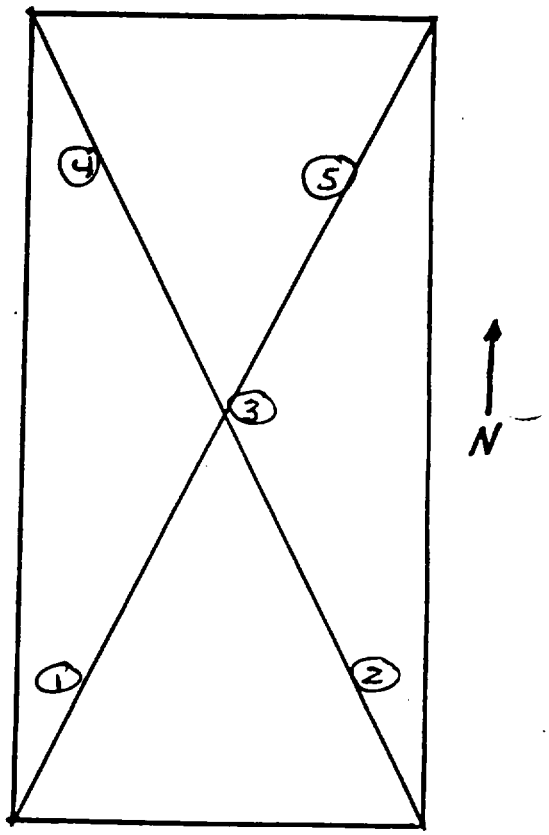
LOCATION: GRID 60 WEST Confirmation Survey

Bicron analyst # B446J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	18537	cpm
walkover	15K TO 25K	cpm
# 1	14330	cpm
# 2	14040	cpm
# 3	13929	cpm
# 4	16771	cpm
# 5	16285	cpm



REMARKS: ELEVATED READING OF 25 K DURING WALKOVER DUE TO CLOSE PROXIMITY OF UNEXCAVATED AREA.
Sample ID # 990922602
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] / —

Reviewed by: [signature] Date: 9/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 23	Time: 1145	Page 1 of 1
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

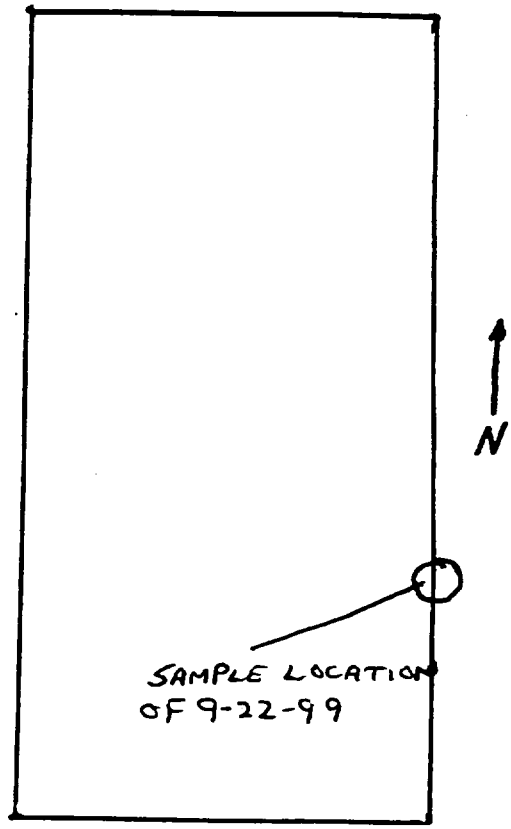
LOCATION: GRID 41 EAST

Bicron analyst # A228Z
" G-5 # B588M
Cal. Due 5-14-00

Investigation Survey

SKETCH:

Bkgd	15377 ~~17918~~ 9-23-99	cpm
walkover	15K TO 25K	cpm
# 1	24092	cpm 5' NORTH
# 2	20801	cpm 15' NORTH
# 3	19120	cpm 30' NORTH
# 4	NA	cpm
# 5	NA	cpm



REMARKS: READINGS 1-3 TAKEN AT INTERVALS FROM SAMPLE LOCATION.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 9/24/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 24	Time: 0915	Page 1 of
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

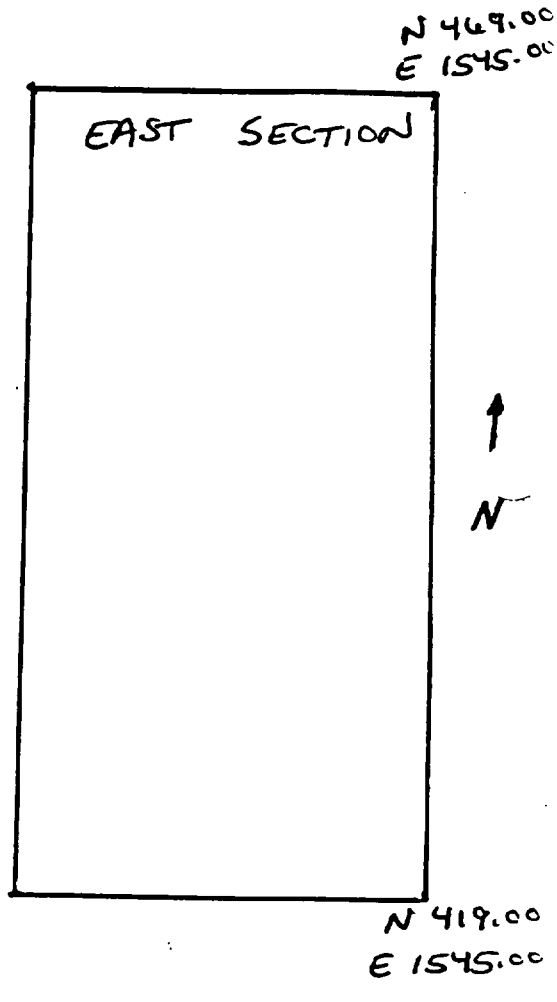
LOCATION: GRID LOCATION EAST OF GRID 41 EAST SECTION OF GRID

Bicron analyst #B446J
" G-5 #B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	13208	cpm
walkover	12K TO 15K	cpm
# 1	NA	cpm
# 2		cpm
# 3		cpm
# 4		cpm
# 5	NA	cpm



REMARKS: Confirmation Survey
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zeuenberger

Date: 9/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

.TE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 24	Time: 0925	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

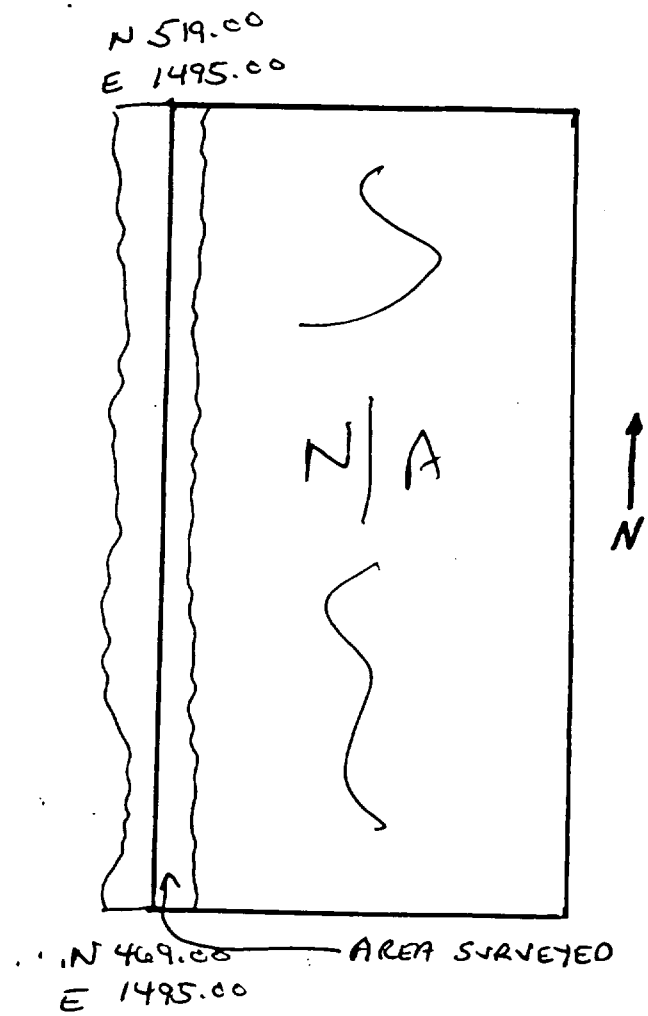
LOCATION: GRID 54 WEST BOUNDARY

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	10503	cpm
walkover	10K TO 12K	cpm
# 1	NA	cpm
# 2		cpm
# 3		cpm
# 4		cpm
# 5	NA	cpm



REMARKS: Confirmation Survey
All readings < 2 times Bkg

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: ____ / ____ / ____

Reviewed by: R Sennberger

Date: 9/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 24	Time: 0940	Page 1 of
RWP No. 99-004	WORK ORDER No.	BLDG. No.	

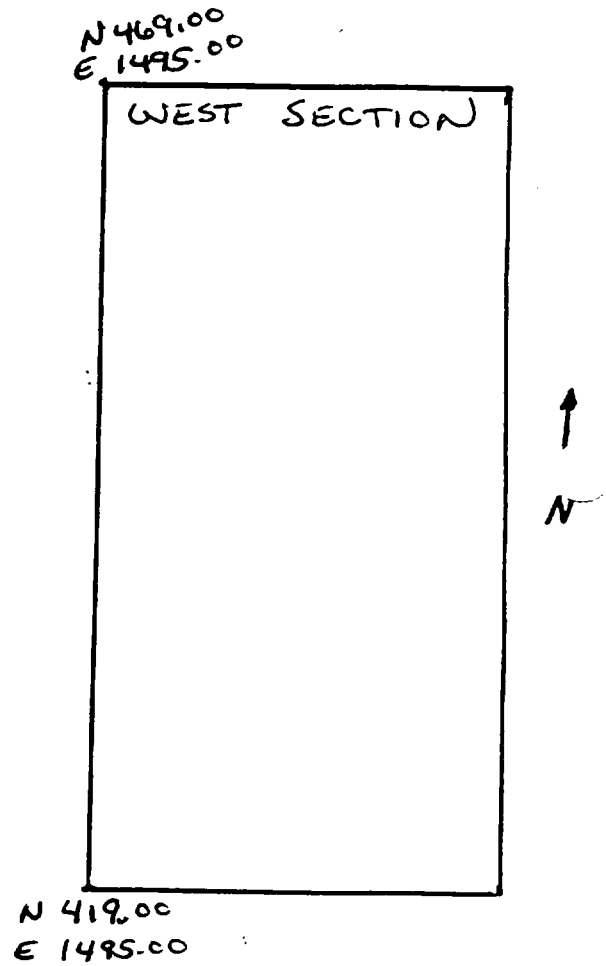
LOCATION: GRID LOCATION EAST OF GRID 41 WEST SECTION OF GRID

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	13496	cpm
walkover	12K TO 15K	cpm
# 1	NA	cpm
# 2		cpm
# 3		cpm
# 4		cpm
# 5	NA	cpm



REMARKS: Confirmation Survey
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: K Lenenberg

Date: 9/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 25	Time: 1130	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: HOT SPOT AT N.W. CORNER LOCATION Confirmation Survey

MAP KEY: N/A = SMEAR / LARGE AREA WIPE LOCATION N/A = AIR SAMPLE LOCATION

SKETCH:

N 294.5
E 817.4

N 294.2
E 820.5

N 290.5
E 818.5

N 296.9
E 820.8

AREA BETWEEN THESE POINT; HOT SPOT REMAINING 38801

N 214.8
E 814.4 → N 290.5
E 818.5

BKGD = 14442
WALKOVER 15K TO 18K

FIDLER B4UUJ
B598G
2-9-00

REMARKS: All readings < 2 times Bkg except Hot Spot measurement. Hot Spot will be remediated at a future time.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: R [signature] Date: 10/6/99

Millennium MRP Remediation Project
Radiological Surveillance Summary Report
for
Work Week of 9/27/99 – 10/2/99

Grid Surveys				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results[2]** (pCi/g; Ra-226&Ra-228)	**Comments**
81	9/27/99	<2 X Bkg	<1.9[3]	
40 North	9/29/99	<2 X Bkg	3.5	
54 N.E.	9/29/99	<2 X Bkg	<2.1[3]	
61 East	10/1/99	<2 X Bkg	4.0	
61 West	10/1/99	<2 X Bkg	3.6	
80 South	10/1/99	<2 X Bkg	3.1	
80 North	10/1/99	<2 X Bkg	3.3	
79 East	10/1/99	<2 X Bkg	3.5	
79 West	10/1/99	<2 X Bkg	6.4	
83 West	10/1/99	<2 X Bkg	3.0	
62 West	10/2/99	<2 X Bkg	3.1	Survey includes portion of Grid 93
62 East	10/2/99	<2 X Bkg	5.7	
West ½ of 83 S.	10/2/99	<2 X Bkg	2.4	
53, 55, 56, 57, 58, 59	9/29/99	<2 X Bkg	NA	Area between Excavation and Flood Plain
North End of Cement Pad	9/27/99	<2 X Bkg	NA	Elevated readings, measured the previous work week have been remediated.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 27	Time: 1010	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: NORTH SECTION OF CONCRETE SLAB (POST DECON) Confirmation Survey

MAP KEY: NA = SMEAR / LARGE AREA WIPE LOCATION NA = AIR SAMPLE LOCATION

SKETCH:

BACKGROUND 11911

WALKOVER 12K TO 18K

FIDLER: ANALYST B466J
PROBE B598G
CAL-DUE 2-9-00

REMARKS: WALKOVER OF IDENTIFIED CONTAMINATED AREAS ONLY.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

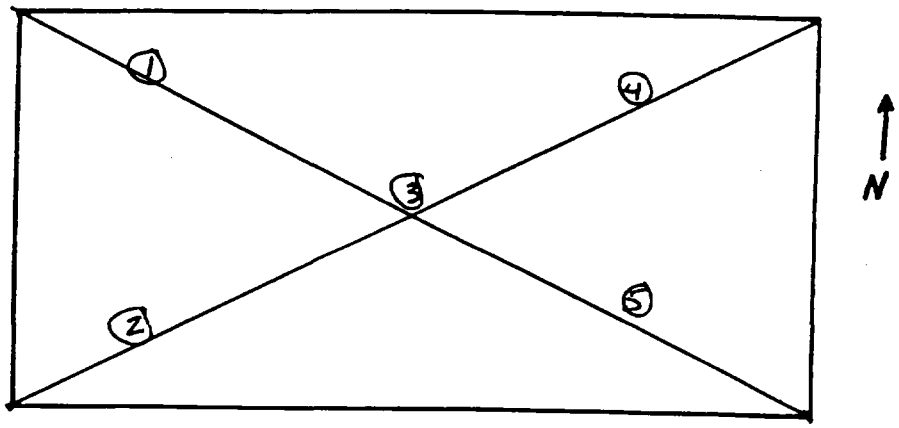
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 27	Time: 1415	Page 1 of 7
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 81 Confirmation Survey

Bicron analyst #B466J
" G-5 #B598G

Cal Due 2-9-00

SKETCH:



Bkgd	17744	cpm
walkover	~~16106~~ JJ 9-27-99 17K TO 22K	cpm
#1	16106	cpm
#2	16610	cpm
#3	16624	cpm
#4	14443	cpm
#5	16798	cpm

REMARKS: All readings < 2 times Bkg
Sample ID# 990927601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Zlenberg Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

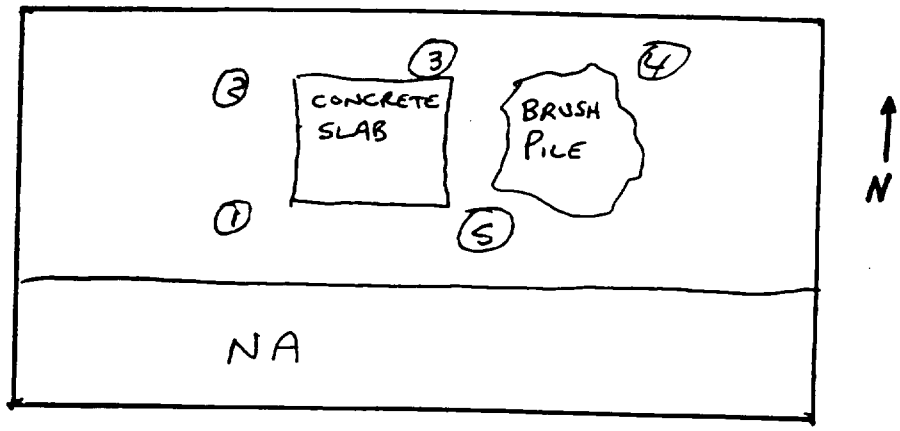
SITE: MILLENIUM	DATE: Yr 99 Mo 09 Dy 29	Time: 1007	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 40 NORTH

Bicron analyst #B466J
" G-5 # B598G
Cal Due 2-9-00

sampling → Inst.
Bicron B441G G-5
Cal Date → 5-14-00 B668V

SKETCH:



BKgd 15002 cpm
walkover 12K TO 18K cpm
#1 12533 cpm
#2 12,363 cpm
#3 11,997 cpm
#4 12,227 cpm
#5 11,989 cpm

REMARKS: Sample ID # 990929602

9-29-99 Sampled by [illegible]

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [illegible] / —
David [illegible] / [illegible] / [illegible] / [illegible]

Reviewed by: [illegible] Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 9 Dy 29	Time: 1015	Page ___ of ___
RWP No. N/A	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 54 N/E

MAP KEY: O = SMEAR / LARGE AREA WIPE LOCATION ☐ = AIR SAMPLE LOCATION

Inst B441G 5-14-00 G-5 B668✓ → sampling

SKETCH: Confirmation Survey Note: completed survey prior to back fill. See log entry. D.E. ↑ N

Sample

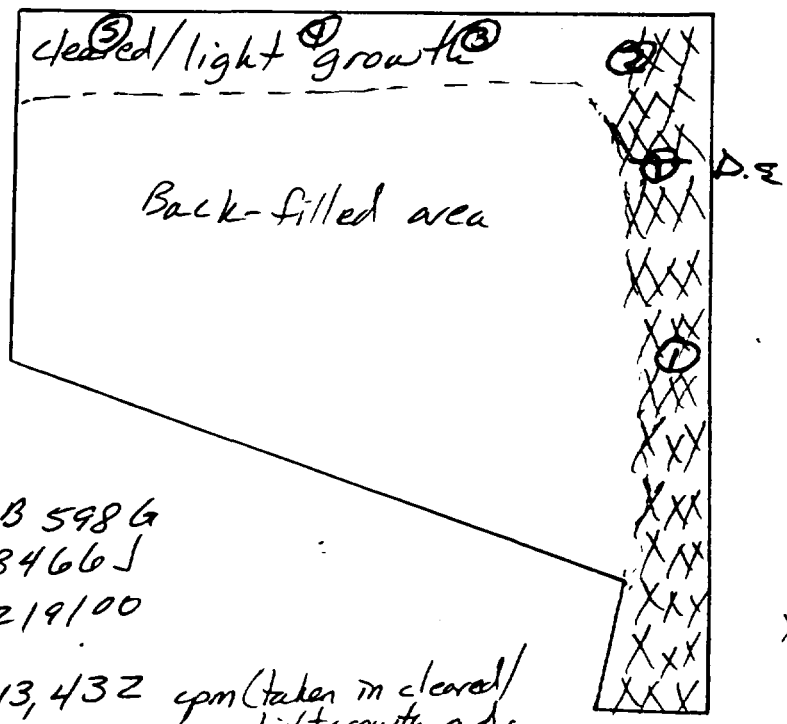
#1 11,999

#2 11,899

#3 12,001

#4 12143

#5 12,222



Bicron G5 B598G
Bicron Analyst B466J
Cal due 2/9/00

Background 13,432 cpm (taken in cleared/light growth and backfilled areas)
Walkover 12-18,000 cpm (in all three areas)

XXX - heavy growth/brush

Sample ID # 990929601

REMARKS: Some standing water on Backfilled and cleared/light growth area. Very muddy with continuing light rain during survey. Readings in heavy growth/brush area were spot readings where brush was removable by hand/foot.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] / David Essen / [signature] / / /

Reviewed by: R Zimmerberg Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 9 Dy 29	Time: 1130	Page 1 of 1
RWP No. N/A	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: See below in Description

PURPOSE OF SURVEY: Confirmation survey of area between floodplain and excavation

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
B466J	2/9/00	— / —	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☒ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
1	Area between excavation					12-18,000 cpm
	and floodplain markers in					except at floodplain
	53, 55, 56, 57, 58, 59 Grids					markers in 57, 58, 59
2	Under lines along					20-50,000 cpm
	floodplain markers in					
	57, 58, 59 Grids					

REMARKS: B466J Background - 13,441 cpm

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: [signature] Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1500	Page 1 of —
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

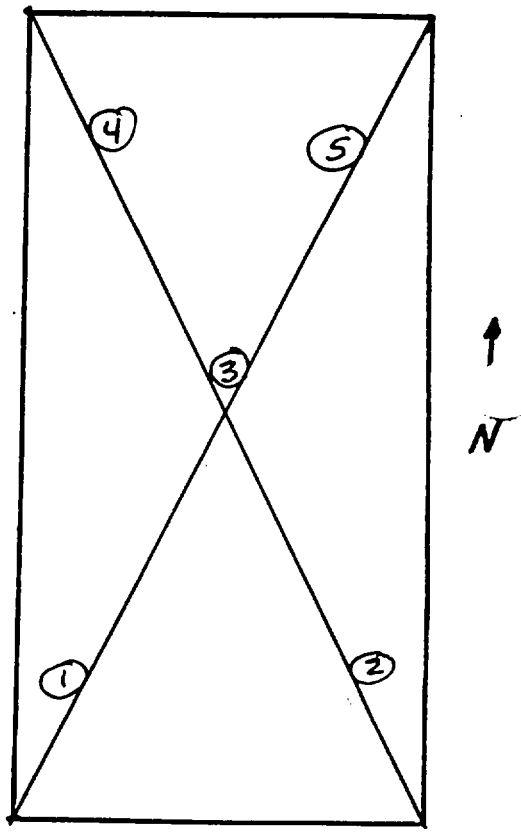
LOCATION: GRID 61 EAST Confirmation Survey

Bicron analyst #A2282
" G-5 #B598M

Cal. Due 5-14-00

SKETCH:

Bkgd	15487 cpm
walkover	15K TO 18 K cpm
# 1	14002 cpm
# 2	12940 cpm
# 3	13500 cpm
# 4	13214 cpm
# 5	15366 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 991001601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: K Zenenberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1600	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

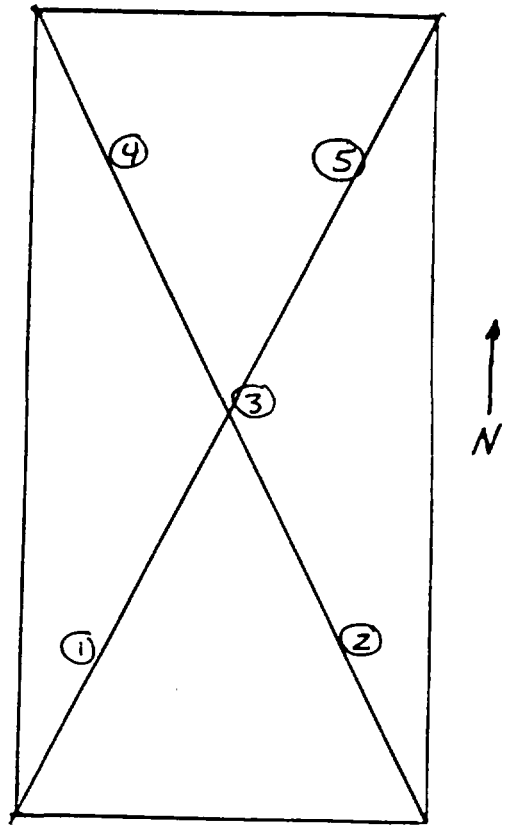
LOCATION: GRID 61 WEST Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	15694 cpm
walkover	15K TO 18K cpm
# 1	14781 cpm
# 2	15934 cpm
# 3	16677 cpm
4	15272 cpm
# 5	13994 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 991001602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis / —

Reviewed by: K Zenenberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

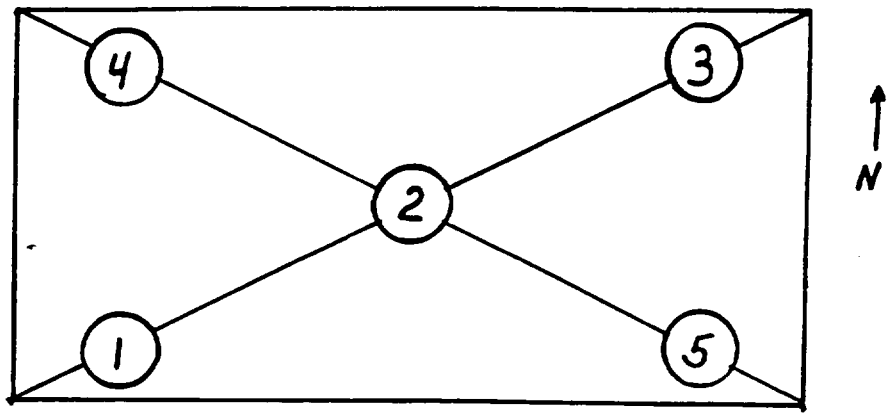
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1603	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 80 south Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



Bkgd	15617	cpm
walkover	13,000 - 20,000	cpm
#1	14633	cpm
#2	14746	cpm
#3	15208	cpm
#4	13957	cpm
#5	14960	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 991001603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 10014

Reviewed by: M Tenenberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

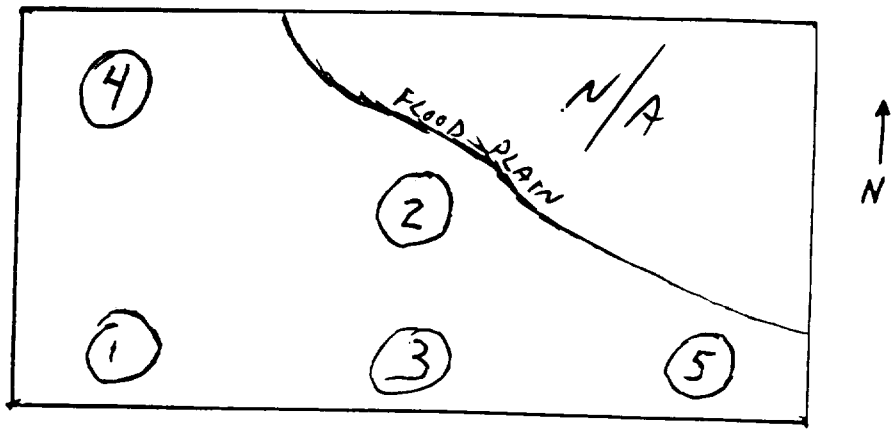
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1648	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No N/A	

LOCATION: 80 north Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd	16 337	cpm
walkover	13 000 - 22 000	cpm
#1	13 361	cpm
#2	15 418	cpm
#3	13 843	cpm
#4	13 470	cpm
#5	17 115	cpm

REMARKS: All readings < 2 times BKg
Sample ID # 991001604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Hirenberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1655	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

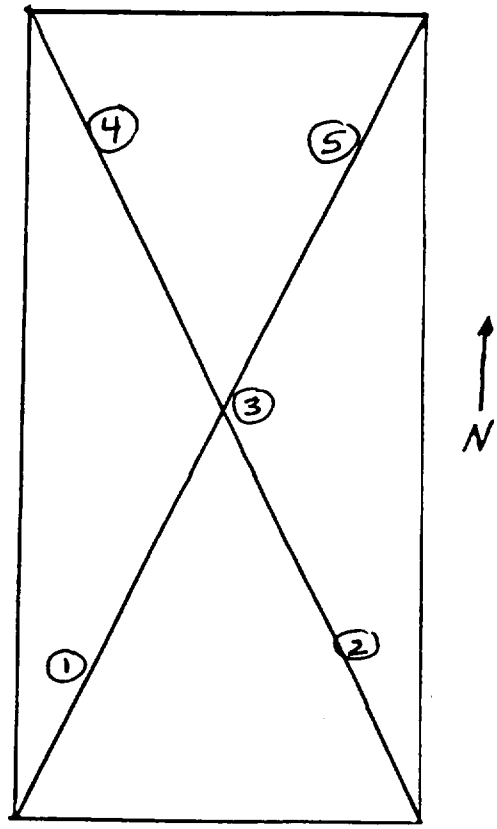
LOCATION: GRID 79 EAST Confirmation Survey

Bicron analyst #B466J
" G-5 #B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	16297	cpm
walkover	15K TO 18K	cpm
# 1	15137	cpm
# 2	15890	cpm
# 3	13402	cpm
# 4	13577	cpm
# 5	13041	cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 91001605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J F Lewis /

Reviewed by: K Zemenberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

.E: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1720	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

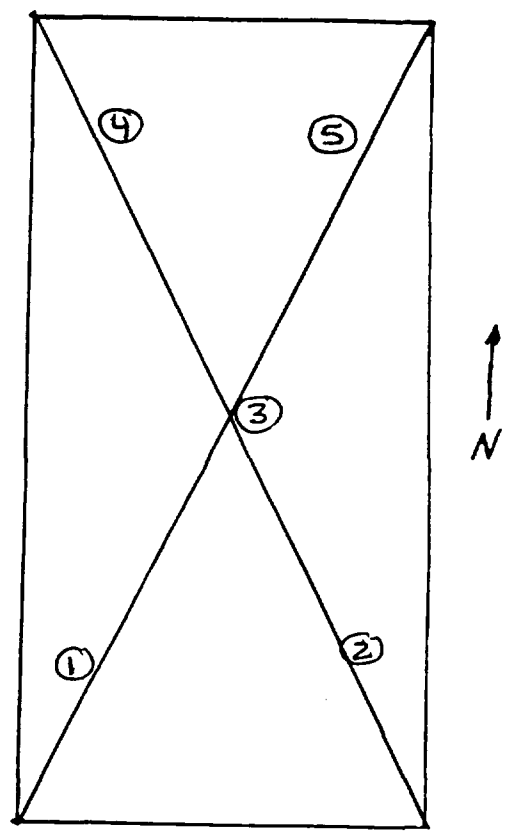
LOCATION: GRID 79 WEST Confirmation Survey

Bicron analyst #B466J
" G-5 # B598G

Cal. Due 2-9-00

SKETCH:

Bkgd	18769 cpm
walkover	16K TO 22K cpm
# 1	20565 cpm
# 2	22241 cpm
# 3	16159 cpm
4	16252 cpm
# 5	14297 cpm



REMARKS: All readings < 2 times Bkg
Sample ID # 991001606

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. Lewis / J Lewis /

Reviewed by: K Lemberg Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

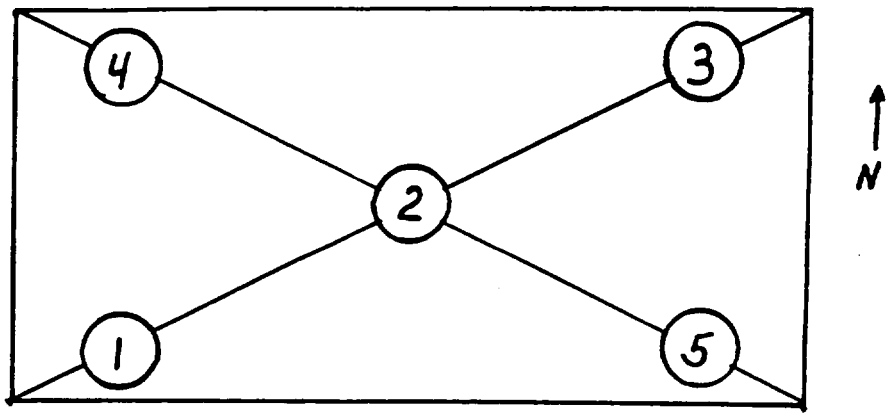
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 01	Time: 1800	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 83 South Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 17330 cpm
walkover 14000 - 24000 cpm
#1 18520 cpm
#2 14762 cpm
#3 14332 cpm
#4 17633 cpm
#5 14285 cpm

REMARKS: All readings < 2 times BKg
Sample ID # 991001607

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 1001.

Reviewed by: R Hamberger Date: 10/2/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo ~~02~~ 10 Dy 02	Time: 1330	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

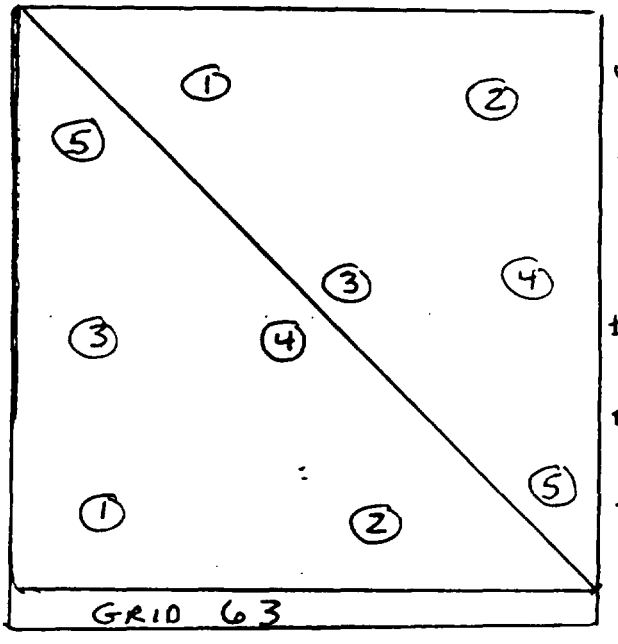
LOCATION: GRID 62 + PARTIAL 63 Confirmation Survey

MAP KEY: N/A SMEAR / LARGE AREA WIPE LOCATION N/A AIR SAMPLE LOCATION ↑ N

SKETCH:

GRID 62 WEST

BKGD 16242
WALKOVER 14K-18K
#1 14697 CPM
2 12204 CPM
#3 16600 CPM
#4 13783 CPM
#5 14939 CPM
Sample ID# 991002602



GRID 62 EAST

BKGD 16688
WALKOVER 16K-22K
#1 17866 CPM
#2 16477 CPM
#3 21375 CPM
#4 14682 CPM
#5 15209 CPM
Sample ID# 991002601

B466J
B598G
2-9-00

REMARKS: GRID 63 INCLUDED WITH GRID 62 WALKOVERS
All readings < 2 times BKG

SL Y TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / [signature] /

Reviewed by: [signature] Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

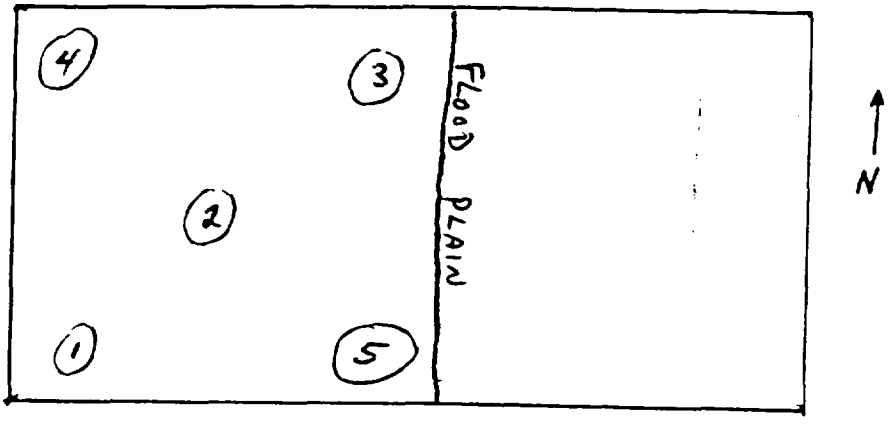
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 02	Time: 1615	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: West 1/2 of 82 South Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



Bkgd	15 091	cpm
walkover	13000 - 18000	cpm
#1	13 427	cpm
#2	13 425	cpm
#3	14 200	cpm
#4	14649	cpm
#5	13737	cpm

REMARKS: All readings < 2 times BKG
Sample ID # 991002603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: [signature] Date: 10/9/99

Millennium MRP Remediation Project
Radiological Surveillance Summary Report
for
Work Week of 10/4/99 – 10/8/99

Grid Surveys				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g; Ra-226&Ra-228)	Comments
64 South	10/4/99	<2 X Bkg	4.2	
64 North	10/4/99	<2 X Bkg	1.8	
78 South	10/4/99	<2 X Bkg	3.5	
78 North	10/5/99	<2 X Bkg	7.9	Hot Spots were detected and Remediated prior to survey.
65 North	10/5/99	<2 X Bkg	3.7	
63 North	10/5/99	<2 X Bkg	3.0	
84 South	10/5/99	<2 X Bkg	3.8	Hot Spots were detected and Remediated prior to survey.
72 East	10/8/99	<2 X Bkg	<1.9[3]	
71 North	10/8/99	<2 X Bkg	3.4	
70 South	10/8/99	<2 X Bkg	3.0	
69 North	10/8/99	<2 X Bkg	3.3	
68 South	10/8/99	<2 X Bkg	2.7	
67 North	10/8/99	<2 X Bkg	4.4	
66 South	10/8/99	<2 X Bkg	2.9	
77 South	10/8/99	<2 X Bkg	4.1	
66 North	10/8/99	<2 X Bkg	3.4	
76 North	10/8/99	<2 X Bkg	3.2	
77 North	10/8/99	<2 X Bkg	3.5	
75 North	10/8/99	<2 X Bkg	4.4	
76 South	10/8/99	<2 X Bkg	2.9	
68 North	10/8/99	<2 X Bkg	3.0	
75 South	10/8/99	<2 X Bkg	3.3	
70 North	10/8/99	<2 X Bkg	4.1	
N.W. Corner of Parking Lot	10/6/99	<2 X Bkg	NA	Elevated readings, measured during work week beginning 9/20/99 have been remediated.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

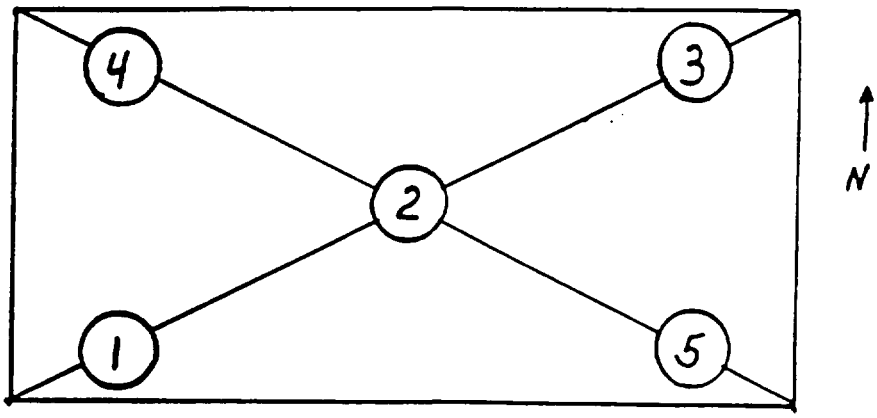
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 04	Time: 1853	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 64 South Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



Bkgd	16 889	cpm
walkover	15000-18000	cpm
#1	16 884	cpm
#2	15 519	cpm
#3	15 202	cpm
#4	16 339	cpm
#5	16 645	cpm

REMARKS: All readings < 2 times Bkg

Sample ID # 991004601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: K Heuenberger

Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

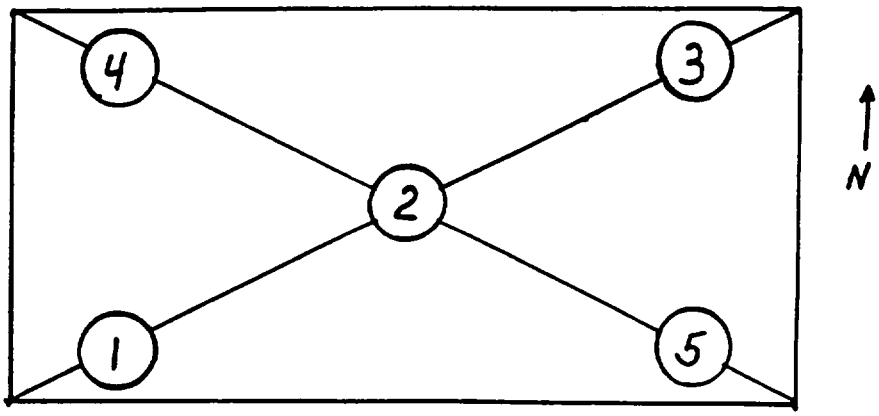
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 04	Time: 1922	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A

LOCATION: G4 North Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd	16 861	cpm
walkover	15000 - 20000	cpm
#1	15 545	cpm
#2	15 124	cpm
#3	14 304	cpm
#4	15 510	cpm
#5	16 297	cpm

REMARKS: All readings < 2 times BKg
Sample ID # 991004602, 991004603 (Dup)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee /

Reviewed by: R Leuenberger Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 04	Time: 1930	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA	

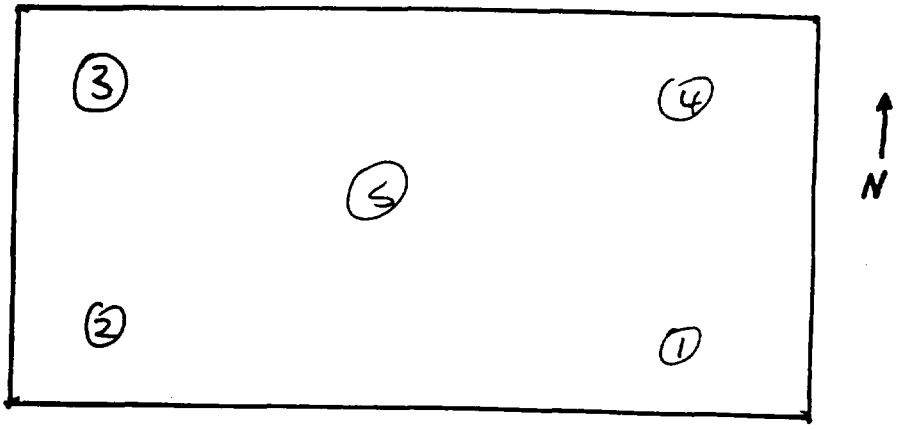
LOCATION: GRID 78 South Confirmation Survey

Bicron analyst # B466J
" G-5 # B 598G

Cal Due 2-9-00

SKETCH:

Confirmation Survey



Bkgd	17,500	cpm
walkover	13k - 23k	cpm
#1	13,581	cpm
#2	17,366	cpm
#3	19702	cpm
#4	14,444	cpm
#5	15,561	cpm

REMARKS: B.P.E. All Reading < 1.5 x Bkgd D. Eat
Sample ID #991004604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID EATON / Dal Eat / 100163

Reviewed by: R Henderson Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 04	Time: 1945	Page 1 of 1
RWP No. 99004	WORK ORDER No. NA	BLDG. No. NA	

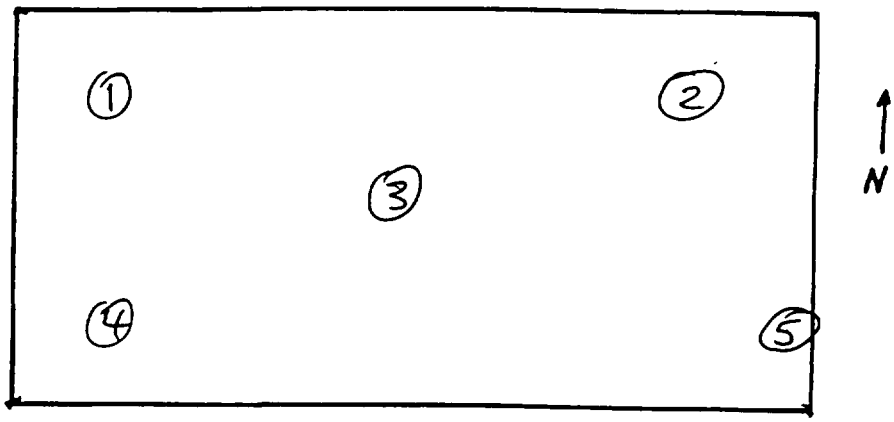
LOCATION: GRID 78 North Confirmation Survey

Bicron analyst # B4665
" G-5 # B5986

Cal Due 2-9-00

SKETCH:

Confirmation Survey



Bkgd	18,000	cpm
walkover	15K - 36K	cpm
#1	18,412	cpm
#2	16,371	cpm
#3	16,381	cpm
#4	17,203	cpm
#5	36,211	cpm

Sample ID # 991004605

REMARKS: Note: Sample #5 >2xBkgd; Request a Re-Dig of this area. Briefed Tim Bi on Hot area. All readings < 2 times Bkg. See follow-up survey performed 10/5/99

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: DAVID SATON / [signature] / 100163

Reviewed by: [signature] Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

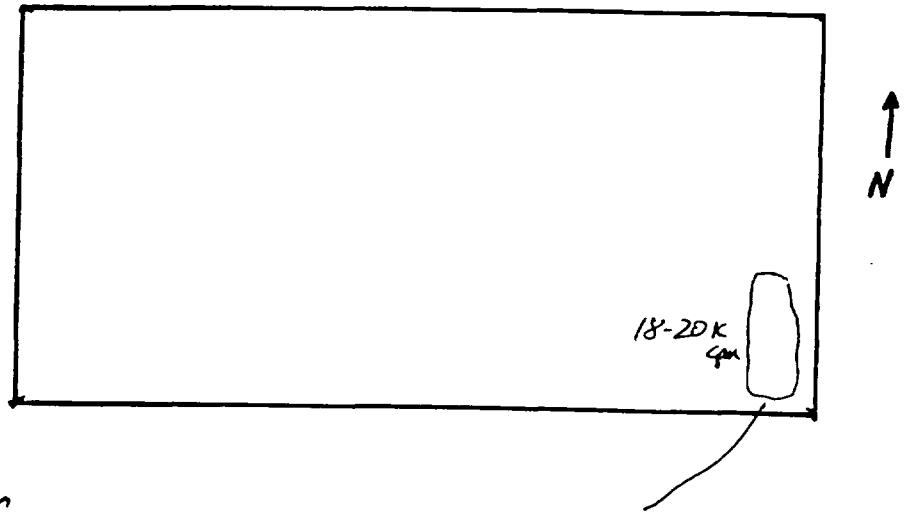
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 5	Time: 1140	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 78 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	18,000	cpm
walkover	18-20,000	cpm
#1	N/A	cpm
#2		cpm
#3		cpm
#4		cpm
#5	N/A	cpm

Hot Spot area removed. Walkover indicated 18-20,000 cpm in and around additional excavation (Background levels)

REMARKS: Reference survey of 10/4/99 1945 for original survey
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Tennberg

Date: ~~12~~ 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

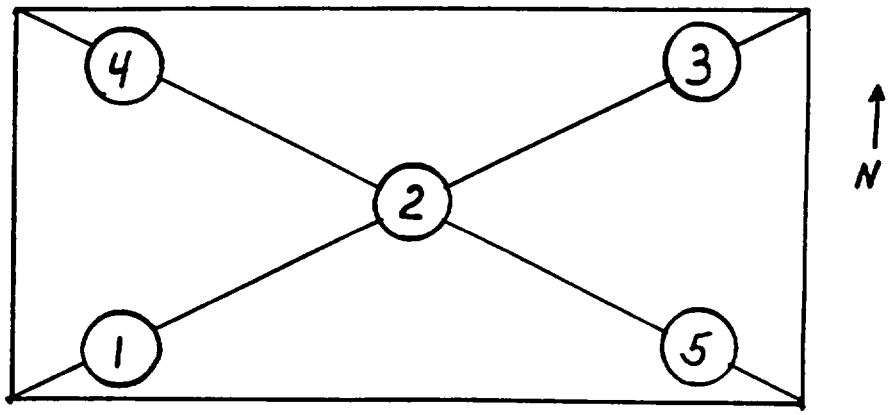
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 5	Time: 8950	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 65 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd 18,157 cpm
walkover 15-20,000 cpm
#1 16,046 cpm
#2 15,096 cpm
#3 14,767 cpm
#4 15,598 cpm
#5 14,731 cpm

REMARKS: Approximate grid size 8' x ~~25'~~ 50' DWJ 10/5/99
All readings < 2 times Bkg
Sample ID# 991005602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Huerbert Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

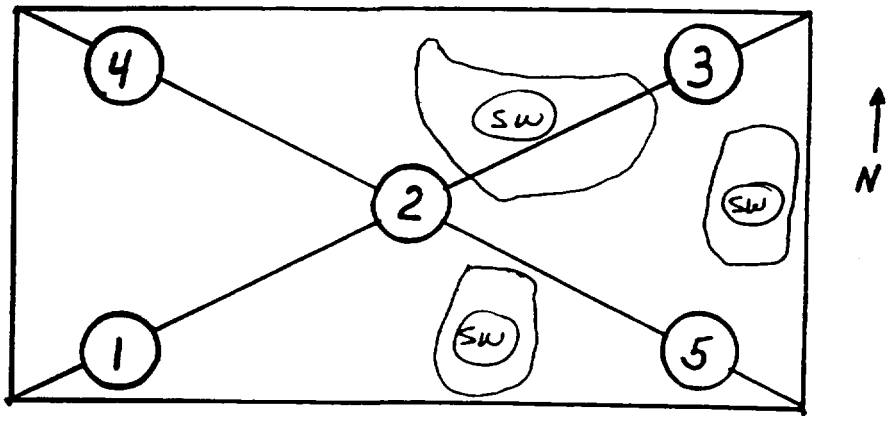
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 5	Time: 0900	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 63 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	13,822	cpm
walkover	12-15,000	cpm
#1	15,798	cpm
#2	11,338	cpm
#3	13,327	cpm
#4	14,381	cpm
#5	11,873	cpm

REMARKS: Approximate grid size 8' x ~~25'~~ 50' DM 10/5/99. Standing water designated by SW
All readings < 2 times Bkg
Sample ID # 991005b01

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Lewenbey Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

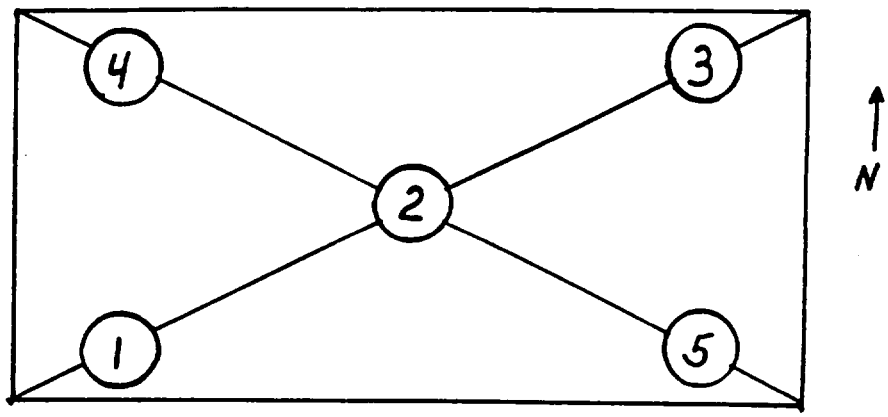
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 5	Time: 1040	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 84 S Confirmation Survey

Bicron analyst # B466 J
" G-5 # B598 G

Cal Due 2/9/00

SKETCH:



BKgd 19,450 cpm
walkover 18-22,000 cpm
#1 16,865 cpm
#2 17,550 cpm
#3 16,630 cpm
#4 19,065 cpm
#5 16,389 cpm

REMARKS: Hotspots reading 40,000 cpm were removed near (5) and (4) prior to sampling.
All readings < 2 times BKg
99100 5603 (Sample ID #)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Jennings Date: 10/6/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

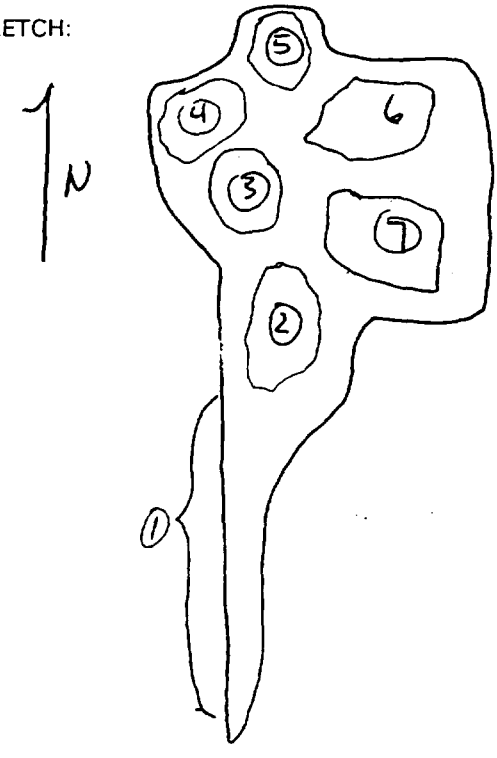
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 6	Time: 1400	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: NW corner of proposed parking lot. Confirmation Survey

MAP KEY: O = ~~SMEAR / LARGE AREA WIPE~~ Radiation Reading LOCATION ☐ = AIR SAMPLE LOCATION

SKETCH:



1. 28,000 cpm
2. 100,000 cpm
3. 300,000 cpm
4. 60,000 cpm
5. 40,000 cpm
6. 80,000 cpm
7. 40,000 cpm

Above readings were the approximate maximum readings prior to remediation. After remediation no readings above 25,000 cpm were ~~35~~ 36 found. Readings 1 and 2 were taken on 10/2/99 and remediated. Readings 3-7 were taken and the area remediated to below 25,000 cpm on 10/6/99.

Instrument Bicron Analyst B466J
Bicron G5 detector B598G
Cal due 2/9/00

REMARKS: G5 Background 19,441 cpm
All post remediation readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

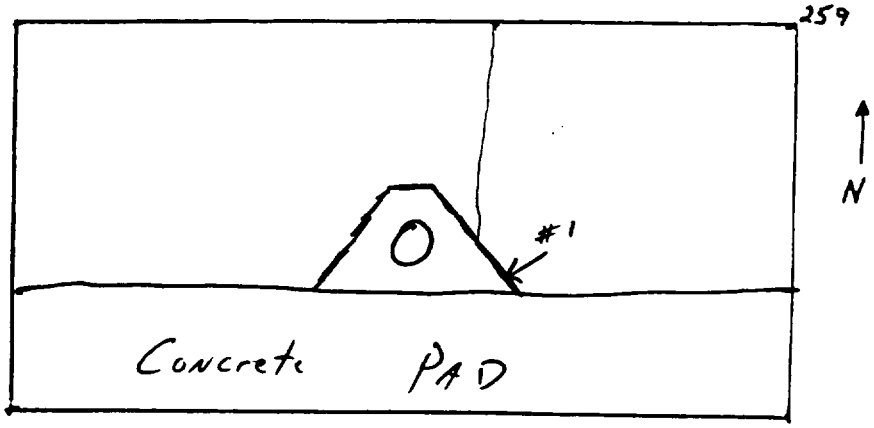
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1200	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Under Slab East 1/2 of 73 North

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 17255 cpm
walkover N/A cpm
#1 57032 cpm
#2 N/A cpm
#3 cpm
#4 cpm
#5 N/A cpm

REMARKS: 991008L01

Hot Spot (#1) was sampled and left in place for future evaluation.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zemenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1401	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

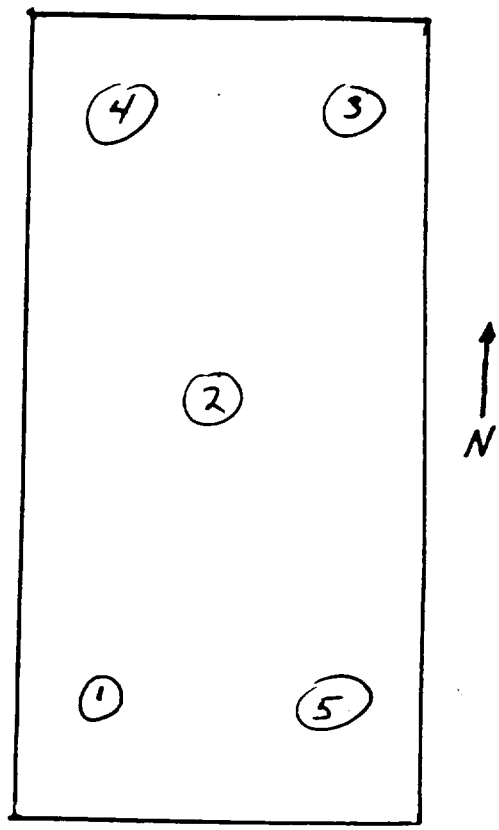
LOCATION: 72 East Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	17024 cpm
walkover	15000 - 18000 cpm
# 1	14600 cpm
# 2	16015 cpm
# 3	15 887 cpm
4	15733 cpm
# 5	15 573 cpm



REMARKS: # 991008602 (Sample ID)

All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: K Jenenberger

Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

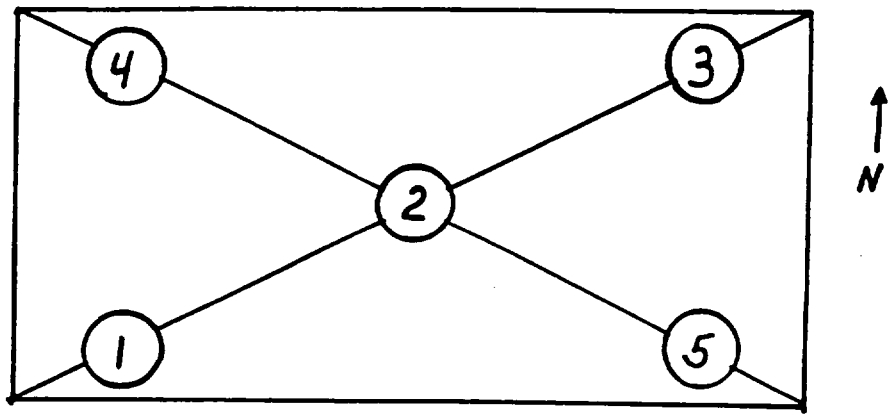
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1405	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 71 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd 14397 cpm
walkover 14-18,000 cpm
#1 12,684 cpm
#2 12,244 cpm
#3 13,831 cpm
#4 16,411 cpm
#5 14,635 cpm

REMARKS: All readings < 2 times Bkg

Sample ID # 991008603

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Heuenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

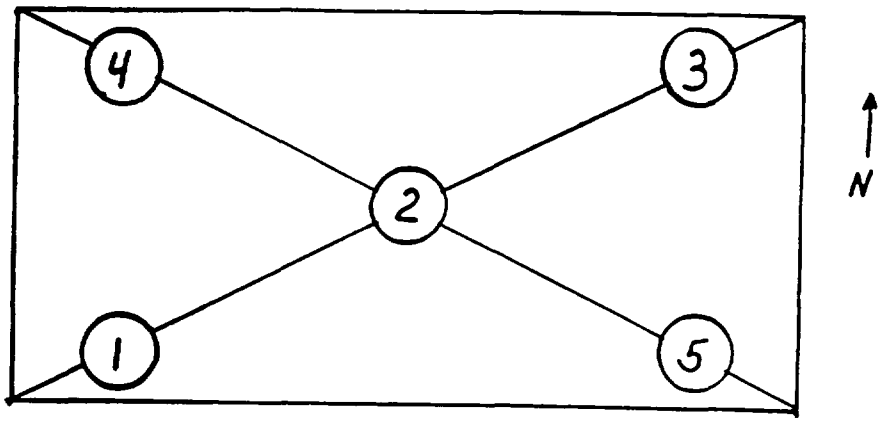
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1438	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 70 South Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 15 338 cpm
walkover 13000-17000 cpm
#1 13 918 cpm
#2 13 925 cpm
#3 15 339 cpm
#4 14 069 cpm
#5 13 096 cpm

Sample ID # 991008604
REMARKS:
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakesleo / T. Blakesleo / 100141

Reviewed by: R Jenenbeyer Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

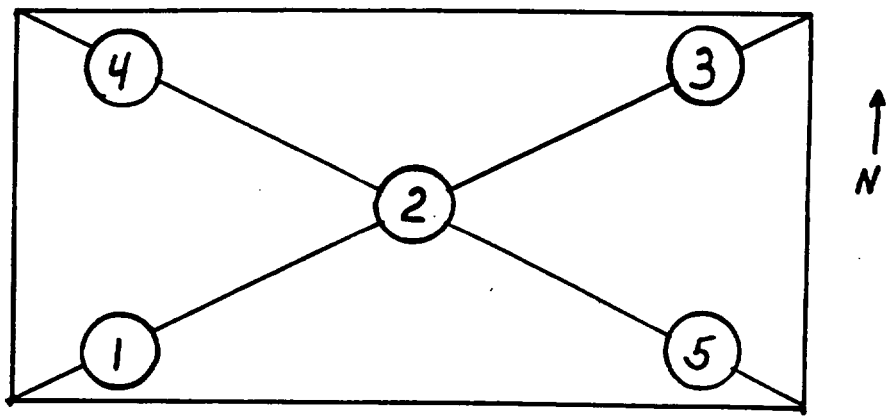
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1450	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. NA	

LOCATION: Grid 69 North Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	14974	cpm
walkover	14-18,000	cpm
#1	12,940	cpm
#2	15,662	cpm
#3	13,703	cpm
#4	14,941	cpm
#5	12476	cpm

REMARKS: All readings < 2 times Bkg

Sample ID # 991008605

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zinenberger

Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

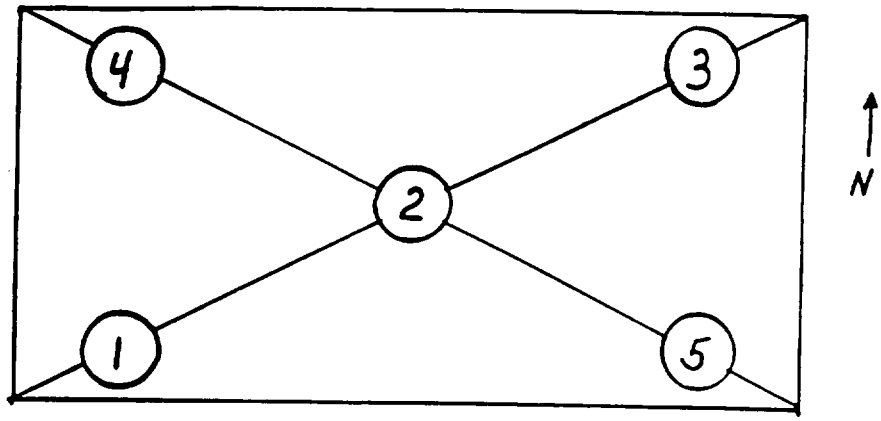
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1520	Page ___ of ___
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 68 South Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 15 281 cpm
walkover 14000 - 17000 cpm
#1 14086 cpm
#2 13917 cpm
#3 14 882 cpm
#4 14 220 cpm
#5 14 728 cpm

REMARKS: #991008606 (Sample ID)
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R. Zenenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

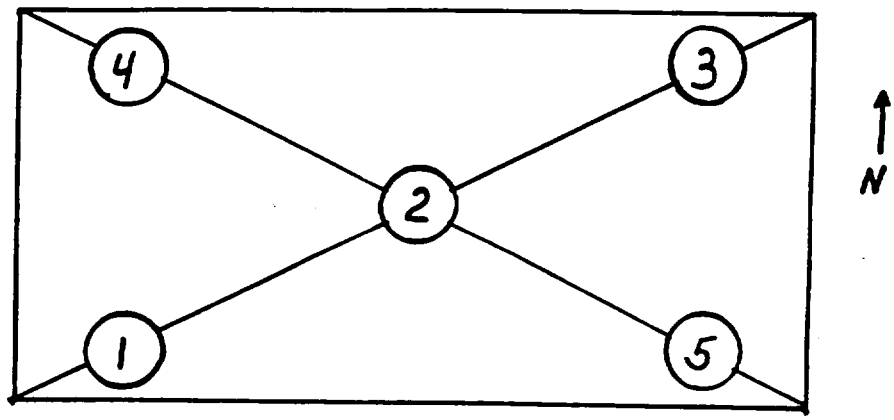
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1550	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 67 N Confirmation Survey

Bicron analyst # B4661
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



BKgd 16,797 cpm
walkover 14-20,000 cpm
#1 14940 cpm
#2 14555 cpm
#3 14687 cpm
#4 13,916 cpm
#5 14,727 cpm

REMARKS: All readings < 2 times BKg
Sample ID # 991008608

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zenenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

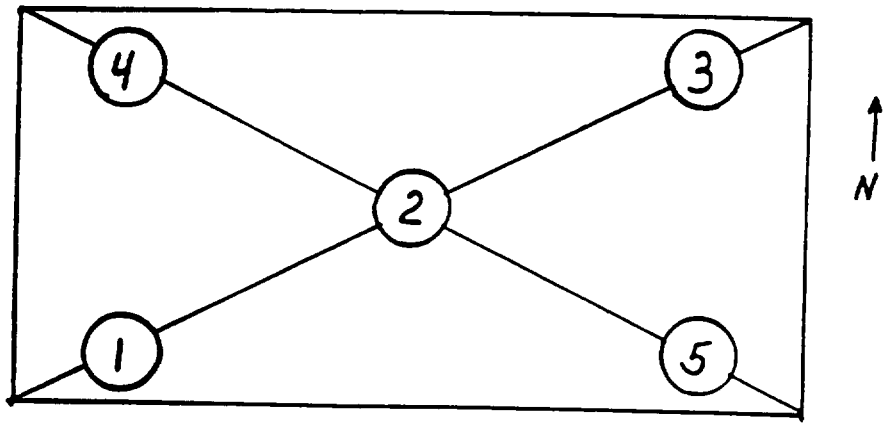
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1610	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 66 South Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



Bkgd	15 840	cpm
walkover	15000 - 17000	cpm
#1	14 944	cpm
#2	14832	cpm
#3	14719	cpm
#4	15366	cpm
#5	15127	cpm

REMARKS: # 991008607 (Sample ID)
All readings < 2 times Bkg

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zenenberger Date: 10/12/99

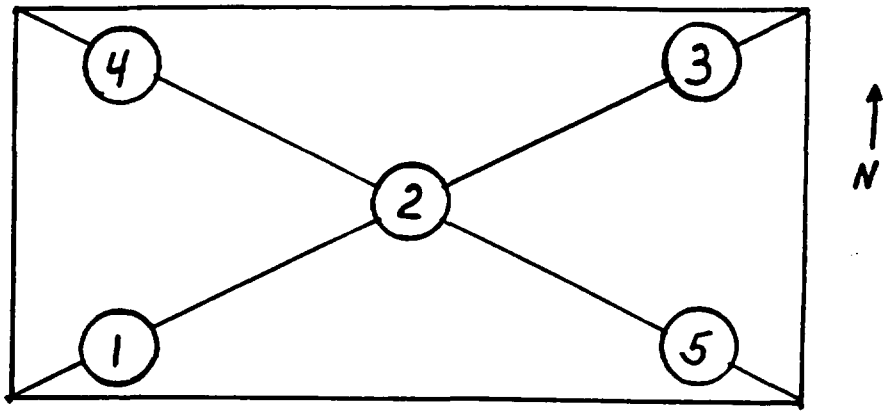
MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1240	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 77 South Confirmation Survey
Bicron analyst # B466J
" G-5 # B598G
Cal Due 2/9/00

SKETCH:



Bkgd 14,439 cpm
walkover 12,000 - 16,000 cpm
#1 14,575 cpm
#2 13,863 cpm
#3 13,858 cpm
#4 14,264 cpm
#5 13,456 cpm

REMARKS: Sampled by J. Lewis
Sample ID# 991008610
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Henenberg Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

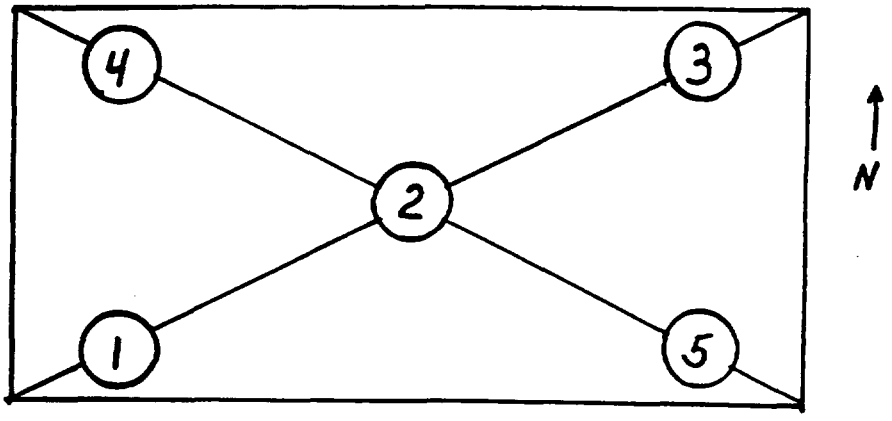
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1745	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 66N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	14,514	cpm
walkover	12-16,000	cpm
#1	13,472	cpm
#2	13,914	cpm
#3	14,285	cpm
#4	12,687	cpm
#5	13,577	cpm

REMARKS: Sampled by T. Blakeslee
Sample ID# 991008609
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Zenenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

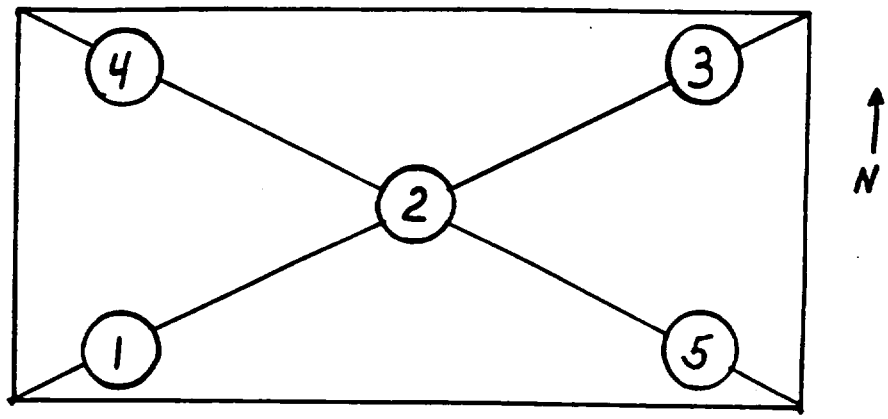
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1755	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 76 North Confirmation Survey

Bicron analyst #B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



BKgd 15,018 cpm
walkover 12-16,000 cpm
#1 12733 cpm
#2 14851 cpm
#3 14244 cpm
#4 11512 cpm
#5 13640 cpm

REMARKS: Sampled by J. Lewis.
Sample ID # 991008012
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R. Blackburn Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

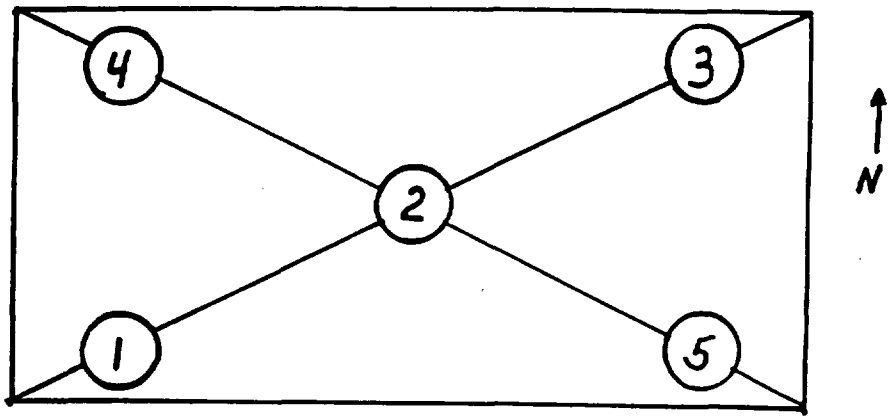
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1756	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 77 North Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	15,079	cpm
walkover	14,000 - 18,000	cpm
#1	13,879	cpm
#2	14,224	cpm
#3	13,991	cpm
#4	14,143	cpm
#5	13,685	cpm

REMARKS: Sampled by T. Blakeslee.
Sample ID# 991008011
All readings < 2 times bkg

JRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Jerenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

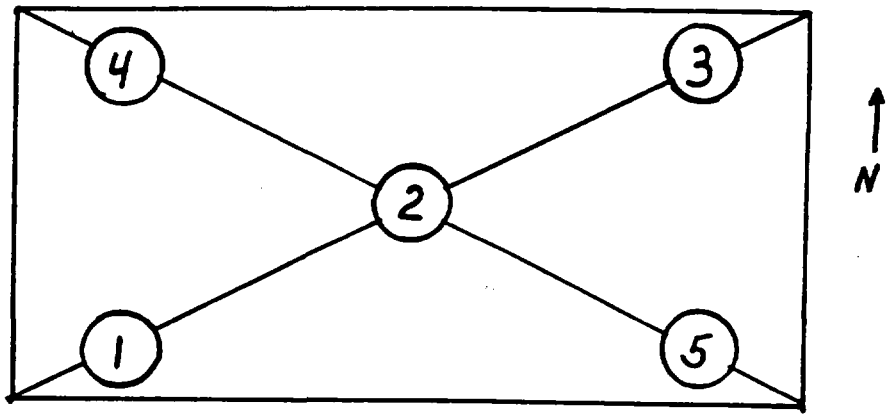
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1810	Page 1 of 7
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 75 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	15,863	cpm
walkover	14-20,000	cpm
#1	14,946	cpm
#2	14,617	cpm
#3	14,361	cpm
#4	14,359	cpm
#5	14 509	cpm

REMARKS: All readings < 2 times Bkg

Sample ID # 991008613

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: K [signature] Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

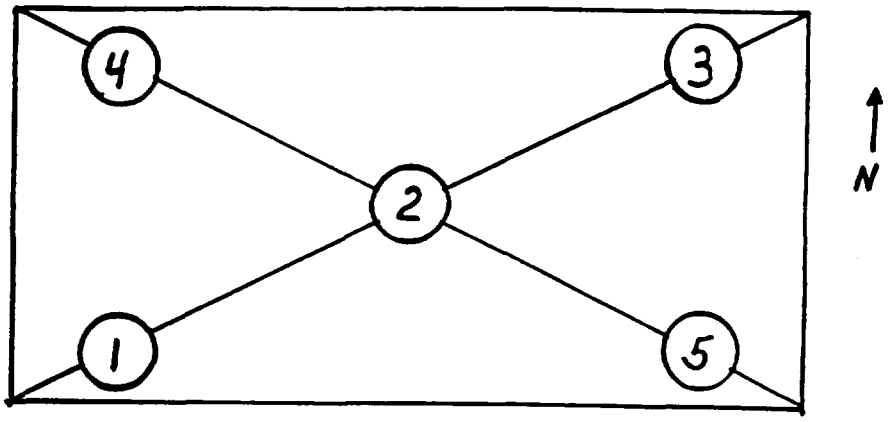
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1818	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 76 South Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	15,976	cpm
walkover	12-18,000	cpm
#1	14,181	cpm
#2	14,262	cpm
#3	13,941	cpm
#4	14,794	cpm
#5	12,790	cpm

REMARKS: Sampled by T. Blakeslee
Sample ID # 991008614
All readings < 2 times BKg

JRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Hirenberger

Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

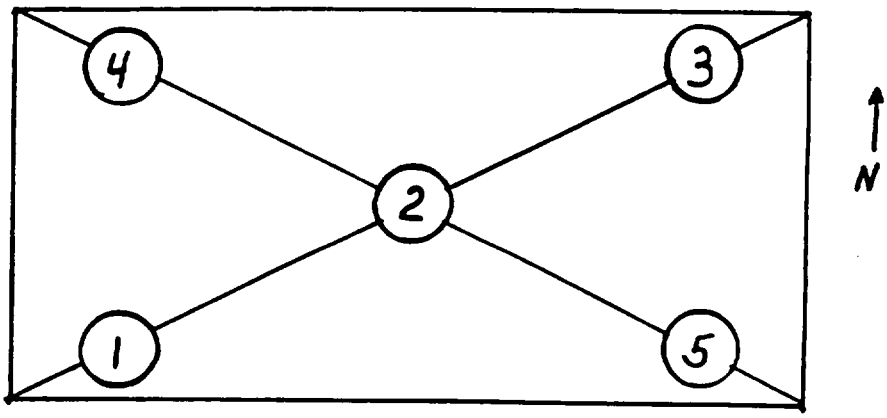
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1830	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 68 N Confirmation Survey

Bicron analyst # B466 J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



BKgd 14,573 cpm
walkover 12-16,000 cpm
#1 14,815 cpm
#2 14,907 cpm
#3 13,299 cpm
#4 14,052 cpm
#5 13 792 cpm

REMARKS: Sampled by J. Lewis
Sample ID #s: 99100 8615, 99100 8616 Dup
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Jernigan Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

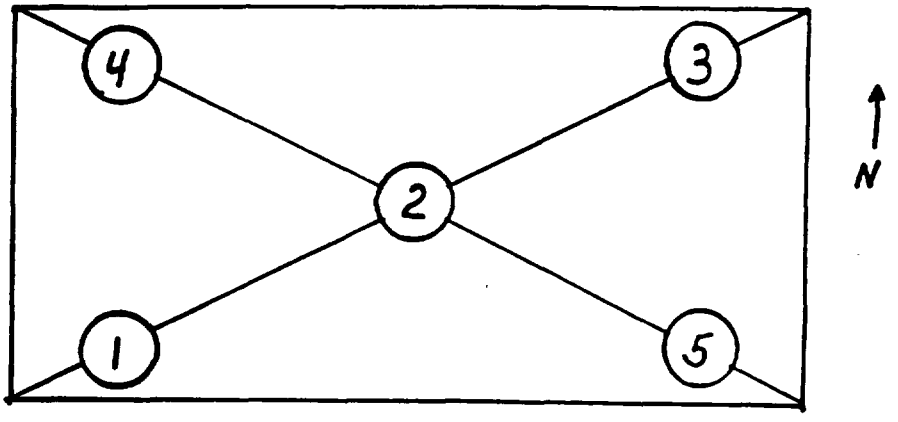
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1847	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 75 South Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	15,235	cpm
walkover	12-18,000	cpm
#1	14232	cpm
#2	14,534	cpm
#3	14,364	cpm
#4	14,721	cpm
#5	14,292	cpm

REMARKS: Sampled by T. Blakeslee.
Sample ID# 991008817
All readings < 2 times Bkg

IRVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Hornberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

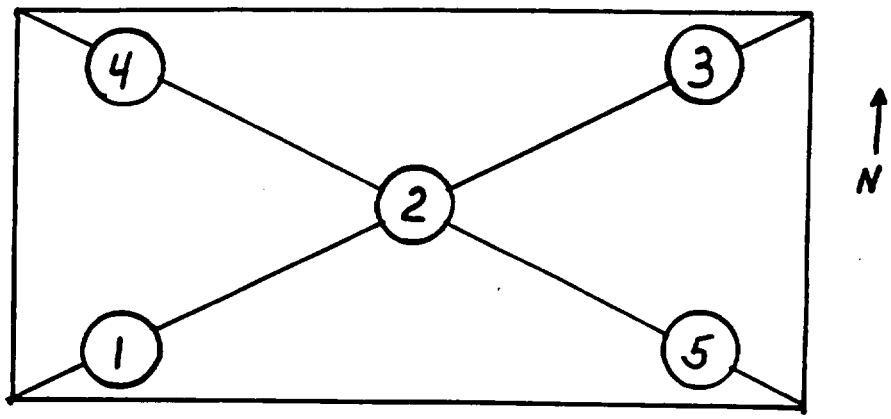
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 08	Time: 1900	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 70 N Confirmation Survey

Bicron analyst # B4664
" G-5 # B5986

Cal Due 2/9/00

SKETCH:



Bkgd	15,297	cpm
walkover	12-18,000	cpm
#1	13,793	cpm
#2	14,667	cpm
#3	15,095	cpm
#4	14,486	cpm
#5	14,645	cpm

REMARKS: Sample taken 10/11/99 0940
Sample ID # 991011601
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: N Zenenberger Date: 10/12/99

Millennium MRP Remediation Project
Radiological Surveillance Summary Report
for
Work Week of 10/11/99 – 10/15/99

Grid Surveys				
Grid ID	Survey Date	Scan Survey[1] Result (Fidler)	Sample Results[2] (pCi/g, Ra-226&Ra-228)	Comments
85 S.W.	10/11/99	<2 X Bkg	3.6	
86 South	10/11/99	<2 X Bkg	<4.4	
87 South	10/11/99	<2 X Bkg	<2.9	
87 North	10/11/99	<2 X Bkg	4.9	
86 North	10/11/99	<2 X Bkg	2.9	
82 N.W.	10/12/99	<2 X Bkg	2.2	
95 S.W.	10/12/99	<2 X Bkg	3.8	
85 N.E.	10/12/99	<2 X Bkg	4.5	
94 S.E.	10/12/99	<2 X Bkg	3.8	
84 North	10/12/99	<2 X Bkg	4.9	
94 N.W.	10/12/99	<2 X Bkg	5.5	
93 East	10/12/99	<2 X Bkg	5.0	
93 West	10/12/99	<2 X Bkg	5.7	
92 East	10/13/99	<2 X Bkg	3.4	
92 West	10/13/99	<2 X Bkg	2.3	
98 West	10/15/99	<2 X Bkg	2.9	
99 West	10/15/99	<2 X Bkg	2.3	
98 East	10/15/99	<2 X Bkg	3.6	
97 West	10/15/99	<2 X Bkg	2.3	
99 East	10/15/99	<2 X Bkg	2.1	
99 a. South	10/15/99	<2 X Bkg	3.1	Grid 99 a. is the designation given for grid East of Grid 99.
97 East	10/15/99	<2 X Bkg	1.9	
91 South	10/15/99	<2 X Bkg	3.2	
90 North	10/15/99	<2 X Bkg	2.6	
91 North	10/15/99	<2 X Bkg	2.7	
90 South	10/15/99	<2 X Bkg	3.1	
89 East (East ½)	10/15/99	<2 X Bkg	5.4	
88 East (East ½)	10/15/99	<2 X Bkg	2.8	
74 East (East ½)	10/15/99	<2 X Bkg	3.3	
South End of Cement Pad, Location of Telephone Poles	10/11/99	<2 X Bkg	N.A.	Elevated readings, measured during work week beginning 9/13/99 have been remediated.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1130	Page 1 of 1
RWP No. 99004	WORK ORDER No.	BLDG. No.	

SPECIFIC ITEMS OF SURVEY: Location of 2 Telephone Poles at South End of Cement Pad

PURPOSE OF SURVEY: Confirmation Survey Post Remediation

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
A228Z	5/14/00	NA /	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☑ G-5 ☐ B588M (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks Scan results for remediated area (cpm)
	Location of East Pole					12,000 – 20,000 cpm
	Location of West Pole					12,000 – 20,000 cpm

REMARKS: Fidler BKg = 13,100
All readings < 2 x BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R. Lenenberger R Lenenberger

Reviewed by: R Lenenberger Date 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1350	Page 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

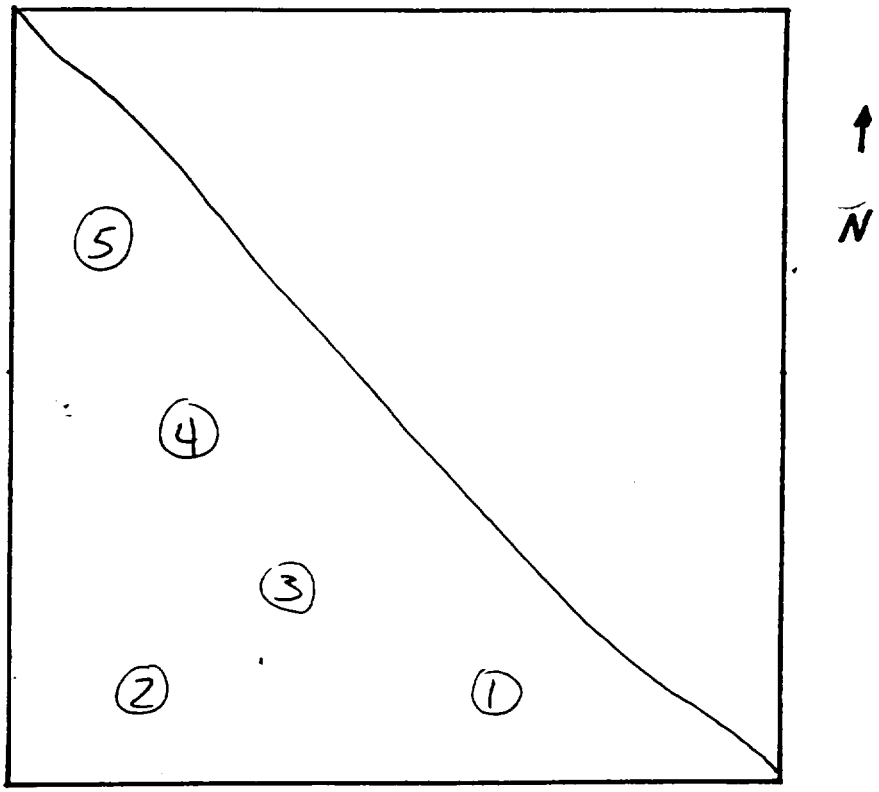
LOCATION: Grid 85 SW Confirmation Survey

Bicron analyst # B466-J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	16555 cpm
walkover	14-18,000 cpm
# 1	14,410 cpm
# 2	14,422 cpm
# 3	14,567 cpm
# 4	15,194 cpm
# 5	14,091 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 991011604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zenenberger

Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

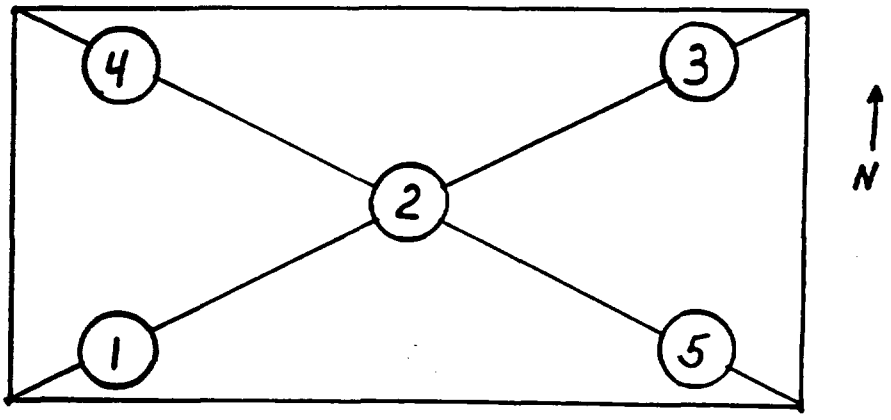
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1448	Page 1 of 1
RWP No. 8L South	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 16 250 cpm
walkover 13000 - 20 000 cpm
#1 13 445 cpm
#2 14 407 cpm
#3 16 185 cpm
#4 16068 cpm
#5 15 254 cpm

REMARKS: #991011C02 (Sample ID)
All readings < 2 times BKg

RVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Hamberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

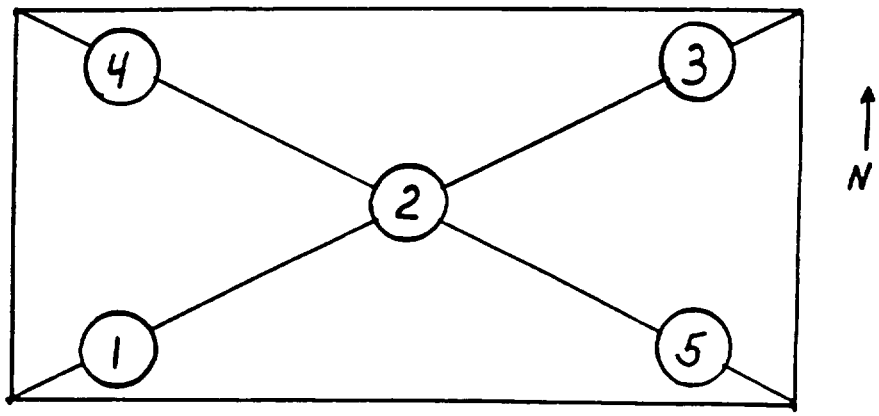
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1600	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 87 South Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



BKgd 16900 cpm
walkover 15000-19000 cpm
#1 16684 cpm
#2 15716 cpm
#3 16065 cpm
#4 15697 cpm
#5 15229 cpm

REMARKS: # 991011603 (Sample ID)
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 10014

Reviewed by: R. Jennings Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

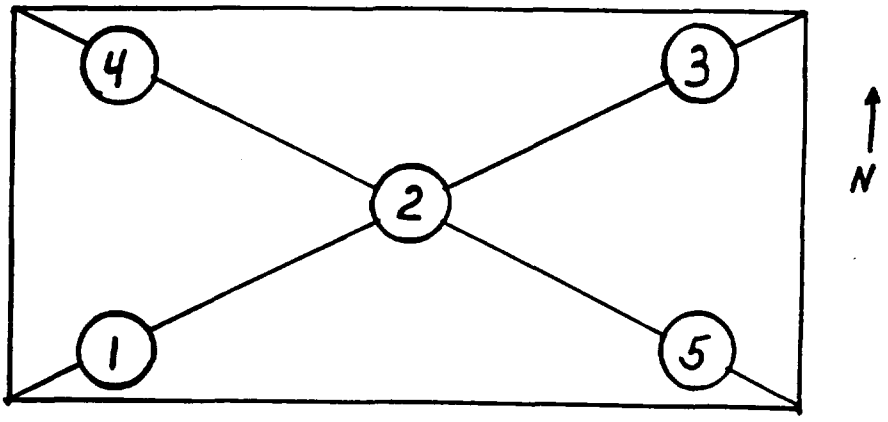
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1630	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 8~~6~~7N Confirmation Survey

Bicron analyst # DRS 10/11/99 B46dd
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	16,351	cpm
walkover	14-20,000	cpm
#1	14,921	cpm
#2	14,466	cpm
#3	15,707	cpm
#4	15,971	cpm
#5	15,361	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 991011606

.VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Muenbeyer Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

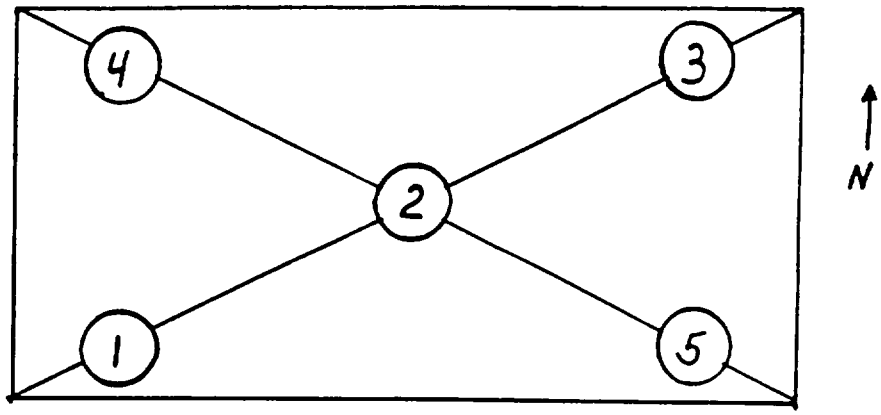
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 11	Time: 1645	Page 1 of —
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 86 North Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal Due 5-14-00

SKETCH:



Bkgd	18684	cpm
walkover	17000 - 22000	cpm
#1	16595	cpm
#2	16810	cpm
#3	19714	cpm
#4	17609	cpm
#5	16495	cpm

REMARKS: # 991011605 (Sample ID)
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 10019

Reviewed by: R Zenenberger Date: 10/12/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

Site: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1305	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

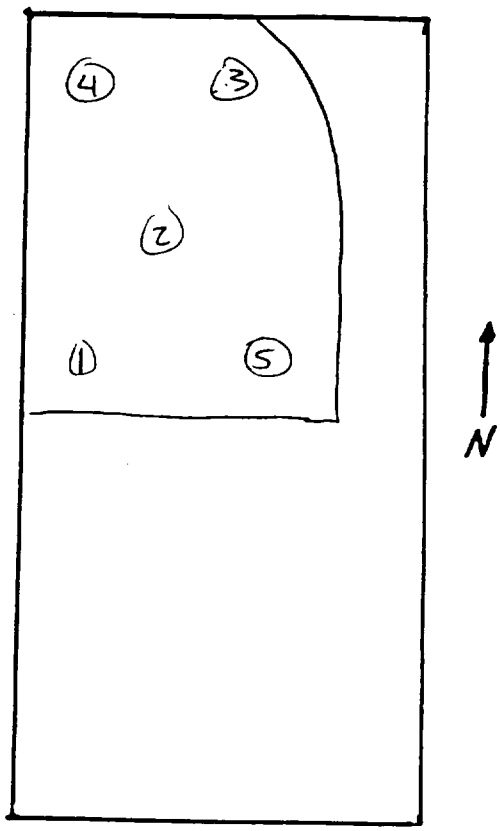
LOCATION: Grid 82 NW corner Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd 12511 cpm
walkover 10-14,000 cpm
1 10,567 cpm
2 11,165 cpm
3 11,719 cpm
4 11,209 cpm
5 11,189 cpm



REMARKS: Verified to flood plain limit of dig.
Sample ID # 991012 B1
All readings < 2 times BKG

JOBSITE TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeuenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1345	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

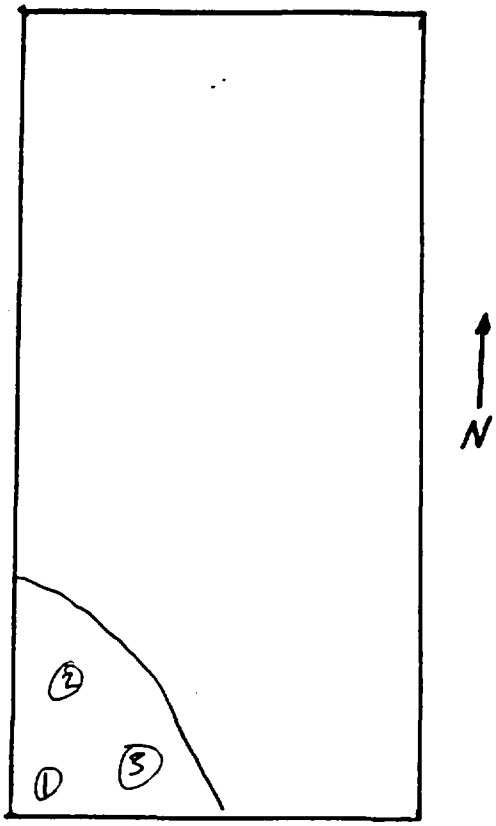
LOCATION: Grid 95 SW corner Confirmation Survey

Bicron analyst # B466 J
" G-5 # B598 G

Cal. Due 2/9/00

SKETCH:

Bkgd	15,716 cpm
walkover	12-16,000 cpm
# 1	14619 cpm
# 2	15,168 cpm
# 3	13,126 cpm
# 4	N/A cpm
# 5	N/A cpm



REMARKS: Verified to floodplain limit of dig.
Sample ID # 991012603
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: L Jenenberger

Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1345	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

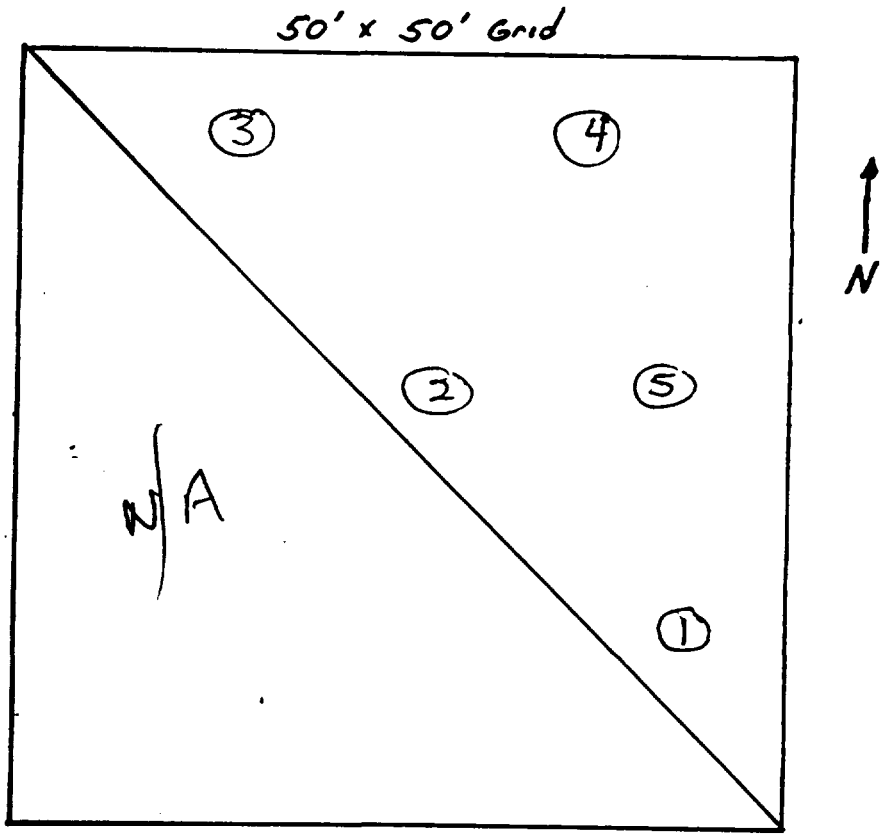
LOCATION: GRID 85 NE Confirmation Survey

Bicron analyst #A228Z
" G-5 #B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	17050 cpm
walkover	15K TO 18K cpm
# 1	15662 cpm
# 2	16085 cpm
# 3	15115 cpm
# 4	15896 cpm
# 5	15264 cpm



REMARKS: All readings < 2 times BKg

Sample ID # 991012.602

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: R Henenberger

Date:

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1410	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

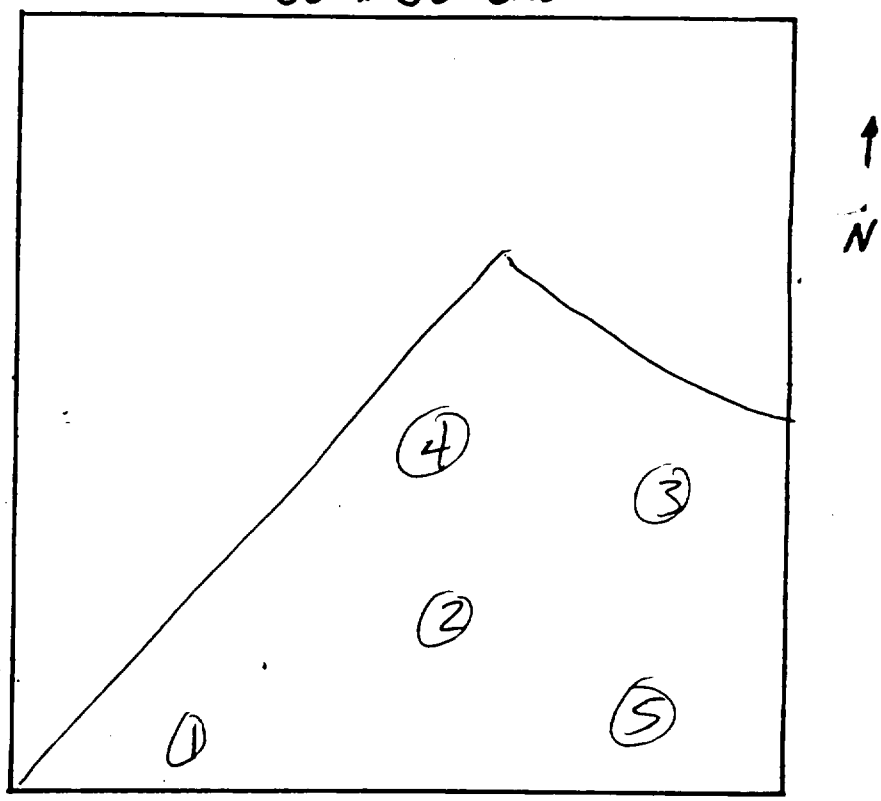
LOCATION: Grid 94 SE Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	15,274 cpm
walkover	12-18,000 cpm
# 1	13,561 cpm
# 2	13,421 cpm
# 3	14,203 cpm
# 4	14,161 cpm
# 5	12,416 cpm



REMARKS: Verified to floodplain limit of dig.
Sample ID 991012605
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Hanenberger

Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1425	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 84 N Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 16180 cpm

walkover 16K TO 20 K cpm

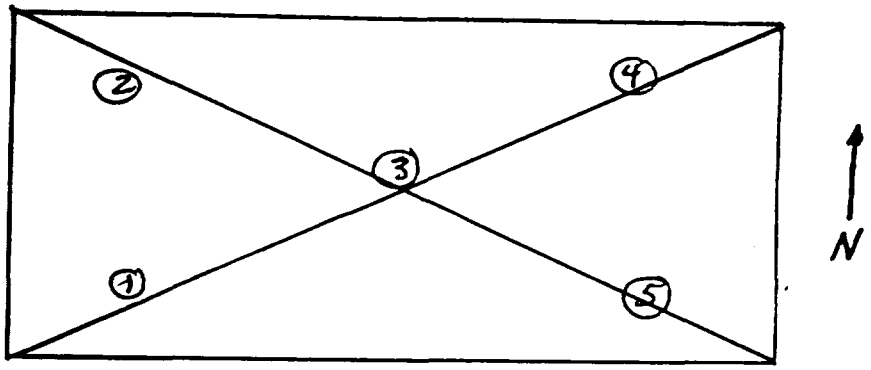
1 15881 cpm

2 18976 cpm

3 14785 cpm

4 14533 cpm

5 15091 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 991012604

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J.F. LEWIS / J F Lewis /

Reviewed by: Date:

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

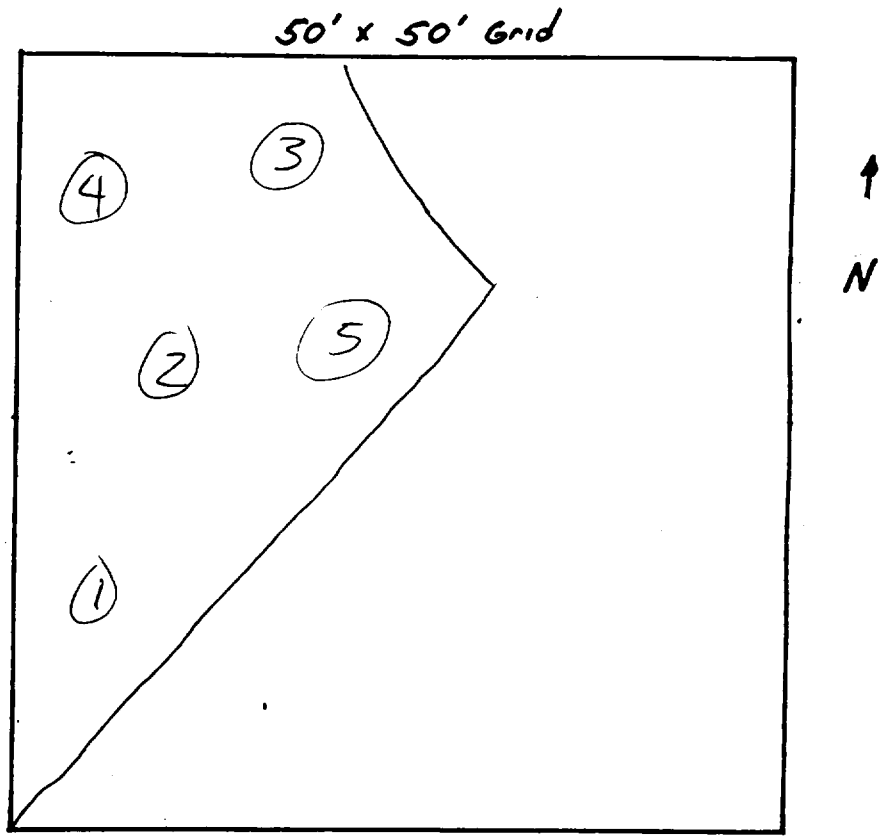
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1500	Page 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 94 NW Confirmation Survey

Bicron analyst # B4661
" G-5 # B598G
Cal. Due 2/9/00

SKETCH:

Bkgd	14,077 cpm
walkover	12-16,000 cpm
# 1	13,226 cpm
# 2	13,421 cpm
# 3	13,547 cpm
# 4	13,399 cpm
# 5	13,767 cpm



REMARKS: Verified to floodplain limit of dig.
Sample ID # 991012606
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: _____ / _____ / _____

Reviewed by: R Tenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1550	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

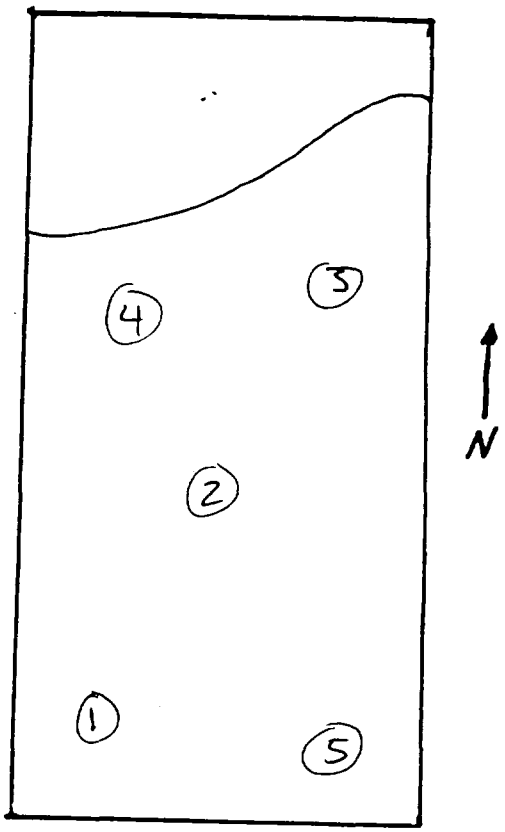
LOCATION: Grid 93 East Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	14,903 cpm
walkover	12-18,000 cpm
# 1	13,862 cpm
# 2	14,943 cpm
# 3	13,234 cpm
# 4	14,353 cpm
# 5	14,756 cpm



REMARKS: Verified to floodplain limits of dig.
Sample ID # 991012607
All readings < 2 times Bkg

'EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: K Weinberger

Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 12	Time: 1630	Page 1 of —
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

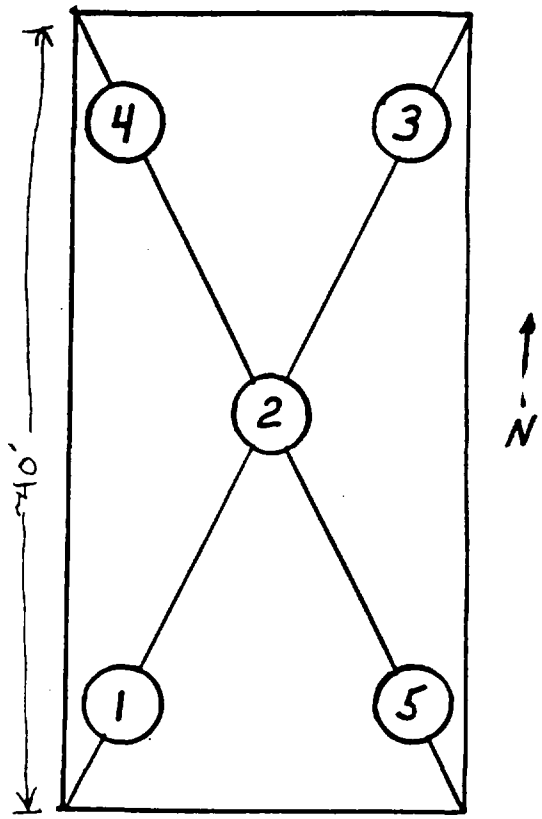
LOCATION: Grid 93 West Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	16,645 cpm
walkover	12-18,000 cpm
# 1	14,266 cpm
# 2	13,558 cpm
# 3	16,502 cpm
# 4	15,086 cpm
# 5	14,432 cpm



REMARKS: Verified to floodplain limits of dig.
Sample ID # 991012608
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D Jenkins / D. Jenkins /

Reviewed by: R Tenenberger

Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 13	Time: 0845	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 92 East Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd 16,978 cpm

walkover 1218,000 cpm

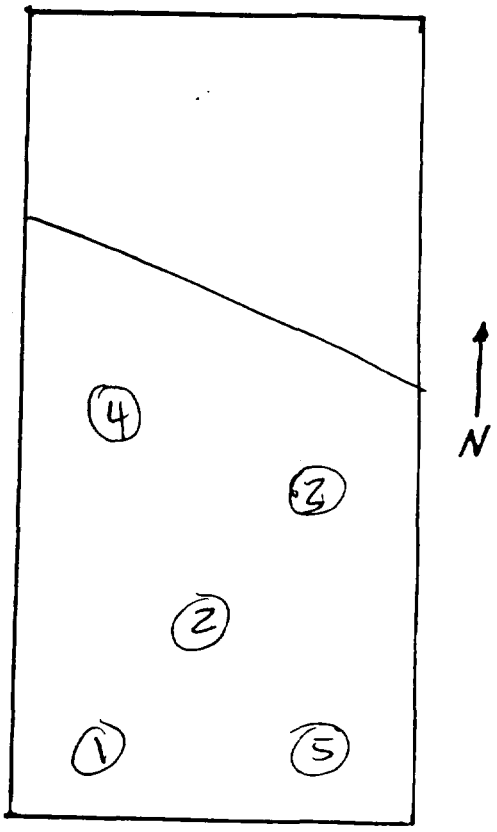
1 13081 cpm

2 13,165 cpm

3 16,816 cpm

4 16,756 cpm

5 12,220 cpm



REMARKS: Verified to floodplain limits of dig.
Sample ID # 99101360 1
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 13	Time: 0915	Page 1 of
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

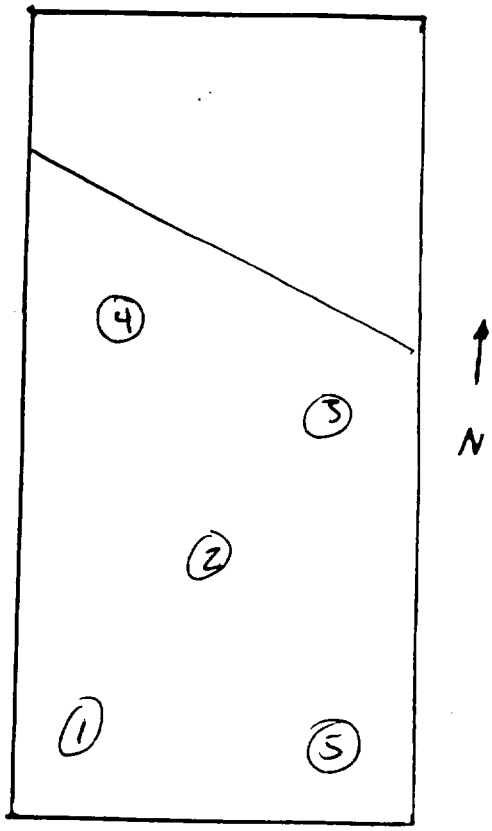
LOCATION: Grid 92 West Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	17,667 cpm
walkover	12-18,000 * cpm
# 1	13,424 cpm
# 2	18539 cpm
# 3	16,100 cpm
# 4	16,473 cpm
# 5	12,427 cpm



Sample ID # 991013602

REMARKS: * At northern boundary of floodplain limits of dig readings were up to 24,000 cpm at midpoint height of wall.
All readings < 2 times Bkg

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zeuenbergen Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 0725	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

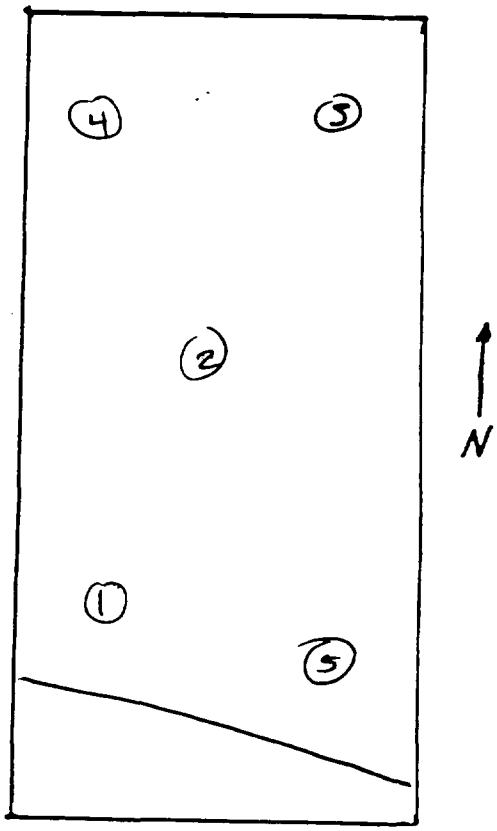
LOCATION: Grid 98W Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	13,664 cpm
walkover	12-18,000 cpm
# 1	17,378 cpm
# 2	12,897 cpm
# 3	12,747 cpm
4	14,496 cpm
# 5	15,411 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 991015601

TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Huenberger

Date: 10/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

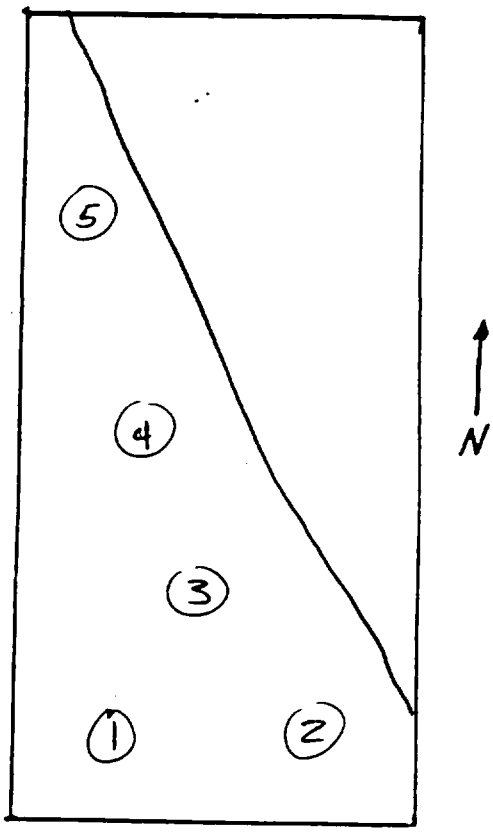
RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 0800	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	
LOCATION: Grid 99 W	Confirmation Survey		

Bicron analyst # B466J
" G-5 # B598G
Cal. Due 2/9/00

SKETCH:

Bkgd 14,067 cpm
walkover 12-~~18~~ 16,000 cpm
DRJ 10/15/99
1 11,300 cpm
2 13,874 cpm
3 11,861 cpm
4 11,513 cpm
5 12,252 cpm



REMARKS: Verified to floodplain limits of dig.
Sample ID # 991015612
All readings < 2 times BKg

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

/ / / /

eviewed by: R Zemberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

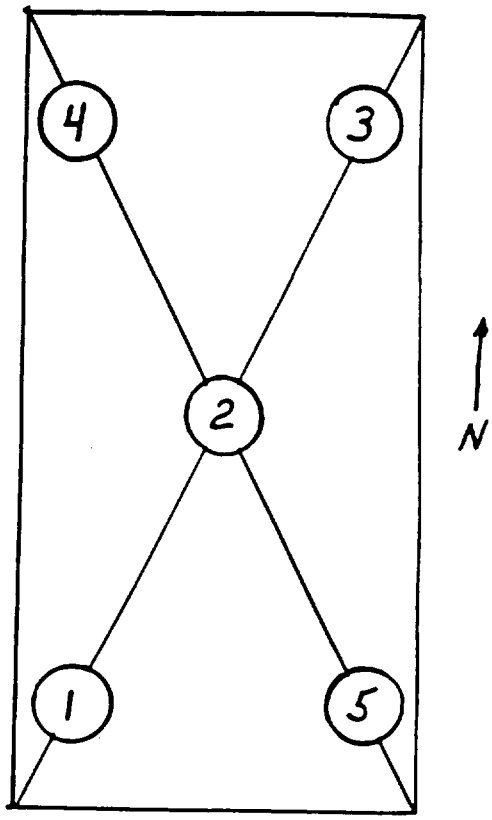
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 0830	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 98E Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G
Cal. Due 2/9/00

SKETCH:

Bkgd	16,227	cpm
walkover	12-18,000	cpm
# 1	15,122	cpm
# 2	11,825	cpm
# 3	15,121	cpm
# 4	13,909	cpm
# 5	16,992	cpm



REMARKS: All readings < 2 times BKG
Sample ID #: 991015603, 991015604 (Dup)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: Date:

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 0905	Page 1 of 5
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

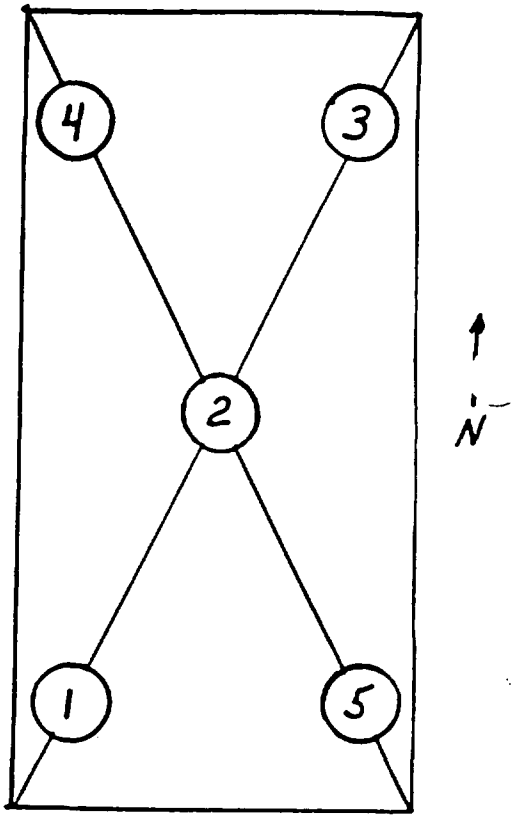
LOCATION: Grid 97W Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	15,157 cpm
walkover	12-16,000 cpm
# 1	11,519 cpm
# 2	13,098 cpm
# 3	16,420 cpm
# 4	13,058 cpm
# 5	12,457 cpm



REMARKS: Verified to flood plain limits of dig.
Sample ID # 99101 5605
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zevenbergen

Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 0935	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

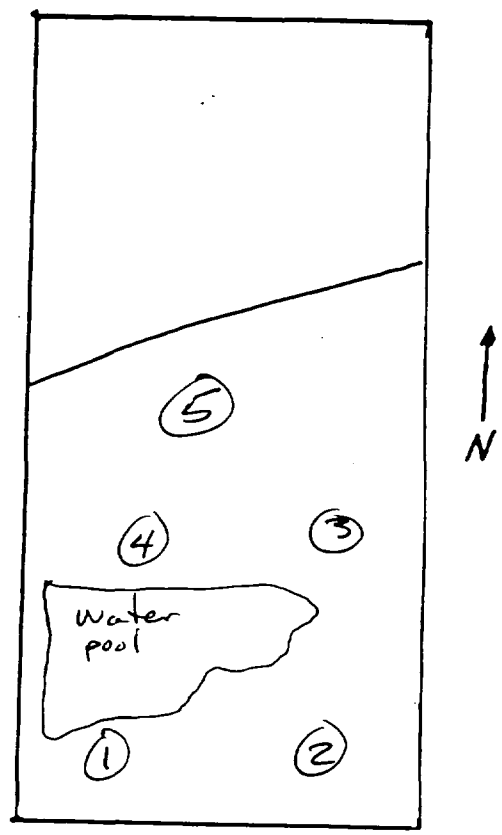
LOCATION: Grid 99E Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	17,758 cpm
walkover	14-24,000 cpm
# 1	14,923 cpm
# 2	14,227 cpm
# 3	15,308 cpm
"	13014 cpm
# 5	15401 cpm



REMARKS: Verified to floodplain limits of dig.
Wall at North reads ~
All readings < 2 times Bkg
Sample ID # 991015606

TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: R Zwerchey Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1005	Page 1 of —
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 99 a South Confirmation Survey

Bicron analyst # B466-J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd 18,388 cpm

walkover 16-22,000 cpm

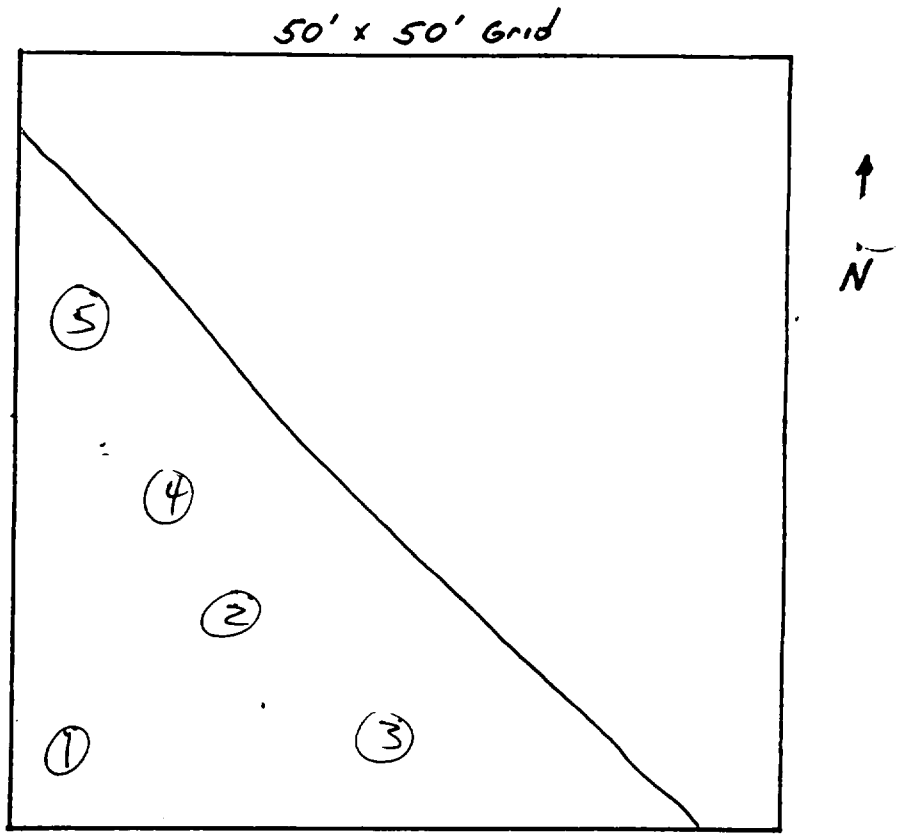
1 15,038 cpm

2 15,334 cpm

3 19,703 cpm

4 15,933 cpm

5 13,770 cpm



REMARKS: Floodplain area
Sample ID # 9910/5607
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Tenenbaum Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1040	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

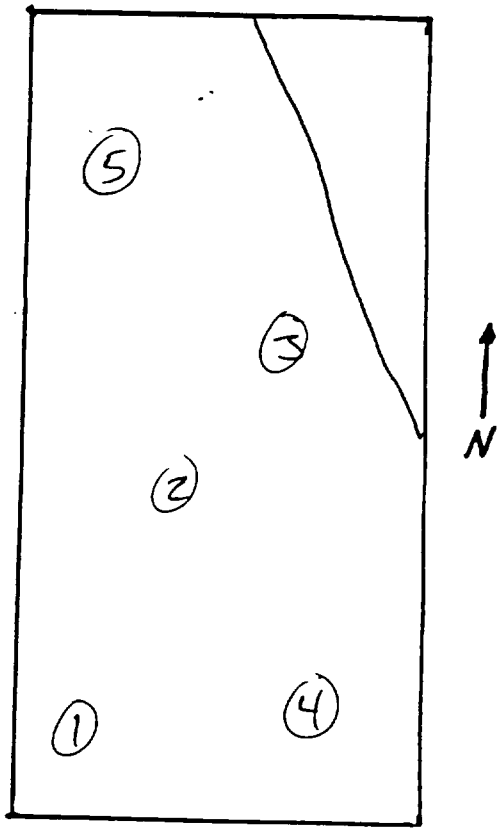
LOCATION: Grid 97E Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	17,792 cpm
walkover	14-22,000 cpm
# 1	12,592 cpm
# 2	14,091 cpm
# 3	19,022 cpm
4	15,458 cpm
# 5	14,158 cpm



REMARKS: Verified to floodplain limits of dig.
Sample ID # 991015608
All readings < 2 times BKG

EY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zinenberg Date: 10/18/99

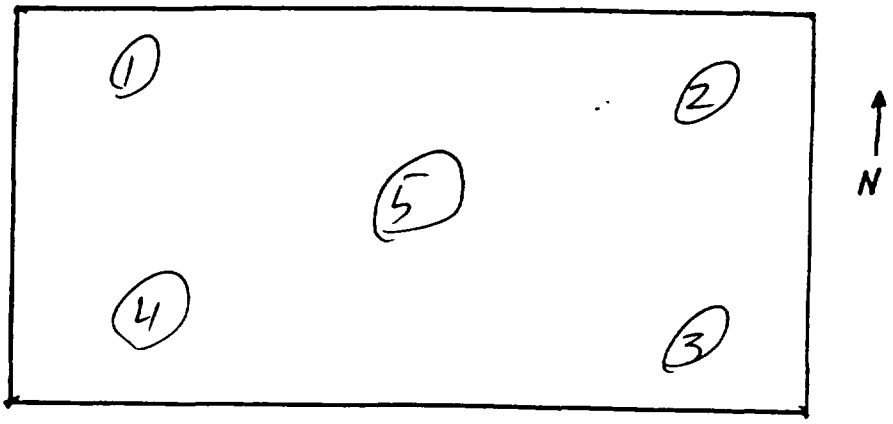
MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: ~~1415~~ 1615 RL 10/18/99	Page ___ of ___
RWP No. 99-004	WORK ORDER No. NA	BLDG. No. NA	
LOCATION: 91 South	Confirmation Survey		

Bicron analyst # B466J
" G-5 # B598G
Cal Due 1-15-00

SKETCH:



Bkgd	14793	cpm
walkover	14,000-16000	cpm
#1	14277	cpm
#2	13342	cpm
#3	14,528	cpm
#4	13798	cpm
#5	13697	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 991015610

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R. Leuenberger / R Leuenberger / 98624

Reviewed by: R Leuenberger Date: 10/18/99

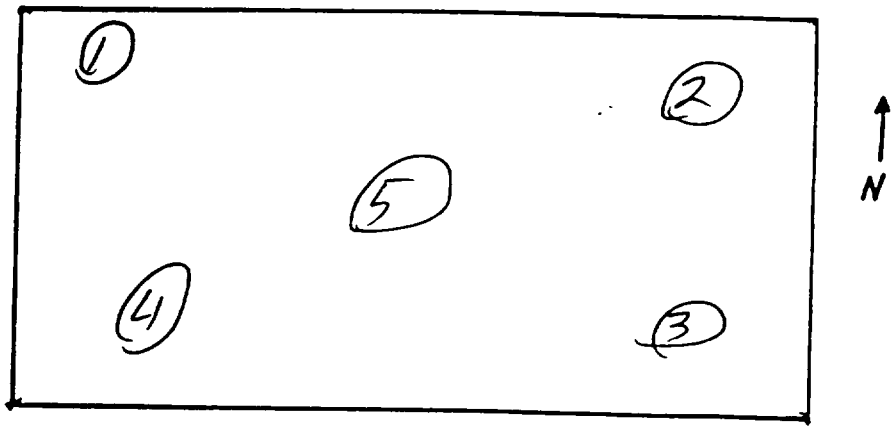
MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1645 Page ___ of ___
RWP No. 99-004	WORK ORDER No. NA	BLDG. No. NA
LOCATION: 90 North Confirmation Survey		

Bicron analyst # B466J
" G-5 # B598G
Cal Due 1-15-00

SKETCH:



Bkgd	14299	cpm
walkover	14,000 - 16,000	cpm
#1	11792	cpm
#2	13823	cpm
#3	13426	cpm
#4	12369	cpm
#5	11599	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 991015612

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Lenenberger / R Lenenberger / 98624

Reviewed by: R Lenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

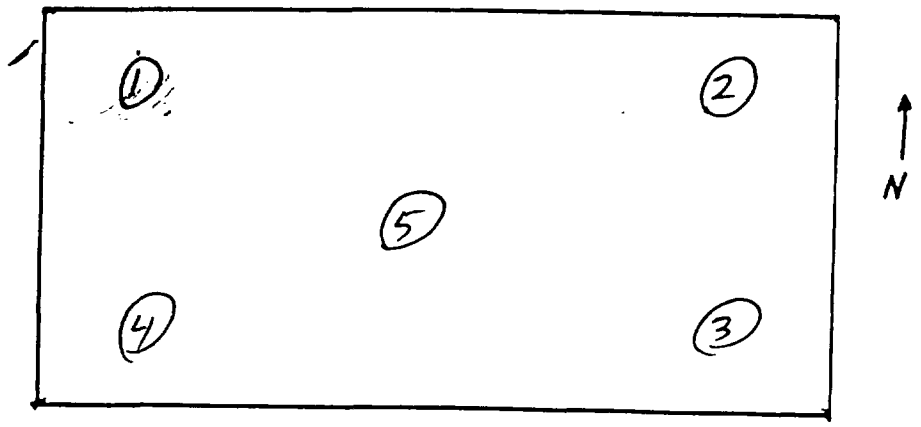
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1655	Page ___ of ___
RWP No. 99-004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: 91 North Confirmation Survey

Bicron analyst # ~~A2282~~ B466J
" G-5 # ~~B588M~~ B598G
R2 10/15/99

Cal Due 1-15-00

SKETCH:



Bkgd	15825	cpm
walkover	14000 - 24000	cpm
#1	13381	cpm
#2	15344	cpm
#3	13869	cpm
#4	13046	cpm
#5	13918	cpm

REMARKS: 18,000 - 24000 Along unexcavated berm of flood plain. Scanned measurements extend to the Fields Brook Flood Plain. Sample ID # 991015611
No Hot Spots Detected, All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Leuenberger / R Leuenberger / 98624

Reviewed by: R Leuenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

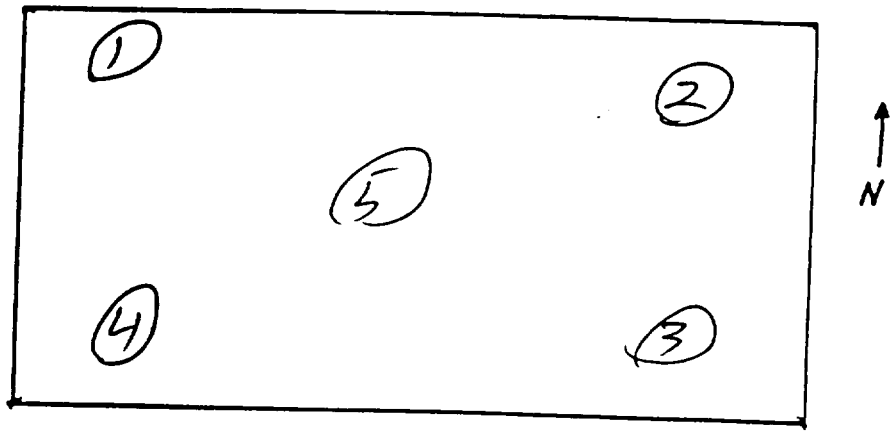
RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1705	Page 1 of 1
RWP No. 99-004	WORK ORDER No. NA	BLDG. No. NA	

LOCATION: 90 South Confirmation Survey

Bicron analyst # B466J
" G-5 # B 598G
Cal Due 1-15-00

SKETCH:



Bkgd	15425	cpm
walkover	15,000-16000	cpm
#1	12439	cpm
#2	13101	cpm
#3	13699	cpm
#4	12570	cpm
#5	12917	cpm

REMARKS: All readings < 2 times Bkg
Sample ID # 991015613

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: R Lenenberger / R Lenenberger / 98624

Reviewed by: R Lenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1630	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 89 East (East ½) Confirmation Survey

Bicron analyst # A 2282
" G-5 # B588M

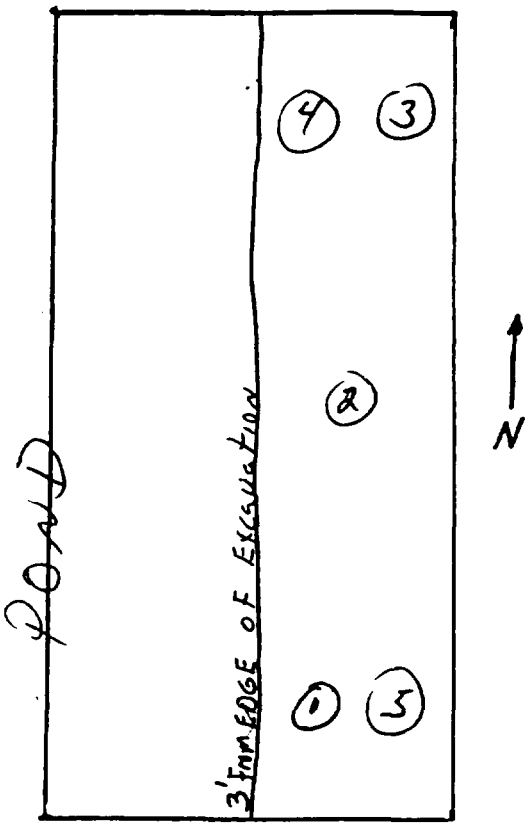
Cal. Due 5-14-00

SKETCH:

Bkgd 16 482 cpm
walkover 15000 - 20000 cpm
1 15 936 cpm
2 16 141 cpm
3 17 866 cpm
4 17 221 cpm
5 14 797 cpm

~~Edge of Excavation~~ ~~cpm~~

10/19/99 TKB



REMARKS: 991015C14 (Sample ID #)
Sample ID # 991015614
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zenenberger Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1800	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

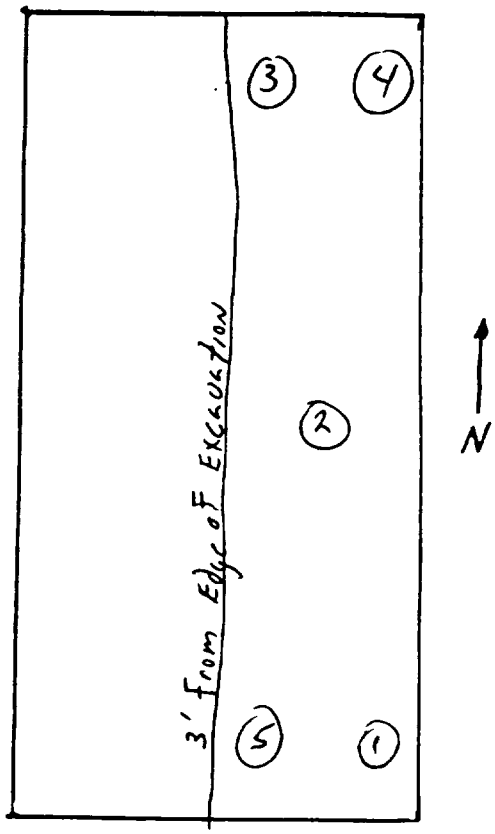
LOCATION: 88 East (East ½) Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 15 784 cpm
walkover 10 000 - 18 000 cpm
1 16953 cpm
2 10 577 cpm
3 14 913 cpm
4 15367 cpm
5 9455 cpm



REMARKS: 991015C15 (Sample ID #)
All readings < 2 times BKG

SURVEYOR TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zeuenberg Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 15	Time: 1845	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

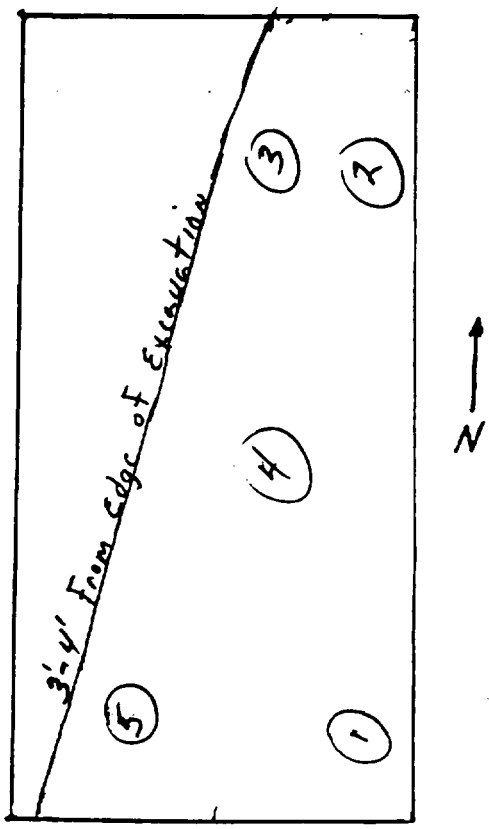
LOCATION: 74 East (East ½) Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	10 473 cpm
walkover	9000 - 13000 cpm
# 1	10 314 cpm
# 2	9 470 cpm
# 3	11 100 cpm
# 4	10045 cpm
# 5	9075 cpm



REMARKS: 991015616 (Sample ID #)

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Tenenberg

Date: 10/18/99

Millennium MRP Remediation Project
Radiological Surveillance Summary Report
for
Work Week of 10/18/99 – 10/22/99

Grid Surveys				
Grid ID	**Survey Date**	**Scan Survey[1] Result (Fidler)**	**Sample Results[2]** (pCi/g; Ra-226&Ra-228)	**Comments**
99 a. North	10/18/99	<2 X Bkg	2.3	Grid 99 a. ID designation given for grid East of Grid 99.
Grids 105,106, 109,111, 113, 115	10/18/99	<2 X Bkg	N.A.	Area surveyed between work plan limit of excavation and Fields Brook 100 year flood plain.
39	10/20/99	<2 X Bkg	11.4	Elevated readings, measured during work week beginning 9/20/99 have been remediated.
41 East	10/20/99	<2 X Bkg	4.4	Elevated readings, measured during work week beginning 9/20/99 have been remediated.
101/103	10/21/99	<2 X Bkg	3.8	Post remidiation for area between work plan limit of excavation and Fields Brook 100 year flood plain.
96	10/22/99	<2 X Bkg	3.7	Post remidiation for area between work plan limit of excavation and Fields Brook 100 year flood plain.
83 North	10/22/99	<2 X Bkg	2.5	
74	10/22/99	<2 X Bkg	5.3	Surveyed to work plan excavation limit.
88	10/22/99	<2 X Bkg	5.5	Surveyed to work plan excavation limit.
89	10/22/99	<2 X Bkg	3.7	Surveyed to work plan excavation limit.
73 N. E.	10/23/99	<2 X Bkg	3.1	Survey does not include hot spot measured under Cement Pad.
102 NE/103 SE	10/22/99	<2 X Bkg	3.7	Survey performed after excavating contaminated seam from previously remediated area.
Location of South Silt Fence	10/19/99	<2 X Bkg	N.A.	Area surveyed after silt fence is removed.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)
3) Based on measurement limit of detection.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 18	Time: 1115	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: Grids 105, 106 areas

PURPOSE OF SURVEY: Confirmation survey

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
B466J/B5986	2/9/00	– / –	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☒ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
	Grid 105 south of floodplain					10-14,000 cpm
	Grid 106 south of floodplain					10-14,000 cpm

REMARKS: Areas walked over is between original excavation limits and floodplain markers. Some of the area has been filled or covered by the new road. Background of G5 was 12,411 cpm.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Zaenberger

Date: 10/19/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 18	Time: 1115	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: Grids 109, 111, 113, 115 areas.

PURPOSE OF SURVEY: Confirmation survey

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
B466J/B558G	2/9/00	— / —	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☑ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	dpm per 100 cm² βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks
	Grid 115 south of floodplain					10-12,000 cpm
	Grid 113 "					10-12,000 cpm
	Grid 111 "					10-14,000 cpm
	Grid 109 "					10-14,000 cpm

REMARKS: Areas walked over is between original excavation limits and flood plain markers. Some of the area has been filled or covered by the new road. Background of G5 was 12,411 cpm

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: [signature] Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 18	Time: 1710	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 99a North Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 20506 cpm

walkover 17000 - 25000 cpm

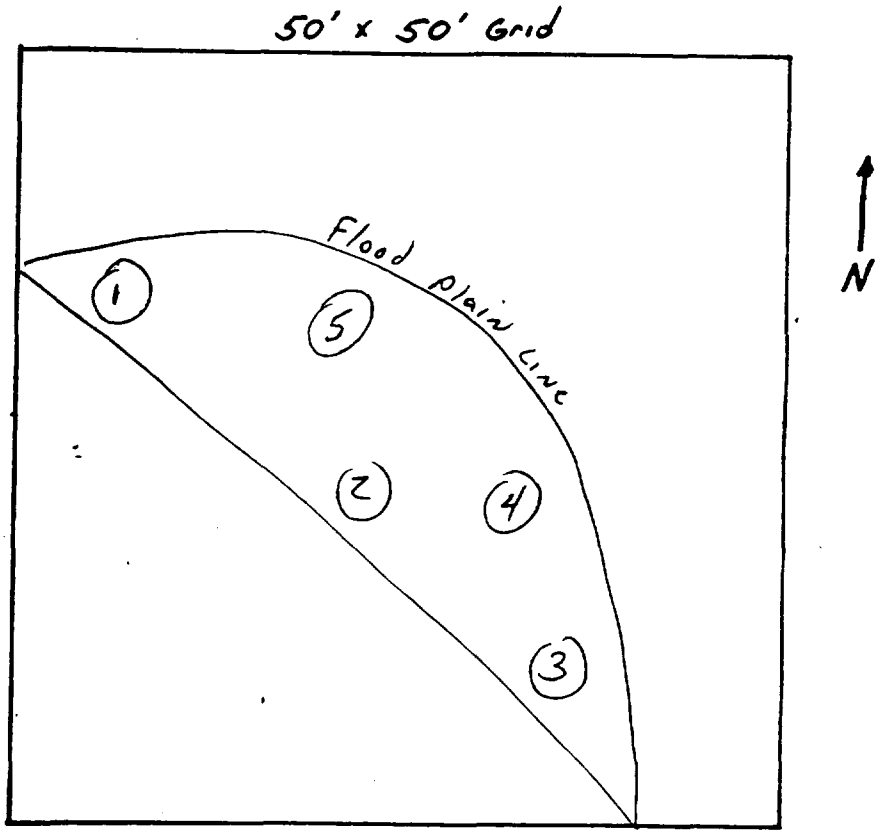
1 18640 cpm

2 17225 cpm

3 17976 cpm

4 18915 cpm

5 17191 cpm



REMARKS: Sampled area was South of Flood plain
Sample ID# 99101860
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zeuenberg Date: 10/18/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 19	Time: See Remarks	Page 1 of 1
RWP.No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

SPECIFIC ITEMS OF SURVEY: South Silt Fence

PURPOSE OF SURVEY: Confermation

INSTRUMENT DATA

Meter Serial Number	Cal Due Date	Efficiency / CF	Detector Models
Bicron Analyst A2282	5/14/00	N/A / N/A	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☑ G-5 (B588M) ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)
	/ /	/	☐ 44-9 ☐ 43-5 ☐ 43-10-1 ☐ IPC 9025 ☐ G-5 ☐ _____ (Other)

RADIATION AND CONTAMINATION SURVEY RESULTS

CPM 10/19/99

Survey Map Attached: ☐ Yes ☐ No

Sample Number	Description / Location	dpm per 100 cm² βγ Removable	~~dpm per 100 cm²~~ βγ Total	dpm per 100 cm² α Removable	dpm per 100 cm² α Total	Remarks BKgd	Time
	westend to 1st Elec Pole		8000 - 20000			14914	1258
	1st Pole to 2nd Pole		10000 - 18000			13912	1313
	2nd Pole to 3rd Pole		11000 - 17000			13990	1351
	3rd Pole to 4th Pole		9000 - 17000			13168	1436

REMARKS: All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: K Zemsky Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

MILLENIUM	DATE: Yr 99 Mo 10 Dy 20	Time: 1455	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

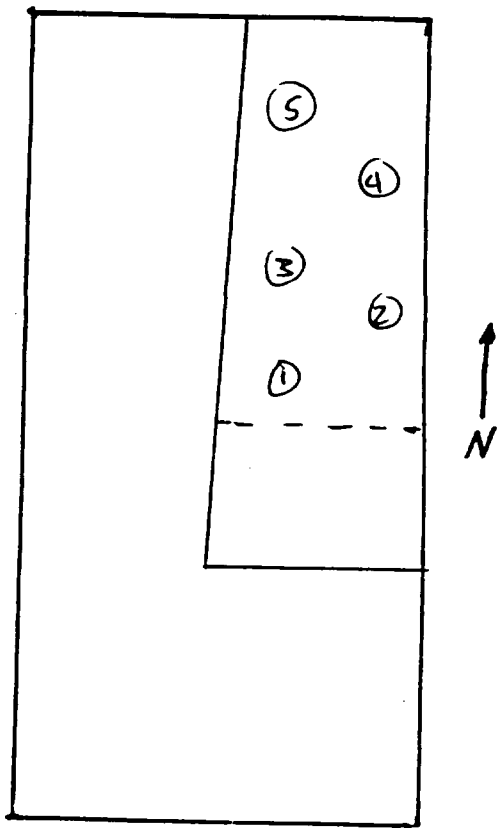
LOCATION: Grid 39 East Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal. Due 2/9/00

SKETCH:

Bkgd	13,563 cpm
walkover	12 - 18,000 cpm
# 1	14,024 cpm
# 2	17057 cpm
# 3	13024 cpm
4	15765 cpm
# 5	12,976 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 991020601

TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R Hunberger

Date: 10/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

TE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 20	Time: #1515	Page 1 of 1
RWP No. 99 004	WORK ORDER No. N/A	BLDG. No. N/A	

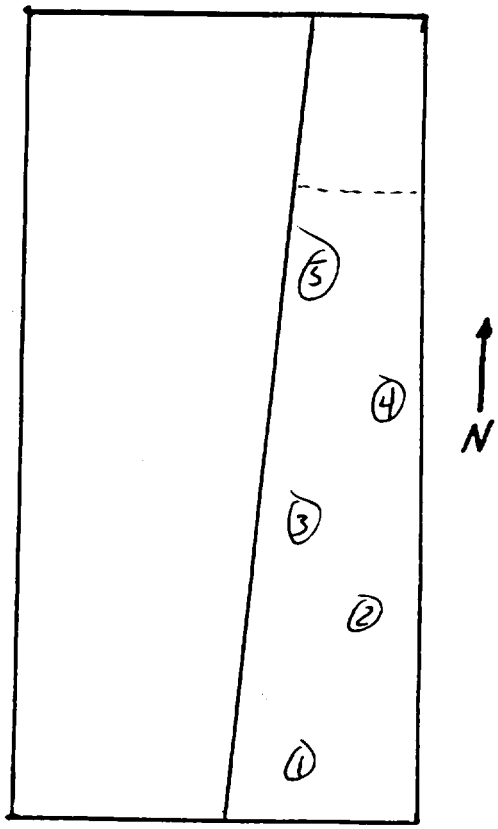
LOCATION: Grid 41 East Confirmation Survey

Bicron analyst # B466J
" G-5 # D58G

Cal. Due 2/9/00

SKETCH:

Bkgd	12,849 cpm
walkover	10 - 16,000 cpm
# 1	12,060 cpm
# 2	13,111 cpm
# 3	13,013 cpm
# 4	14,495 cpm
# 5	14,414 cpm



EMARKS: Dashed line indicates end of digging area.
Sample ID # 991020602
All readings < 2 times Bkg

VEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

eviewed by: R Tewnberg Date: 10/27/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 21	Time: 1200	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grids 103/101 Flood Plain to Excavation Limits Confirmation Survey

Bicron analyst # A228Z.
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 16 231 cpm

walkover 11,000 - 21000 cpm

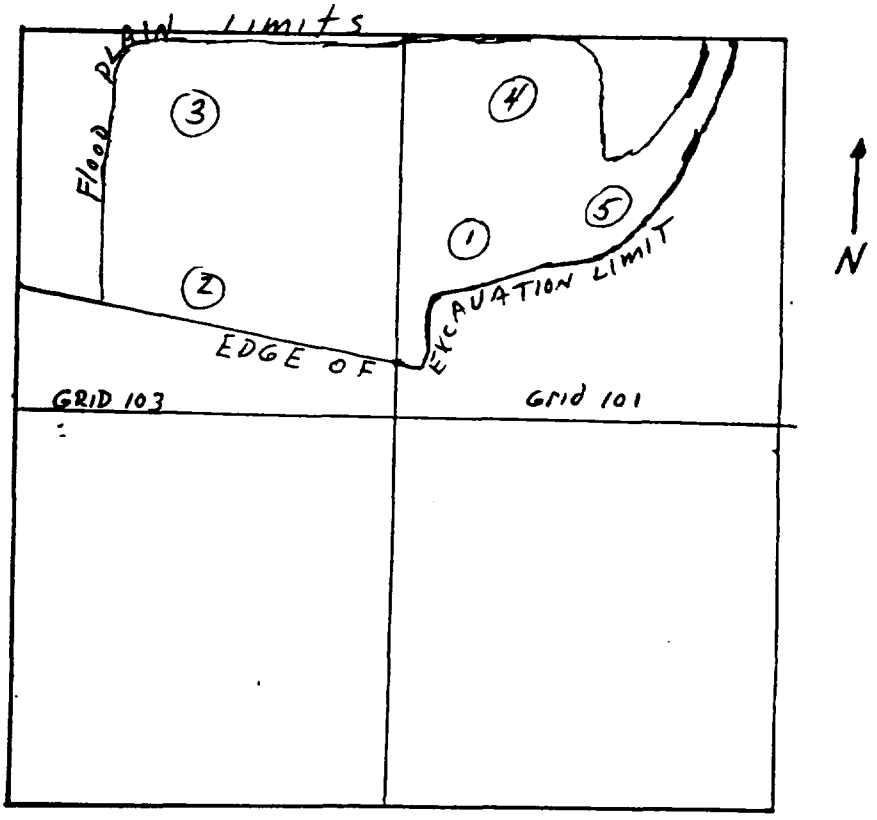
1 14 720 cpm

2 14209 cpm

3 15 806 cpm

4 14 794 cpm

5 12 451 cpm



REMARKS: All readings < 2 times Bkg

Sample ID # 991021601

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zlembergs Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 22	Time: 0950 Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A

LOCATION: 103 South East / 102 North East Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 15005 cpm

walkover 12000 - 20000 cpm

1 15643 cpm

2 13922 cpm

3 13806 cpm

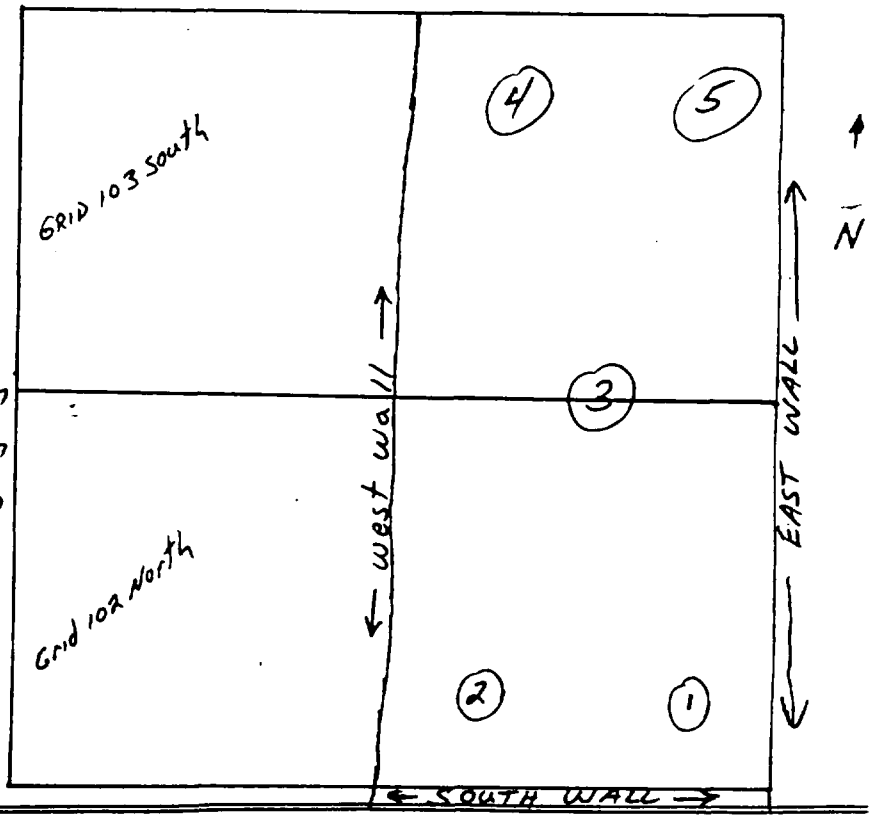
4 13318 cpm

5 12667 cpm

Scan of West wall 14000 - 22000 cpm

" " South wall 11000 - 40000 cpm

" " East wall 7000 - 25000 cpm



REMARKS: # 991022 C01 (Sample ID)
Area was re-excavated after a seam of contaminated soil was detected in Grid 103 North.
All readings < 2 times BKg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Jewerley Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

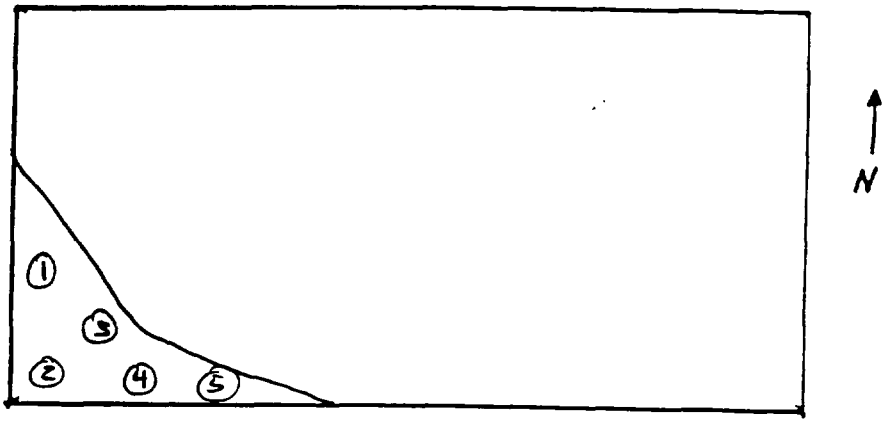
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 22	Time: 1120	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 96 Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



Bkgd	15,243	cpm
walkover	14-18,000	cpm
#1	14,949	cpm
#2	13,604	cpm
#3	13,655	cpm
#4	13,770	cpm
#5	14,442	cpm

REMARKS: Sampled after removal of fill material
Sample ID# 991022602
All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / D. Jenkins /

Reviewed by: R [signature] Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

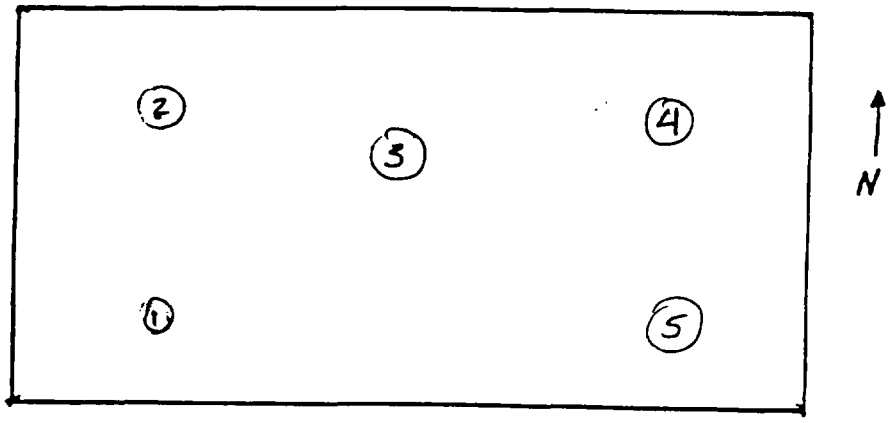
SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 22	Time: 1150	Page 1 of 1
RWP No. 99004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: Grid 83 N Confirmation Survey

Bicron analyst # B466J
" G-5 # B598G

Cal Due 2/9/00

SKETCH:



BKgd	14,019	cpm
walkover	14-18,000	cpm
#1	14,229	cpm
#2	13,331	cpm
#3	13,626	cpm
#4	13,514	cpm
#5	13,488	cpm

REMARKS: Sampled after removal of fill material.
Sample ID # 991022603
All readings < 2 times BKG

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: D. Jenkins / [signature] /

Reviewed by: R [signature] Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 22	Time: 1510	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 74 Excavation to MRP Limits Confirmation Survey

Bicron analyst # A2282
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 12 846 cpm

walkover 9000 - 17000 cpm

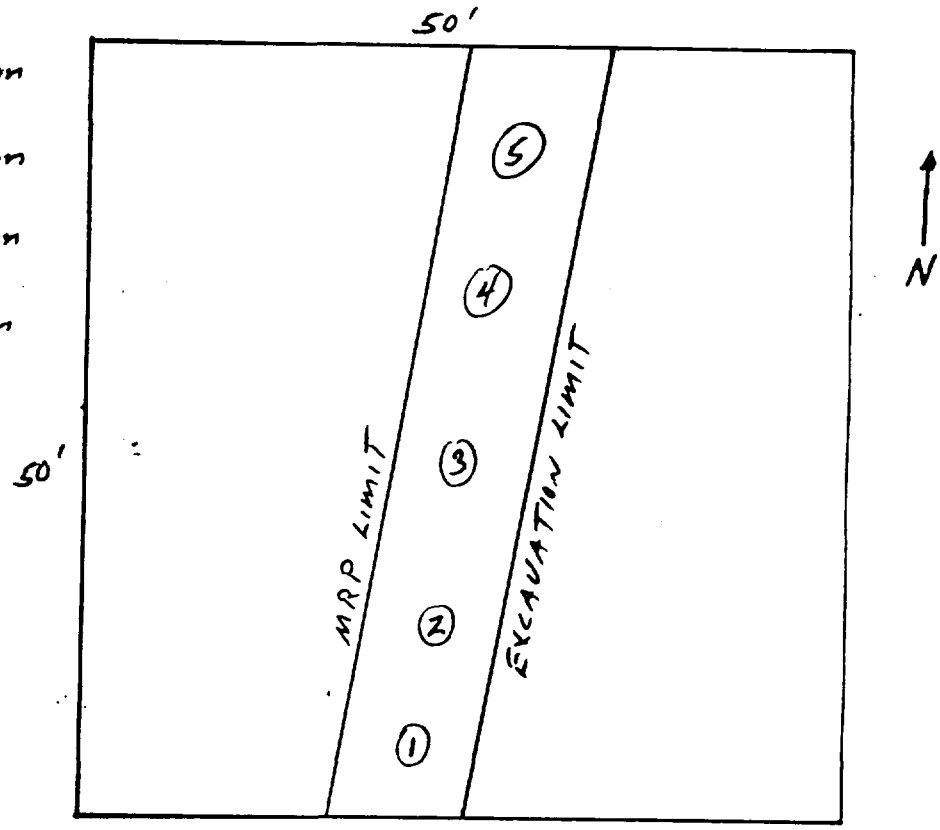
1 9 213 cpm

2 10 279 cpm

3 10 440 cpm

4 9 948 cpm

5 15 593 cpm



REMARKS: # 991022C04 Sample ID

All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zimmerman Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 23	Time: 1540	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

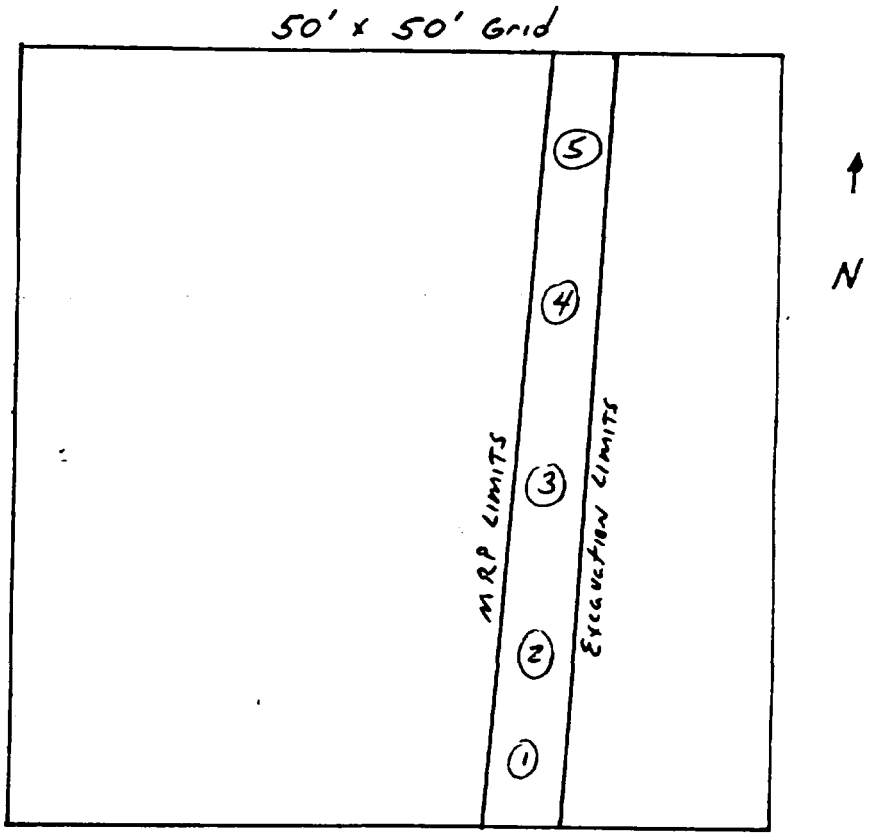
LOCATION: 88E Excavation to MRP Limits Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd	12 149 cpm
walkover	9000 - 17000 cpm
# 1	10 986 cpm
# 2	10 520 cpm
# 3	10 693 cpm
# 4	11 169 cpm
# 5	11098 cpm



Sample ID#
REMARKS: 99 991022605/606 (DUP)

All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: K Tenenberger

Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 23	Time: 1630	Page 1 of 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

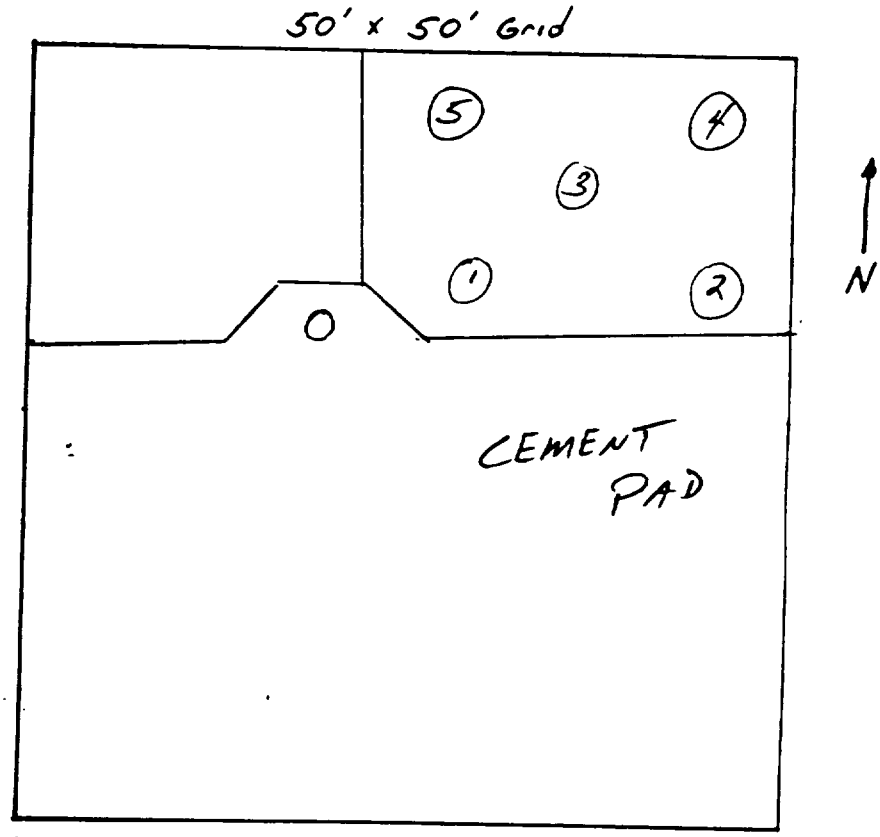
LOCATION: 73 North ~~west~~ East Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 11 622 cpm
walkover 11000 - 14000 cpm
1 11 656 cpm
2 10 893 cpm
3 10 572 cpm
4 11 227 cpm
5 9572 cpm



REMARKS: 991022C07 (Sample ID)
All readings 2 times BKg
Survey does not include location of Hot Spot under cement
See follow-up survey performed 10/28/99 for post remediation of Hot Spot.

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zemenberger Date: 10/25/99

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 23	Time: 1650	Page 1
RWP No. 99-004	WORK ORDER No. N/A	BLDG. No. N/A	

LOCATION: 89E, Excavation to MRP Limits Confirmation Survey

Bicron analyst # A228Z
" G-5 # B588M

Cal. Due 5-14-00

SKETCH:

Bkgd 11 602 cpm

walkover 8000 - 15 000 cpm

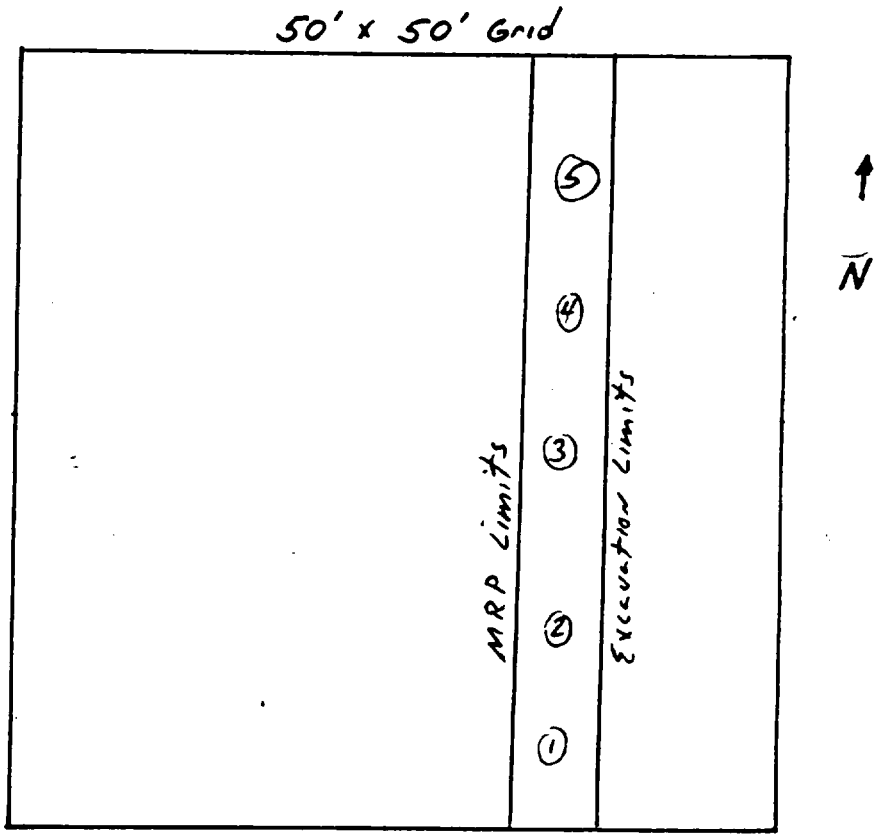
1 10 420 cpm

2 10 680 cpm

3 10 957 cpm

4 11 421 cpm

5 10530 cpm



REMARKS: #99102208 (Sample ID)

All readings < 2 times Bkg

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: T. Blakeslee / T. Blakeslee / 100141

Reviewed by: R Zemberger Date: 10/25/99

Millennium MRP Remediation Project
Radiological Surveillance Summary Report
for
Work Week of 10/25/99 – 10/29/99

Perimeter Air Sample Results			
Sample Period	**Location**	**Concentration** (µCi/ml)	**%P_{CGL}** [1),2),3)]
Oct 26 – Nov 2	Landfill North	1.6E-14	120% P_{CGL} [4)]
	Landfill East	2.9E-15	22% P_{CGL}
	Landfill South	6.2E-15	47% P_{CGL}
	Landfill West	8.2E-15	63 % P_{CGL} [4)]

1) Perimeter Concentration Guideline Level (P_{CGL}); Permissible Effluent Concentration applicable to assessment of dose to the public.
2) P_{CGL} for the Millennium MRP Excavation Project is 1.3E-14 µCi/ml (based on radionuclides present in MRP material).
3) Action level for evaluation of public exposure is 100% of P_{CGL}.
4) Perimeter Air Sample will be reanalyzed after 10 days.
5) Perimeter Air Sampling for the MRP Excavation Site was discontinued on Oct 26, 1999.

Personnel Contamination Incidence (PCI)

No PCIs detected.

Area/Equipment Contamination

No Area/Equipment contamination detected.

Grid Surveys				
Grid ID	**Survey Date**	**Scan Survey** [1)] **Result (Fidler)**	**Sample Results** [2)] (pCi/g; Ra-226&Ra-228)	**Comments**
73 North Under Cement Pad	10/28/99	<2 X Bkg	4.7	Elevated readings, measured during work week beginning 10/4/99 were remediated.

1) Detectable activity (hot spots) is measured as 2 times the background (2 X Bkg) measured in the grid.
2) Clean-up goal = 12 pCi/g (Ra-226&Ra-228)

Status of Radiation Work Permits (RWPs)

All areas within the MRP Remediation Work Plan have been remediated to no detectable levels (measured with a Fidler). All Radiological Work Permits (RWPs) for the MRP Excavation Site (i.e., 99-003 - MRP Excavation, 99-004 – MRP Sampling Activities & 99-006 – MRP Drum Recovery) were closed-out on 10/29/99.

The RWP 99-005 - Landfill work will remain active until MRP material is covered with clean material.

MK-FERGUSON OF OAK RIDGE COMPANY
A MORRISON KNUDSEN COMPANY

RADIOLOGICAL SURVEY REPORT (MAP)

SITE: MILLENIUM	DATE: Yr 99 Mo 10 Dy 28	Time: 1130	Page 1 of 1
RWP No. 99-004	WORK ORDER No. —	BLDG. No. —	

LOCATION: GRID 73 UNDER CONCRETE PAD

MAP KEY: N/A = SMEAR / LARGE AREA WIPE LOCATION N/A = AIR SAMPLE LOCATION

SKETCH:

GRID 73 UNDER CONCRETE PAD.

BKGD 16363

WALKOVER 15 K TO 20 K

AREA SHOVELED OUT TO REMOVE RESIDUAL CONTAMINATES.

AREA WHERE SAMPLE TAKEN 21810

REMARKS:

SURVEY TECHNICIAN(S) NAME / SIGNATURE / BADGE NUMBER: J. F. LEWIS / J F Lewis /

Reviewed by: K Jenenberg Date: 11/2/99

APPENDIX F
HEALTH AND SAFETY MONITORING RESULTS

APPENDIX F
HEALTH AND SAFETY MONITORING RESULTS

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SUMMARY OF $TiCl_4$ PLANT PCB PERIMETER AIR SAMPLING DATA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
6/24/99	352-99-B001	Therminol tank area, north boundary.	744	BDL
6/24/99	352-99-B002	Therminol tank area, west boundary.	622	BDL
6/24/99	352-99-B003	Therminol tank area, west boundary.	732	BDL
6/25/99	352-99-B004	Therminol tank area, north boundary.	943	0.00032 (d)
6/25/99	352-99-B005	Therminol tank area, west boundary.	939	0.00037 (d)
6/28/99	352-99-B006	Therminol tank area, west boundary.	1134	0.00044 (d)
6/28/99	352-99-B007	Therminol tank area, north boundary.	1134	0.0048 (d)
6/29/99	352-99-B008	Therminol tank area, north boundary.	1078	0.00034 (d)
6/29/99	352-99-B009	Therminol tank area, west boundary.	1076	0.0036 (d)
6/24/99	352-99-B010	Field Blank	N/A	BDL
6/28/99	352-99-B011	Field Blank	N/A	BDL
6/29/99	352-99-B012	Field Blank	N/A	BDL
6/30/99	352-99-B010B	Therminol tank area, west boundary.	979	0.0033 (d)
6/30/99	352-99-B011B	Therminol tank area, east boundary.	980	0.00071 (d)
7/1/99	352-99-B012B	Therminol tank area, west boundary.	958	0.026 (d)
7/1/99	352-99-B013	Therminol tank area, north boundary.	958	0.0066 (d)
7/2/99	352-99-B014	Therminol tank area, west boundary.	702	0.014 (d)
7/2/99	352-99-B015	Therminol tank area, northeast boundary.	703	0.0016 (d)
6/30/99	352-99-B016	Field Blank	N/A	BDL
7/1/99	352-99-B017	Field Blank	N/A	BDL
7/2/99	352-99-B018	Field Blank	N/A	BDL
7/6/99	352-99-B019	Field Blank	N/A	BDL
7/6/99	352-99-B016B	Therminol tank area, northwest boundary.	868	0.009 (d)
7/6/99	352-99-B017B	Therminol tank area, east boundary.	864	0.009 (d)
7/7/99	352-99-B018B	Therminol tank area, northwest boundary.	967	0.0078 (d)
7/7/99	352-99-B019B	Therminol tank area, northeast boundary.	964	0.0028 (d)
7/8/99	352-99-B020	Therminol tank area, northwest boundary.	1031	0.0076 (d)

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
7/22/99	352-99-B037	MRP area, south boundary.	1005	BDL
7/22/99	352-99-B038	MRP area, south boundary.	1019	BDL
7/22/99	352-99-BLANK 9	Field Blank	N/A	BDL
7/23/99	352-99-B039	MRP area, south boundary.	856	BDL
7/23/99	352-99-B040	MRP area, northwest boundary.	914	BDL
7/23/99	352-99-B041	MRP area, north boundary.	793	BDL
7/23/99	352-99-B042	MRP area, west boundary.	782	BDL
7/23/99	352-99-BLANK 10	Field Blank	N/A	BDL
7/24/99	352-99-B043	MRP area, south boundary.	1053	BDL
7/24/99	352-99-B044	MRP area, north boundary.	458	BDL
7/24/99	352-99-B045	MRP area, northeast boundary.	440	BDL
7/24/99	352-99-B046	MRP area, west boundary.	458	BDL
7/26/99	352-99-B047	MRP area, south boundary.	940	BDL
7/26/99	352-99-B048	MRP area, west boundary.	478	BDL
7/26/99	352-99-B049	MRP area, north boundary.	952	BDL
7/26/99	352-99-B050	MRP area, northeast boundary.	780	BDL
7/27/99	352-99-B051	MRP area, south boundary.	997	BDL
7/27/99	352-99-B052	MRP area, north boundary.	900	BDL
7/27/99	352-99-B053	MRP area, west boundary.	894	BDL
7/27/99	352-99-B054	MRP area, northeast boundary.	864	BDL
7/28/99	352-99-B055	MRP area, south boundary.trencher	786	BDL
7/28/99	352-99-B056	MRP area, northeast boundary.	737	BDL
7/28/99	352-99-B057	MRP area, north boundary.	734	BDL
7/28/99	352-99-B058	MRP area, west boundary.	276	0.0013 (d)
7/24/99	352-99-Blank 11	Field Blank	N/A	BDL
7/26/99	352-99-Blank 12	Field Blank	N/A	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
7/27/99	352-99-Blank 13	Field Blank	N/A	BDL
7/29/99	352-99-B059	MRP area, north boundary.	1020	BDL
7/29/99	352-99-B060	MRP area, south boundary.	1062	BDL
7/29/99	352-99-B061	MRP area, west boundary.	1024	BDL
7/29/99	352-99-B062	MRP area, northeast boundary.	1020	BDL
7/30/99	352-99-B063	MRP area, south boundary.	1056	BDL
7/30/99	352-99-B064	MRP area, north boundary.	842	BDL
7/30/99	352-99-B065	MRP area, west boundary.	832	BDL
7/30/99	352-99-B066	MRP area, northeast boundary.	914	BDL
7/30/99	352-99-Blank 14	Field Blank	N/A	BDL
8/2/99	352-99-B067	MRP area, south boundary.	1281	BDL
8/2/99	352-99-B068	MRP area, north boundary.	1015	BDL
8/2/99	352-99-B069	MRP area, west boundary.	1118	BDL
8/2/99	352-99-B070	MRP area, northeast boundary.	394	BDL
8/3/99	352-99-B071	MRP area, south boundary.	1179	BDL
8/3/99	352-99-B072	MRP area, north boundary.	1219	BDL
8/3/99	352-99-B073	MRP area, northeast boundary.	820	BDL
8/3/99	352-99-B074	MRP area, west boundary.	1216	BDL
8/4/99	352-99-B075	MRP area, south boundary.	1279	BDL
8/4/99	352-99-B076	MRP area, north boundary.	1170	BDL
8/4/99	352-99-B078	MRP area, west boundary.	1250	BDL
8/2/99	352-99-Blank 15	Field Blank	N/A	BDL
8/5/99	352-99-B079	MRP area, west boundary.	1098	BDL
8/5/99	352-99-B080	MRP area, north boundary.	1101	BDL
8/6/99	352-99-B081	MRP area, west boundary.	1150	BDL
8/6/99	352-99-B082	MRP area, north boundary.	1416	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
8/6/99	352-99-B083	MRP area, northeast boundary.	1076	BDL
8/6/99	352-99-B084	MRP area, south boundary.	1510	BDL
8/11/99	352-99-B084	MRP area, west boundary.	1018	BDL
8/7/99	352-99-B085	MRP area, northeast boundary.	904.2	BDL
8/7/99	352-99-B086	MRP area, south boundary.	897.9	BDL
8/7/99	352-99-B087	MRP area, north boundary.	890.2	BDL
8/9/99	352-99-B088	MRP area, south boundary.	1128	BDL
8/9/99	352-99-B089	MRP area, north boundary.	1182	BDL
8/9/99	352-99-B090	MRP area, northeast boundary.	1268	BDL
8/9/99	352-99-B091	MRP area, west boundary.	1106	BDL
8/10/99	352-99-B092	MRP area, north boundary.	1086	0.0011 (d)
8/10/99	352-99-B093	MRP area, northeast boundary.	1208	BDL
8/10/99	352-99-B094	MRP area, west boundary.	856	BDL
8/10/99	352-99-B095	MRP area, south boundary.	1228	BDL
8/11/99	352-99-B096	MRP area, north boundary.	1298	BDL
8/11/99	352-99-B097	MRP area, west boundary.	1250	BDL
8/11/99	352-99-B098	MRP area, north boundary.	1238	0.0019 (d)
8/12/99	352-99-B099	MRP area, south boundary.	1340	BDL
8/12/99	352-99-B100	MRP area, north boundary.	1294	0.00043 (d)
8/12/99	352-99-B101	MRP area, west boundary.	1302	BDL
8/16/99	352-99-B102	MRP area, south boundary.	1239	BDL
8/16/99	352-99-B103	MRP area, north boundary.	420	BDL
8/16/99	352-99-B104	MRP area, west boundary.	1222	BDL
8/17/99	352-99-B105	MRP area, south boundary.	1265	BDL
8/23/99	352-99-B106	MRP area, south boundary.	1143	BDL
8/23/99	352-99-B107	MRP area, northeast boundary.	2774	BDL
8/23/99	352-99-B108A	MRP area, west boundary.	1360	0.00021 (e)

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
8/24/99	352-99-B108B	MRP area, south boundary.	1157	BDL
8/24/99	352-99-B109	MRP area, west boundary.	628.7	BDL
8/27/99	352-99-B110	MRP area, south boundary.	1136	BDL
8/27/99	352-99-B111	MRP area, west boundary.	1051	BDL
8/27/99	352-99-B112	MRP area, northeast boundary.	1056	BDL
8/28/99	352-99-B113	MRP area, northeast boundary.	864.9	BDL
8/28/99	352-99-B114	MRP area, west boundary.	866.4	BDL
8/28/99	352-99-B115	MRP area, south boundary.	970.4	BDL
8/30/99	352-99-B116	MRP area, south boundary.	1245	BDL
8/30/99	352-99-B117	MRP area, west boundary.	1192	BDL
8/30/99	352-99-B118	MRP area, north boundary.	378	BDL
8/30/99	352-99-B119	MRP area, northeast boundary.	1191	BDL
8/31/99	352-99-B120	MRP area, south boundary.	1182	BDL
8/31/99	352-99-B121	MRP area, north boundary.	1171	BDL
8/31/99	352-99-B122	MRP area, west boundary.	1172	BDL
8/31/99	352-99-B123	MRP area, northeast boundary.	1171	BDL
9/1/99	352-99-B124	MRP area, south boundary.	1191	BDL
9/1/99	352-99-B125	MRP area, north boundary.	1188	BDL
9/1/99	352-99-B126	MRP area, west boundary.	1189	BDL
9/1/99	352-99-B127	MRP area, northeast boundary.	1212	BDL
9/2/99	352-99-B128	MRP area, south boundary.	1287	BDL
9/2/99	352-99-B129	MRP area, north boundary.	1188	BDL
9/2/99	352-99-B130	MRP area, west boundary.	1188	BDL
9/2/99	352-99-B131	MRP area, northeast boundary.	1188	BDL
9/3/99	352-99-B132	MRP area, south boundary.	987.9	BDL
9/3/99	352-99-B133	MRP area, northeast boundary.	947.3	BDL
9/3/99	352-99-B134	MRP area, west boundary.	946	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
9/3/99	352-99-B135	MRP area, north boundary.	943.8	BDL
9/7/99	352-99-B136	MRP area, north boundary.	1098	BDL
9/7/99	352-99-B137	MRP area, west boundary.	1076	BDL
9/7/99	352-99-B138	MRP area, northeast boundary.	1082	BDL
9/7/99	352-99-B139	MRP area, south boundary.	1204	BDL
9/8/99	352-99-B139B	MRP area, south boundary.	1163	BDL
9/8/99	352-99-B140	MRP area, north boundary.	1118	BDL
9/8/99	352-99-B141	MRP area, west boundary.	1141	BDL
9/8/99	352-99-B142	MRP area, northeast boundary.	1142	BDL
9/9/99	352-99-B143	MRP area, south boundary.	1008	BDL
9/9/99	352-99-B144	MRP area, north boundary.	1002	BDL
9/9/99	352-99-B145	MRP area, west boundary.	1000	BDL
9/10/99	352-99-B146	MRP area, north boundary.	1077	BDL
9/10/99	352-99-B147	MRP area, west boundary.	1075	BDL
9/10/99	352-99-B148	MRP area, northeast boundary.	1070	BDL
9/14/99	352-99-B149	MRP area, south boundary.	1482	BDL
9/14/99	352-99-B150	MRP area, west boundary.	1070	BDL
9/14/99	352-99-B151	MRP area, north boundary.	1068	BDL
9/14/99	352-99-B152	MRP area, northeast boundary.	1070	BDL
9/15/99	352-99-B153	MRP area, west boundary.	1071	BDL
9/15/99	352-99-B154	MRP area, south boundary.	1165	BDL
9/15/99	352-99-B155	MRP area, north boundary.	1086	BDL
9/16/99	352-99-B156	MRP area, south boundary.	1204	BDL
9/16/99	352-99-B157	MRP area, west boundary.	1244	BDL
9/16/99	352-99-B158	MRP area, northeast boundary.	1260	BDL
9/17/99	352-99-B159	MRP area, south boundary.	1125	BDL
9/17/99	352-99-B160	MRP area, west boundary.	1015	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
9/17/99	352-99-B161	MRP area, northeast boundary.	1022	BDL
9/21/99	352-99-B162	MRP area, south boundary.	110	BDL
9/21/99	352-99-B163	MRP area, west boundary.	1190	BDL
9/21/99	352-99-B164	MRP area, northeast boundary.	1184	BDL
9/22/99	352-99-B165	MRP area, south boundary.	88	BDL
9/22/99	352-99-B166	MRP area, west boundary.	1225	BDL
9/22/99	352-99-B167	MRP area, northeast boundary.	1216	BDL
9/23/99	352-99-B168	MRP area, south boundary.	1253	BDL
9/23/99	352-99-B169	MRP area, northeast boundary.	1219	BDL
9/23/99	352-99-B170	MRP area, west boundary.	80	BDL
9/25/99	352-99-B171	MRP area, south boundary.	333	BDL
9/25/99	352-99-B172	MRP area, west boundary.	342	BDL
9/25/99	352-99-B173	MRP area, northeast boundary.	60	BDL
9/27/99	352-99-B174	MRP area, west boundary.	121	BDL
9/27/99	352-99-B175	MRP area, northeast boundary.	1115	BDL
9/28/99	352-99-B176	MRP area, west boundary.	1184	BDL
9/28/99	352-99-B177	MRP area, northeast boundary.	1191	BDL
10/1/99	352-99-B178	MRP area, west boundary.	1201	BDL
10/1/99	352-99-B179	MRP area, northeast boundary.	1201	BDL
10/4/99	352-99-B180	MRP area, northeast boundary.	288.4	BDL
10/4/99	352-99-B181	MRP area, west boundary.	344	BDL
10/6/99	352-99-B182	MRP area, west boundary.	755.8	BDL
10/6/99	352-99-B183	MRP area, northeast boundary.	1060	BDL
10/7/99	352-99-B184	MRP area, west boundary.	1152	BDL
10/7/99	352-99-B185	MRP area, northeast boundary.	1184	BDL
10/7/99	352-99-B185B	MRP area, west boundary.	1690	BDL
10/8/99	352-99-B186	MRP area, northeast boundary.	165	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	Results (mg/m^3)
10/11/99	352-99-B187	MRP area, northeast boundary.	1184	BDL
10/11/99	352-99-B188	MRP area, west boundary.	1165	BDL
10/12/99	352-99-B189	MRP area, northeast boundary,.	1114	BDL
10/12/99	352-99-B190	MRP area, west boundary.	1108	BDL
10/13/99	352-99-B191	MRP area, northeast boundary.	1067	BDL
10/13/99	352-99-B192	MRP area, west boundary.	1035	BDL
10/14/99	352-99-B193	MRP area, northeast boundary.	1110	BDL
10/14/99	352-99-B194	MRP area, west boundary.	1126	BDL
10/15/99	352-99-B195	MRP area, west boundary.	1120	BDL
10/15/99	352-99-B196	MRP area, northeast boundary.	1154	BDL

* OSHA PEL = 1 mg/m^3

Notes:

(a) Aroclor 1016
(b) Aroclor 1221
(c) Aroclor 1232
(d) Aroclor 1242
(e) Aroclor 1248
(f) Aroclor 1254
(g) Aroclor 1260

SUMMARY OF $TiCl_4$ PLANT PCB PERSONAL AIR MONITORING DATA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
6/25/99	352-99-P001	Personal - Laborer.	500	0.0024 (e)
6/25/99	352-99-P002	Personal - Operator.	995	0.0017 (e)
6/28/99	352-99-P003	Personal - Laborer.	1024	0.0056 (e)
6/28/99	352-99-P004	Personal - Operator.	1150	0.0049 (e)
6/29/99	352-99-P005	Personal - Laborer.	936	0.010 (e)
6/29/99	352-99-P006	Personal - Operator.	1135	0.0041 (e)
6/30/99	352-99-P007	Personal (Ed Reynolds).	1040	0.0039 (d)
7/1/99	352-99-P008	Personal(Ed Reynolds).	1000	0.007 (d)
7/1/99	352-99-P009	Personal (Track hoe).	374	0.0054 (d)
7/2/99	352-99-P010	Personal (Track hoe).	651	0.011 (d)
7/2/99	352-99-P011	Personal (Ed Reynolds).	496	0.0081 (d)
7/6/99	352-99-P012	Personal (Steve Arnett-trackhoe).	899	0.0098 (d)
7/6/99	352-99-P013	Personal (Ed Reynolds-laborer).	850	0.0088 (d)
7/7/99	352-99-P014	Personal (Ed Reynolds-Laborer).	635	0.0088 (d)
7/7/99	352-99-P015	Personal (Steve Arnett - Machine).	698	0.0097 (d)
7/8/99	352-99-P016	Personal (Ed Reynolds-Laborer).	796	0.014 (d)
7/9/99	352-99-P017	Personal (Ed Reynolds-Laborer).	851	0.086 (d)
7/12/99	352-99-P018	Personal (Ed Reynolds-Laborer).	792	0.01 (d)
7/13/99	352-99-P019	Personal (Ed Reynolds-Laborer).	696	0.016 (d)
7/14/99	352-99-P020	Personal (Ed Reynolds-Laborer).	250	0.012 (d)
7/15/99	352-99-P021	Personal (Ed Reynolds-Laborer).	702	0.015 (d)
7/16/99	352-99-P022	Personal (Ed Reynolds-Laborer).	270	0.0017 (d)
7/20/99	352-99-P023	Personal (Ed Reynolds-Laborer).	449.5	0.0017 (d)
7/22/99	352-99-P024	Personal (Victor Bojadzic-Laborer).	265	0.0021 (d)
7/22/99	352-99-P025	Personal (Mike Cole-Laborer).	827.8	BDL
7/23/99	352-99-P026	Personal (Andy Kendera-Laborer).	478.9	0.0013 (d)
7/23/99	352-99-P027	Personal (Jason Smyrak-Operator).	613	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
7/24/99	352-99-P028	Personal (Andy Kendera-Laborer).	541	BDL
7/26/99	352-99-P029	Personal (Wayne Schmitz-Operator).	436	BDL
7/26/99	352-99-P030	Personal (Andy Kendera-Laborer).	522	BDL
7/27/99	352-99-P031	Personal (Andy Kendera-Laborer).	449	BDL
7/27/99	352-99-P032	Personal (Kai Yee-Laborer).	200	0.0013 (d)
7/28/99	352-99-P033	Personal (Moe Fryer-Laborer).	396	0.00076 (d)
7/28/99	352-99-P034	Personal (Dan Stewart-Laborer).	599	0.0012 (d)
7/29/99	352-99-P035	Personal (Unknown-Sweeper).	892	BDL
7/29/99	352-99-P036	Personal (Dan Stewart-Laborer).	645	BDL
7/30/99	352-99-P037	Personal (Ed Reynolds-Laborer).	404	0.00062 (d)
7/30/99	352-99-P038	Personal (Dan Stewart-Laborer).	603	BDL
8/2/99	352-99-P039	Personal (Ed Reynolds-Laborer).	391.2	0.001 (d)
8/2/99	352-99-P040	Personal (Wayne Schmitz-Track Hoe-220).	1198	0.00046 (d)
8/2/99	352-99-P041	Personal (Andy Kendera-Laborer).	1139	BDL
8/3/99	352-99-P042	Personal (Ed Reynolds-Laborer).	577.3	0.0035 (d)
8/3/99	352-99-P043	Personal (Jason Smyrak- Track Hoe-220).	1364	BDL
8/3/99	352-99-P044	Personal (Andy Rendera-Laborer).	1207	0.00035 (d)
8/4/99	352-99-P045	Personal (Ed Reynolds-Laborer).	600.7	0.0038 (d)
8/4/99	352-99-P045B	Personal (Ed Reynolds).	556	BDL
8/4/99	352-99-P046	Personal (Andy Kendera-Laborer).	1194	0.00023 (d)
8/4/99	352-99-P047	Personal (Wayne Schmitz-Track Hoe 220).	330.3	BDL
8/7/99	352-99-P048	Personal (Andy Kendera-Laborer).	1252	BDL
8/9/99	352-99-P049	Personal (Dan Stewart-Laborer).	1067	0.00056 (d)
8/9/99	352-99-P050	Personal (Ed Reynolds-Laborer).	980	0.00026 (d)
8/9/99	352-99-P051	Personal (Machine-Track Hoe 220).	1240	0.0029 (d)
8/10/99	352-99-P052	Personal (Ed Reynolds-Laborer).	828.7	0.0024 (d)
8/10/99	352-99-P053	Personal (Dan Stewart-Laborer).	1058	0.0038 (d)

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
8/10/99	352-99-P054	Personal (Machine-Track Hoe 220).	1117	0.0028 (d)
8/11/99	352-99-P055	Personal (Machine-Track Hoe 220).	1172	0.011 (d)
8/11/99	352-99-P056	Personal (Ed Reynolds-Laborer).	1086	0.00078 (d)
8/11/99	352-99-P057	Personal (Dan Stewart-Laborer).	996	0.0016(d)
8/12/99	352-99-P058	Personal (Dan Stewart-Laborer).	1084	0.0015 (d)
8/12/99	352-99-P059	Personal (Jason Smyrak-220 excavator).	1209	0.0026 (d)
8/12/99	352-99-P060	Personal (Ed Reynolds-Laborer).	884	0.0004 (d)
8/16/99	352-99-P061	Personal (Ed Reynolds-Laborer).	738	0.00081 (d)
8/16/99	352-99-P062	Personal (Dan Stewart-Laborer).	380	BDL
8/16/99	352-99-P063	Personal (Machine-220).	1169	0.00035 (d)
8/17/99	352-99-P064	Personal (Ed Reynolds-Laborer).	589.3	0.0014 (e)
8/17/99	352-99-P065	Personal (Dan Stewart-Laborer).	1206	BDL
8/23/99	352-99-P066	Personal (Ed Reynolds-Laborer).	554	BDL
8/23/99	352-99-P067	Personal (Dan Stewart-Laborer).	548.3	0.00051 (e)
8/23/99	352-99-P068	Personal (Machine).	114	BDL
8/24/99	352-99-P069	Personal (Ed Reynolds-Laborer).	1260	BDL
8/27/99	352-99-P070	Personal (Ed Reyolds-Laborer).	254	BDL
8/28/99	352-99-P071	Personal (Ed Reyolds-Laborer).	255	BDL
8/30/99	352-99-P072	Personal (Ed Reyolds-Laborer).	534	BDL
8/31/99	352-99-P073	Personal (Ed Reyolds-Laborer).	548	BDL
9/1/99	352-99-P073	Personal (Ed Reyolds-Laborer).	493.2	BDL
9/2/99	352-99-P074	Personal (Ed Reyolds-Laborer).	430.9	BDL
9/3/99	352-99-P075	Personal (Ed Reyolds-Laborer).	318	BDL
9/7/99	352-99-P076	Personal (Ed Reyolds-Laborer).	504	BDL
9/8/99	352-99-P077	Personal (Ed Reyolds-Laborer).	306.1	BDL
9/9/99	352-99-P078	Personal (Ed Reyolds-Laborer).	526	BDL
9/10/99	352-99-P079	Personal (Ed Reyolds-Laborer).	469.1	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
9/15/99	352-99-P080	Personal (Ed Reyolds-Laborer).	1268	BDL
9/16/99	352-99-P081	Personal (Ed Reyolds-Laborer).	968	BDL
9/17/99	352-99-P082	Personal (Ed Reyolds-Laborer).	448	BDL
9/21/99	352-99-P083	Personal (Ed Reyolds-Laborer).	713.9	BDL
9/22/99	352-99-P084	Personal (Ed Reyolds-Laborer).	365	BDL
9/23/99	352-99-P085	Personal (Ed Reyolds-Laborer).	437	BDL
9/27/99	352-99-P086	Personal (Ed Reyolds-Laborer).	988	BDL
9/27/99	352-99-P087	Personal (Ed Reyolds-Laborer).	527	BDL
9/28/99	352-99-P088	Personal (Ed Reyolds-Laborer).	587	BDL
10/1/99	352-99-P089	Personal (Ed Reyolds-Laborer).	611.3	BDL
10/4/99	352-99-P089B	Personal (Ed Reyolds-Laborer).	485	BDL
10/6/99	352-99-P090	Personal (Ed Reyolds-Laborer).	300	BDL
10/7/99	352-99-P091	Personal (Ed Reyolds-Laborer).	524	BDL
10/8/99	352-99-P092	Personal (Ed Reyolds-Laborer).	263	BDL
10/11/99	352-99-P093	Personal (Ed Reyolds-Laborer).	507	BDL
10/12/99	352-99-P094	Personal (Ed Reyolds-Laborer).	259	BDL
10/13/99	352-99-P095	Personal (Ed Reyolds-Laborer).	262	BDL
10/14/99	352-99-P096	Personal (Ed Reyolds-Laborer).	656	BDL
10/18/99	352-99-P098	Personal (Anson Reyolds-Laborer).	450	BDL
10/18/99	352-99-P099	Personal (Ed Reyolds-Laborer).	598	BDL
10/19/99	352-99-P100	Personal (Anson Reyolds-Laborer).	869	BDL
10/19/99	352-99-P101	Personal (Ed Reyolds-Laborer).	740	BDL
10/21/99	352-99-P102	Personal (Ed Reyolds-Laborer).	725	BDL
10/21/99	352-99-P103	Personal (Anson Reyolds-Laborer).	357	BDL
10/22/99	352-99-P104	Personal (Anson Reyolds-Laborer).	805	BDL
10/22/99	352-99-P105	Personal (Ed Reyolds-Laborer).	893.4	0.0037
10/26/99	352-99-P104B	Personal (Ed Reyolds-Laborer).	517.6	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
10/26/99	352-99-P106	Personal (Anson Reyolds-Laborer).	882.8	BDL
10/27/99	352-99-P107	Personal (Anson Reyolds-Laborer).	871.5	BDL

* OSHA PEL = 1 mg/m^3

Notes:

(a) Aroclor 1016
(b) Aroclor 1221
(c) Aroclor 1232
(d) Aroclor 1242
(e) Aroclor 1248
(f) Aroclor 1254
(g) Aroclor 1260

SUMMARY OF LANDFILL PCB PERIMETER AIR SAMPLING DATA

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
7/27/99	ML-001N	Area M.I.C. Landfill, North Perimeter Monitoring	1099	BDL
7/27/99	ML-001S	Area M.I.C. Landfill, South Perimeter Monitoring	1090	BDL
7/27/99	ML-001E	Area M.I.C. Landfill, East Perimeter Monitoring	1059	BDL
7/27/99	ML-001W	Area M.I.C. Landfill, West Perimeter Monitoring	1071	BDL
7/28/99	ML-002N	Area M.I.C. Landfill, North Perimeter Monitoring	1080	BDL
7/28/99	ML-002S	Area M.I.C. Landfill, South Perimeter Monitoring	1086	BDL
7/28/99	ML-002E	Area M.I.C. Landfill, East Perimeter Monitoring	1091	BDL
7/28/99	ML-002W	Area M.I.C. Landfill, West Perimeter Monitoring	1083	BDL
7/29/99	ML-003N	Area M.I.C. Landfill, North Perimeter Monitoring	873	BDL
7/29/99	ML-003S	Area M.I.C. Landfill, South Perimeter Monitoring	779	BDL
7/29/99	ML-003E	Area M.I.C. Landfill, East Perimeter Monitoring	865	BDL
7/29/99	ML-003W	Area M.I.C. Landfill, West Perimeter Monitoring	855	BDL
7/30/99	ML-004N	Area M.I.C. Landfill, North Perimeter Monitoring	1192	BDL
7/30/99	ML-004S	Area M.I.C. Landfill, South Perimeter Monitoring	1187	BDL
7/30/99	ML-004E	Area M.I.C. Landfill, East Perimeter Monitoring	1190	BDL
7/30/99	ML-004W	Area M.I.C. Landfill, West Perimeter Monitoring	1182	BDL
8/2/99	ML-005N	Area M.I.C. Landfill, North Perimeter Monitoring	1253	BDL
8/2/99	ML-005S	Area M.I.C. Landfill, South Perimeter Monitoring	1272	BDL
8/2/99	ML-005E	Area M.I.C. Landfill, East Perimeter Monitoring	1285	BDL
8/2/99	ML-005W	Area M.I.C. Landfill, West Perimeter Monitoring	1273	BDL
8/3/99	ML-006N	Area M.I.C. Landfill, North Perimeter Monitoring	1227	BDL
8/3/99	ML-006S	Area M.I.C. Landfill, South Perimeter Monitoring	1301	BDL
8/3/99	ML-006E	Area M.I.C. Landfill, East Perimeter Monitoring	1233	BDL
8/3/99	ML-006W	Area M.I.C. Landfill, West Perimeter Monitoring	1278	BDL
8/4/99	ML-007N	Area M.I.C. Landfill, North Perimeter Monitoring	1276	BDL
8/4/99	ML-007S	Area M.I.C. Landfill, South Perimeter Monitoring	1274	BDL
8/4/99	ML-007E	Area M.I.C. Landfill, East Perimeter Monitoring	1305	BDL
8/4/99	ML-007W	Area M.I.C. Landfill, West Perimeter Monitoring	1370	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
8/5/99	ML-008N	Area M.I.C. Landfill, North Perimeter Monitoring	291.4	BDL
8/5/99	ML-008S	Area M.I.C. Landfill, South Perimeter Monitoring	295.8	BDL
8/5/99	ML-008E	Area M.I.C. Landfill, East Perimeter Monitoring	270.6	BDL
8/5/99	ML-008W	Area M.I.C. Landfill, West Perimeter Monitoring	264.7	BDL
8/6/99	ML-009N	Area M.I.C. Landfill, North Perimeter Monitoring	1297	BDL
8/6/99	ML-009S	Area M.I.C. Landfill, South Perimeter Monitoring	1030	BDL
8/6/99	ML-009E	Area M.I.C. Landfill, East Perimeter Monitoring	1292	BDL
8/6/99	ML-009W	Area M.I.C. Landfill, West Perimeter Monitoring	1297	BDL
8/7/99	ML-010N	Area M.I.C. Landfill, North Perimeter Monitoring	1123	BDL
8/7/99	ML-010S	Area M.I.C. Landfill, South Perimeter Monitoring	1117	BDL
8/7/99	ML-010E	Area M.I.C. Landfill, East Perimeter Monitoring	1127	BDL
8/7/99	ML-010W	Area M.I.C. Landfill, West Perimeter Monitoring	1117	BDL
8/9/99	ML-011N	Area M.I.C. Landfill, North Perimeter Monitoring	1282	0.0005 (d)
8/9/99	ML-011S	Area M.I.C. Landfill, South Perimeter Monitoring	1309	BDL
8/9/99	ML-011E	Area M.I.C. Landfill, East Perimeter Monitoring	1262	BDL
8/9/99	ML-011W	Area M.I.C. Landfill, West Perimeter Monitoring	1268	0.00022 (d)
8/10/99	ML-012N	Area M.I.C. Landfill, North Perimeter Monitoring	1291	BDL
8/10/99	ML-012S	Area M.I.C. Landfill, South Perimeter Monitoring	1285	BDL
8/10/99	ML-012E	Area M.I.C. Landfill, East Perimeter Monitoring	1325	0.00049 (d)
8/10/99	ML-012W	Area M.I.C. Landfill, West Perimeter Monitoring	1331	0.00026 (d)
8/11/99	ML-013N	Area M.I.C. Landfill, North Perimeter Monitoring	1245	BDL
8/11/99	ML-013S	Area M.I.C. Landfill, South Perimeter Monitoring	1236	0.001 (d)
8/11/99	ML-013E	Area M.I.C. Landfill, East Perimeter Monitoring	1248	BDL
8/11/99	ML-013W	Area M.I.C. Landfill, West Perimeter Monitoring	1253	0.0002 (d)
8/12/99	ML-014N	Area M.I.C. Landfill, North Perimeter Monitoring	1264	BDL
8/12/99	ML-014S	Area M.I.C. Landfill, South Perimeter Monitoring	1265	BDL
8/12/99	ML-014E	Area M.I.C. Landfill, East Perimeter Monitoring	1265	0.00024 (e)
8/12/99	ML-014W	Area M.I.C. Landfill, West Perimeter Monitoring	1279	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
8/13/99	ML-015N	Area M.I.C. Landfill, North Perimeter Monitoring	1171	BDL
8/13/99	ML-015S	Area M.I.C. Landfill, South Perimeter Monitoring	1176	BDL
8/13/99	ML-015E	Area M.I.C. Landfill, East Perimeter Monitoring	1173	BDL
8/13/99	ML-015W	Area M.I.C. Landfill, West Perimeter Monitoring	1176	BDL
8/16/99	ML-016N	Area M.I.C. Landfill, North Perimeter Monitoring	1237	BDL
8/16/99	ML-016S	Area M.I.C. Landfill, South Perimeter Monitoring	1226	0.0002 (e)
8/16/99	ML-016E	Area M.I.C. Landfill, East Perimeter Monitoring	1223	BDL
8/16/99	ML-016W	Area M.I.C. Landfill, West Perimeter Monitoring	1242	0.00035 (e)
8/17/99	ML-017N	Area M.I.C. Landfill, North Perimeter Monitoring	1246	BDL
8/17/99	ML-017S	Area M.I.C. Landfill, South Perimeter Monitoring	1255	BDL
8/17/99	ML-017E	Area M.I.C. Landfill, East Perimeter Monitoring	1239	BDL
8/17/99	ML-017W	Area M.I.C. Landfill, West Perimeter Monitoring	1215	BDL
8/18/99	ML-018N	Area M.I.C. Landfill, North Perimeter Monitoring	1244	BDL
8/18/99	ML-018S	Area M.I.C. Landfill, South Perimeter Monitoring	1184	0.0003 (e)
8/18/99	ML-018E	Area M.I.C. Landfill, East Perimeter Monitoring	1182	BDL
8/18/99	ML-018W	Area M.I.C. Landfill, West Perimeter Monitoring	1255	BDL
8/19/99	ML-019N	Area M.I.C. Landfill, North Perimeter Monitoring	1190	BDL
8/19/99	ML-019S	Area M.I.C. Landfill, South Perimeter Monitoring	1188	BDL
8/19/99	ML-019E	Area M.I.C. Landfill, East Perimeter Monitoring	1178	BDL
8/19/99	ML-019W	Area M.I.C. Landfill, West Perimeter Monitoring	1206	0.0005 (e)
8/23/99	ML-020N	Area M.I.C. Landfill, North Perimeter Monitoring	1081	BDL
8/23/99	ML-020S	Area M.I.C. Landfill, South Perimeter Monitoring	1026	BDL
8/23/99	ML-020E	Area M.I.C. Landfill, East Perimeter Monitoring	1036	BDL
8/23/99	ML-020W	Area M.I.C. Landfill, West Perimeter Monitoring	1026	0.00048 (e)
8/24/99	ML-021N	Area M.I.C. Landfill, North Perimeter Monitoring	1163	BDL
8/24/99	ML-021S	Area M.I.C. Landfill, South Perimeter Monitoring	1177	BDL
8/24/99	ML-021E	Area M.I.C. Landfill, East Perimeter Monitoring	1173	BDL
8/24/99	ML-021W	Area M.I.C. Landfill, West Perimeter Monitoring	1156	0.0003 (e)

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
8/27/99	ML-022N	Area M.I.C. Landfill, North Perimeter Monitoring	1207	0.00054 (e)
8/27/99	ML-022S	Area M.I.C. Landfill, South Perimeter Monitoring	1209	BDL
8/27/99	ML-022E	Area M.I.C. Landfill, East Perimeter Monitoring	1205	BDL
8/27/99	ML-022W	Area M.I.C. Landfill, West Perimeter Monitoring	1228	BDL
8/28/99	ML-023N	Area M.I.C. Landfill, North Perimeter Monitoring	1052	BDL
8/28/99	ML-023S	Area M.I.C. Landfill, South Perimeter Monitoring	1050	BDL
8/28/99	ML-023E	Area M.I.C. Landfill, East Perimeter Monitoring	1064	BDL
8/28/99	ML-023W	Area M.I.C. Landfill, West Perimeter Monitoring	1052	BDL
8/30/99	ML-024N	Area M.I.C. Landfill, North Perimeter Monitoring	1194	BDL
8/30/99	ML-024S	Area M.I.C. Landfill, South Perimeter Monitoring	1184	BDL
8/30/99	ML-024E	Area M.I.C. Landfill, East Perimeter Monitoring	1191	BDL
8/30/99	ML-024W	Area M.I.C. Landfill, West Perimeter Monitoring	1213	0.00031 (e)
8/31/99	ML-025N	Area M.I.C. Landfill, North Perimeter Monitoring	1223	0.00023 (e)
8/31/99	ML-025S	Area M.I.C. Landfill, South Perimeter Monitoring	1249	0.00072 (e)
8/31/99	ML-025E	Area M.I.C. Landfill, East Perimeter Monitoring	1242	BDL
8/31/99	ML-025W	Area M.I.C. Landfill, West Perimeter Monitoring	1248	BDL
9/1/99	ML-026N	Area M.I.C. Landfill, North Perimeter Monitoring	1156	0.0003 (e)
9/1/99	ML-026S	Area M.I.C. Landfill, South Perimeter Monitoring	1162	BDL
9/1/99	ML-026E	Area M.I.C. Landfill, East Perimeter Monitoring	1160	BDL
9/1/99	ML-026W	Area M.I.C. Landfill, West Perimeter Monitoring	1189	0.00039 (e)
9/2/99	ML-027N	Area M.I.C. Landfill, North Perimeter Monitoring	1176	BDL
9/2/99	ML-027S	Area M.I.C. Landfill, South Perimeter Monitoring	1158	0.0004 (e)
9/2/99	ML-027E	Area M.I.C. Landfill, East Perimeter Monitoring	1164	0.0004 (e)
9/2/99	ML-027W	Area M.I.C. Landfill, West Perimeter Monitoring	1211	BDL
9/3/99	ML-028N	Area M.I.C. Landfill, North Perimeter Monitoring	956.5	BDL
9/3/99	ML-028S	Area M.I.C. Landfill, South Perimeter Monitoring	957	BDL
9/3/99	ML-028E	Area M.I.C. Landfill, East Perimeter Monitoring	951.8	0.00028 (e)
9/3/99	ML-028W	Area M.I.C. Landfill, West Perimeter Monitoring	948	0.00038 (e)

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
9/7/99	ML-029N	Area M.I.C. Landfill, North Perimeter Monitoring	1211	BDL
9/7/99	ML-029S	Area M.I.C. Landfill, South Perimeter Monitoring	1211	0.00034 (e)
9/7/99	ML-029E	Area M.I.C. Landfill, East Perimeter Monitoring	1205	BDL
9/7/99	ML-029W	Area M.I.C. Landfill, West Perimeter Monitoring	1216	BDL
9/8/99	ML-030N	Area M.I.C. Landfill, North Perimeter Monitoring	1212	BDL
9/8/99	ML-030S	Area M.I.C. Landfill, South Perimeter Monitoring	1178	BDL
9/8/99	ML-030E	Area M.I.C. Landfill, East Perimeter Monitoring	1166	BDL
9/8/99	ML-030W	Area M.I.C. Landfill, West Perimeter Monitoring	1227	BDL
9/9/99	ML-031N	Area M.I.C. Landfill, North Perimeter Monitoring	1136	BDL
9/9/99	ML-031S	Area M.I.C. Landfill, South Perimeter Monitoring	1113	BDL
9/9/99	ML-031E	Area M.I.C. Landfill, East Perimeter Monitoring	1100	BDL
9/9/99	ML-031W	Area M.I.C. Landfill, West Perimeter Monitoring	1120	BDL
9/10/99	ML-032N	Area M.I.C. Landfill, North Perimeter Monitoring	1203	BDL
9/10/99	ML-032S	Area M.I.C. Landfill, South Perimeter Monitoring	1191	BDL
9/10/99	ML-032E	Area M.I.C. Landfill, East Perimeter Monitoring	1183	BDL
9/10/99	ML-032W	Area M.I.C. Landfill, West Perimeter Monitoring	1207	BDL
9/11/99	ML-033N	Area M.I.C. Landfill, North Perimeter Monitoring	970.7	BDL
9/11/99	ML-033S	Area M.I.C. Landfill, South Perimeter Monitoring	1008	BDL
9/11/99	ML-033E	Area M.I.C. Landfill, East Perimeter Monitoring	1002	BDL
9/11/99	ML-033W	Area M.I.C. Landfill, West Perimeter Monitoring	963.7	BDL
9/13/99	ML-034N	Area M.I.C. Landfill, North Perimeter Monitoring	317.9	BDL
9/13/99	ML-034S	Area M.I.C. Landfill, South Perimeter Monitoring	320.9	BDL
9/13/99	ML-034E	Area M.I.C. Landfill, East Perimeter Monitoring	314.9	BDL
9/13/99	ML-034W	Area M.I.C. Landfill, West Perimeter Monitoring	321.6	BDL
9/14/99	ML-035N	Area M.I.C. Landfill, North Perimeter Monitoring	1224	BDL
9/14/99	ML-035S	Area M.I.C. Landfill, South Perimeter Monitoring	1232	BDL
9/14/99	ML-035E	Area M.I.C. Landfill, East Perimeter Monitoring	1220	BDL
9/14/99	ML-035W	Area M.I.C. Landfill, West Perimeter Monitoring	1223	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
9/15/99	ML-036N	Area M.I.C. Landfill, North Perimeter Monitoring	1216	BDL
9/15/99	ML-036S	Area M.I.C. Landfill, South Perimeter Monitoring	1192	BDL
9/15/99	ML-036E	Area M.I.C. Landfill, East Perimeter Monitoring	1208	BDL
9/15/99	ML-036W	Area M.I.C. Landfill, West Perimeter Monitoring	1223	0.00038 (e)
9/16/99	ML-037N	Area M.I.C. Landfill, North Perimeter Monitoring	1229	0.00022 (e)
9/16/99	ML-037S	Area M.I.C. Landfill, South Perimeter Monitoring	1221	BDL
9/16/99	ML-037E	Area M.I.C. Landfill, East Perimeter Monitoring	1238	BDL
9/16/99	ML-037W	Area M.I.C. Landfill, West Perimeter Monitoring	1241	BDL
9/17/99	ML-038N	Area M.I.C. Landfill, North Perimeter Monitoring	1223	BDL
9/17/99	ML-038S	Area M.I.C. Landfill, South Perimeter Monitoring	1204	BDL
9/17/99	ML-038E	Area M.I.C. Landfill, East Perimeter Monitoring	1210	BDL
9/17/99	ML-038W	Area M.I.C. Landfill, West Perimeter Monitoring	1221	BDL
9/18/99	ML-039N	Area M.I.C. Landfill, North Perimeter Monitoring	972.5	BDL
9/18/99	ML-039S	Area M.I.C. Landfill, South Perimeter Monitoring	967.4	BDL
9/18/99	ML-039E	Area M.I.C. Landfill, East Perimeter Monitoring	964.1	BDL
9/18/99	ML-039W	Area M.I.C. Landfill, West Perimeter Monitoring	975.9	BDL
9/20/99	ML-040N	Area M.I.C. Landfill, North Perimeter Monitoring	365.5	BDL
9/20/99	ML-040S	Area M.I.C. Landfill, South Perimeter Monitoring	356	BDL
9/20/99	ML-040E	Area M.I.C. Landfill, East Perimeter Monitoring	365.7	BDL
9/20/99	ML-040W	Area M.I.C. Landfill, West Perimeter Monitoring	359.7	BDL
9/21/99	ML-041N	Area M.I.C. Landfill, North Perimeter Monitoring	1188	BDL
9/21/99	ML-041S	Area M.I.C. Landfill, South Perimeter Monitoring	1165	BDL
9/21/99	ML-041E	Area M.I.C. Landfill, East Perimeter Monitoring	1179	BDL
9/21/99	ML-041W	Area M.I.C. Landfill, West Perimeter Monitoring	1193	BDL
9/22/99	ML-042N	Area M.I.C. Landfill, North Perimeter Monitoring	1129	BDL
9/22/99	ML-042S	Area M.I.C. Landfill, South Perimeter Monitoring	1169	BDL
9/22/99	ML-042E	Area M.I.C. Landfill, East Perimeter Monitoring	1179	BDL
9/22/99	ML-042W	Area M.I.C. Landfill, West Perimeter Monitoring	1199	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
9/23/99	ML-043N	Area M.I.C. Landfill, North Perimeter Monitoring	1268	BDL
9/23/99	ML-043S	Area M.I.C. Landfill, South Perimeter Monitoring	1260	BDL
9/23/99	ML-043E	Area M.I.C. Landfill, East Perimeter Monitoring	1272	BDL
9/23/99	ML-043W	Area M.I.C. Landfill, West Perimeter Monitoring	1281	BDL
9/24/99	ML-044N	Area M.I.C. Landfill, North Perimeter Monitoring	1205	BDL
9/24/99	ML-044S	Area M.I.C. Landfill, South Perimeter Monitoring	1196	BDL
9/24/99	ML-044E	Area M.I.C. Landfill, East Perimeter Monitoring	1183	BDL
9/24/99	ML-044W	Area M.I.C. Landfill, West Perimeter Monitoring	1208	BDL
9/25/99	ML-045N	Area M.I.C. Landfill, North Perimeter Monitoring	1025	BDL
9/25/99	ML-045S	Area M.I.C. Landfill, South Perimeter Monitoring	1068	BDL
9/25/99	ML-045E	Area M.I.C. Landfill, East Perimeter Monitoring	1084	BDL
9/25/99	ML-045W	Area M.I.C. Landfill, West Perimeter Monitoring	1024	BDL
9/27/99	ML-046N	Area M.I.C. Landfill, North Perimeter Monitoring	1214	BDL
9/27/99	ML-046S	Area M.I.C. Landfill, South Perimeter Monitoring	1203	BDL
9/27/99	ML-046E	Area M.I.C. Landfill, East Perimeter Monitoring	1209	BDL
9/27/99	ML-046W	Area M.I.C. Landfill, West Perimeter Monitoring	1213	BDL
9/28/99	ML-047N	Area M.I.C. Landfill, North Perimeter Monitoring	1231	BDL
9/28/99	ML-047S	Area M.I.C. Landfill, South Perimeter Monitoring	230.5	BDL
9/28/99	ML-047E	Area M.I.C. Landfill, East Perimeter Monitoring	1210	BDL
9/28/99	ML-047W	Area M.I.C. Landfill, West Perimeter Monitoring	1235	BDL
9/29/99	ML-048N	Area M.I.C. Landfill, North Perimeter Monitoring	226	BDL
9/29/99	ML-048S	Area M.I.C. Landfill, South Perimeter Monitoring	231	BDL
9/29/99	ML-048E	Area M.I.C. Landfill, East Perimeter Monitoring	232.8	BDL
9/29/99	ML-048W	Area M.I.C. Landfill, West Perimeter Monitoring	222	BDL
10/1/99	ML-049N	Area M.I.C. Landfill, North Perimeter Monitoring	1196	BDL
10/1/99	ML-049S	Area M.I.C. Landfill, South Perimeter Monitoring	1190	BDL
10/1/99	ML-049E	Area M.I.C. Landfill, East Perimeter Monitoring	1203	BDL
10/1/99	ML-049W	Area M.I.C. Landfill, West Perimeter Monitoring	1195	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
10/2/99	ML-050N	Area M.I.C. Landfill, North Perimeter Monitoring	951.2	BDL
10/2/99	ML-050S	Area M.I.C. Landfill, South Perimeter Monitoring	956	BDL
10/2/99	ML-050E	Area M.I.C. Landfill, East Perimeter Monitoring	947	BDL
10/2/99	ML-050W	Area M.I.C. Landfill, West Perimeter Monitoring	949	BDL
10/4/99	ML-051N	Area M.I.C. Landfill, North Perimeter Monitoring	1213	BDL
10/4/99	ML-051S	Area M.I.C. Landfill, South Perimeter Monitoring	1205	BDL
10/4/99	ML-051E	Area M.I.C. Landfill, East Perimeter Monitoring	1199	BDL
10/4/99	ML-051W	Area M.I.C. Landfill, West Perimeter Monitoring	1207	BDL
10/5/99	ML-052N	Area M.I.C. Landfill, North Perimeter Monitoring	1186	BDL
10/5/99	ML-052S	Area M.I.C. Landfill, South Perimeter Monitoring	1182	BDL
10/5/99	ML-052E	Area M.I.C. Landfill, East Perimeter Monitoring	1182	BDL
10/5/99	ML-052W	Area M.I.C. Landfill, West Perimeter Monitoring	1177	BDL
10/6/99	ML-053N	Area M.I.C. Landfill, North Perimeter Monitoring	1168	BDL
10/6/99	ML-053W	Area M.I.C. Landfill, West Perimeter Monitoring	1171	BDL
10/7/99	ML-054E	Area M.I.C. Landfill, East Perimeter Monitoring	1196	BDL
10/7/99	ML-054W	Area M.I.C. Landfill, West Perimeter Monitoring	1196	BDL
10/8/99	ML-055E	Area M.I.C. Landfill, East Perimeter Monitoring	1177	BDL
10/8/99	ML-055W	Area M.I.C. Landfill, West Perimeter Monitoring	1177	BDL
10/11/99	ML-056E	Area M.I.C. Landfill, East Perimeter Monitoring	550	BDL
10/11/99	ML-056W	Area M.I.C. Landfill, West Perimeter Monitoring	1177	BDL
10/12/99	ML-057E	Area M.I.C. Landfill, East Perimeter Monitoring	1136	BDL
10/12/99	ML-057W	Area M.I.C. Landfill, West Perimeter Monitoring	1060	BDL
10/13/99	ML-058E	Area M.I.C. Landfill, East Perimeter Monitoring	1046	BDL
10/13/99	ML-058W	Area M.I.C. Landfill, West Perimeter Monitoring	1052	BDL
10/14/99	ML-059N	Area M.I.C. Landfill, North Perimeter Monitoring	1112	BDL
10/14/99	ML-059S	Area M.I.C. Landfill, South Perimeter Monitoring	1120 (2)	BDL
10/14/99	ML-059E	Area M.I.C. Landfill, East Perimeter Monitoring	1200	BDL
10/14/99	ML-059W	Area M.I.C. Landfill, West Perimeter Monitoring	1112	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
10/15/99	ML-060N	Area M.I.C. Landfill, North Perimeter Monitoring	977.8	BDL
10/15/99	ML-060S	Area M.I.C. Landfill, South Perimeter Monitoring	1005	BDL
10/15/99	ML-060E	Area M.I.C. Landfill, East Perimeter Monitoring	1000	BDL
10/15/99	ML-060W	Area M.I.C. Landfill, West Perimeter Monitoring	974	BDL
10/18/99	ML-061N	Area M.I.C. Landfill, North Perimeter Monitoring	1001	BDL
10/18/99	ML-061S	Area M.I.C. Landfill, South Perimeter Monitoring	1024	BDL
10/18/99	ML-061E	Area M.I.C. Landfill, East Perimeter Monitoring	832	BDL
10/18/99	ML-061W	Area M.I.C. Landfill, West Perimeter Monitoring	1001	BDL
10/19/99	ML-062N	Area M.I.C. Landfill, North Perimeter Monitoring	1034	BDL
10/19/99	ML-062S	Area M.I.C. Landfill, South Perimeter Monitoring	873.6 (2)	BDL
10/19/99	ML-062E	Area M.I.C. Landfill, East Perimeter Monitoring	2 (2)	BDL (1)
10/19/99	ML-062W	Area M.I.C. Landfill, West Perimeter Monitoring	1035	BDL
10/20/99	ML-063N	Area M.I.C. Landfill, North Perimeter Monitoring	979.5	BDL
10/20/99	ML-063S	Area M.I.C. Landfill, South Perimeter Monitoring	756.2 (2)	BDL
10/20/99	ML-063W	Area M.I.C. Landfill, West Perimeter Monitoring	980	BDL
10/21/99	ML-064N	Area M.I.C. Landfill, North Perimeter Monitoring	977.7	BDL
10/21/99	ML-064S	Area M.I.C. Landfill, South Perimeter Monitoring	849.7 (2)	BDL
10/21/99	ML-064W	Area M.I.C. Landfill, West Perimeter Monitoring	972.1	BDL
10/22/99	ML-065N	Area M.I.C. Landfill, North Perimeter Monitoring	949.3	BDL
10/22/99	ML-065S	Area M.I.C. Landfill, South Perimeter Monitoring	766 (2)	BDL
10/22/99	ML-065W	Area M.I.C. Landfill, West Perimeter Monitoring	966.5	BDL
10/25/99	ML-066N	Area M.I.C. Landfill, North Perimeter Monitoring	869.6	BDL
10/25/99	ML-066S	Area M.I.C. Landfill, South Perimeter Monitoring	892 (2)	BDL
10/25/99	ML-066E	Area M.I.C. Landfill, East Perimeter Monitoring	896 (2)	BDL
10/25/99	ML-066W	Area M.I.C. Landfill, West Perimeter Monitoring	873.1	BDL
10/26/99	ML-067N	Area M.I.C. Landfill, North Perimeter Monitoring	969.1	BDL
10/26/99	ML-067S	Area M.I.C. Landfill, South Perimeter Monitoring	962	BDL
10/26/99	ML-067E	Area M.I.C. Landfill, East Perimeter Monitoring	960	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
10/26/99	ML-067W	Area M.I.C. Landfill, West Perimeter Monitoring	969.3	BDL
10/27/99	ML-068N	Area M.I.C. Landfill, North Perimeter Monitoring	1176	BDL
10/27/99	ML-068S	Area M.I.C. Landfill, South Perimeter Monitoring	1046	BDL
10/27/99	ML-068E	Area M.I.C. Landfill, East Perimeter Monitoring	1080 (3)	BDL
10/27/99	ML-068W	Area M.I.C. Landfill, West Perimeter Monitoring	1176	BDL
10/28/99	ML-069N	Area M.I.C. Landfill, North Perimeter Monitoring	783.2	BDL
10/28/99	ML-069S	Area M.I.C. Landfill, South Perimeter Monitoring	786	BDL
10/28/99	ML-069E	Area M.I.C. Landfill, East Perimeter Monitoring	780 (3)	BDL
10/28/99	ML-069W	Area M.I.C. Landfill, West Perimeter Monitoring	774.6	BDL
11/4/99	ML-070N	Area M.I.C. Landfill, North Perimeter Monitoring	521	BDL
11/4/99	ML-070S	Area M.I.C. Landfill, South Perimeter Monitoring	536	BDL
11/4/99	ML-070E	Area M.I.C. Landfill, East Perimeter Monitoring	530	BDL
11/4/99	ML-070W	Area M.I.C. Landfill, West Perimeter Monitoring	531.3	BDL
11/5/99	ML-071N	Area M.I.C. Landfill, North Perimeter Monitoring	1081	BDL
11/5/99	ML-071S	Area M.I.C. Landfill, South Perimeter Monitoring	1122	BDL
11/5/99	ML-071E	Area M.I.C. Landfill, East Perimeter Monitoring	32 (1)	BDL
11/5/99	ML-071W	Area M.I.C. Landfill, West Perimeter Monitoring	1114	BDL
11/6/99	ML-072N	Area M.I.C. Landfill, North Perimeter Monitoring	1160	BDL
11/6/99	ML-072S	Area M.I.C. Landfill, South Perimeter Monitoring	786	BDL
11/6/99	ML-072E	Area M.I.C. Landfill, East Perimeter Monitoring	1192 (2)	BDL
11/6/99	ML-072W	Area M.I.C. Landfill, West Perimeter Monitoring	1161	BDL
11/7/99	ML-073N	Area M.I.C. Landfill, North Perimeter Monitoring	1135	BDL
11/7/99	ML-073S	Area M.I.C. Landfill, South Perimeter Monitoring	588	BDL
11/7/99	ML-073E	Area M.I.C. Landfill, East Perimeter Monitoring	1260 (3)	BDL
11/7/99	ML-073W	Area M.I.C. Landfill, West Perimeter Monitoring	1177	BDL
11/8/99	ML-074N	Area M.I.C. Landfill, North Perimeter Monitoring	1137	BDL
11/8/99	ML-074S	Area M.I.C. Landfill, South Perimeter Monitoring	536	BDL
11/8/99	ML-074E	Area M.I.C. Landfill, East Perimeter Monitoring	1260 (3)	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Perimeter Air Sampling Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
11/8/99	ML-074W	Area M.I.C. Landfill, West Perimeter Monitoring	1181 (3)	BDL
11/9/99	ML-075N	Area M.I.C. Landfill, North Perimeter Monitoring	794.7	BDL
11/9/99	ML-075S	Area M.I.C. Landfill, South Perimeter Monitoring	812	BDL
11/9/99	ML-075E	Area M.I.C. Landfill, East Perimeter Monitoring	840 (3)	BDL
11/9/99	ML-075W	Area M.I.C. Landfill, West Perimeter Monitoring	804	BDL

* OSHA PEL = 1 mg/m^3

Notes:

(a) Aroclor 1016
(b) Aroclor 1221
(c) Aroclor 1232
(d) Aroclor 1242
(e) Aroclor 1248
(f) Aroclor 1254
(g) Aroclor 1260

Comments:

(1) Void - pump faulted
(2) Flow rate not reported - Volume is assumed.
(3) Elapsed time not reported - Volume is assumed.

SUMMARY OF LANDFILL PCB PERSONAL AIR MONITORING DATA

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
7/27/99	ML-001P	Personal (Andy Moore – Ramp Attendant)	1118	BDL
7/28/99	ML-002P	Personal (Andy Moore – Ramp Attendant)	1080	0.00039 (d)
7/29/99	ML-003P	Personal (Andy Moore – Ramp Attendant)	740	BDL
7/30/99	ML-004P	Personal (Andy Moore – Ramp Attendant)	1182	0.00024 (d)
8/2/99	ML-005 P	Personal (Andy Moore – Ramp Attendant)	1298	0.00042 (d)
8/3/99	ML-006 P	Personal (Andy Moore – Ramp Attendant)	1245	0.00068 (d)
8/4/99	ML-007 P	Personal (Andy Moore – Ramp Attendant)	1327	0.00083 (d)
8/5/99	ML-008 P	Personal (Andy Moore – Ramp Attendant)	311.6	BDL
8/6/99	ML-009 P	Personal (Andy Moore – Ramp Attendant)	1278	0.00043 (d)
8/7/99	ML-010 P	Personal (Andy Moore – Ramp Attendant)	1085	0.00023 (d)
8/9/99	ML-011 P	Personal (Andy Moore – Ramp Attendant)	1279	0.0011 (d)
8/10/99	ML-012 P1	Personal (Chuck Riley – Operator)	1320	BDL
8/10/99	ML-012 P2	Personal (Andy Moore – Ramp Attendant)	1319	0.00057 (d)
8/11/99	ML-013 P1	Personal (Chuck Riley – Operator)	320	BDL
8/11/99	ML-013 P2	Personal (Andy Moore – Ramp Attendant)	743	0.0012 (d)
8/12/99	ML-014 P1	Personal (Chuck Riley – Operator)	840	BDL
8/12/99	ML-014 P2	Personal (Andy Moore – Ramp Attendant)	1263	0.00079 (e)
8/13/99	ML-015 P1	Personal (Chuck Riley – Operator)	880	BDL
8/13/99	ML-015 P2	Personal (Andy Moore – Ramp Attendant)	1171	BDL
8/16/99	ML-016 P1	Personal (Chuck Riley – Operator)	880	BDL
8/16/99	ML-016 P2	Personal (Andy Moore – Ramp Attendant)	1135	0.0011 (e)
8/17/99	ML-017 P1	Personal (Chuck Riley – Operator)	840	BDL
8/17/99	ML-017 P2	Personal (Andy Moore – Ramp Attendant)	1217	0.00082 (e)
8/18/99	ML-018 P1	Personal (Chuck Riley – Operator)	960	BDL
8/18/99	ML-018 P2	Personal (Andy Moore – Ramp Attendant)	1175	0.0006 (e)
8/19/99	ML-019 P1	Personal (Chuck Riley – Operator)	240	BDL
8/19/99	ML-019 P2	Personal (Andy Moore – Ramp Attendant)	1195	0.00084 (e)
8/23/99	ML-020 P1	Personal (Chuck Riley – Operator)	560	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
8/23/99	ML-020 P2	Personal (Andy Moore – Ramp Attendant)	1041	0.00077 (e)
8/24/99	ML-021 P1	Personal (Chuck Riley – Operator)	560	BDL
8/24/99	ML-021 P2	Personal (Andy Moore – Ramp Attendant)	1148	0.00022 (e)
8/27/99	ML-022 P1	Personal (Chuck Riley – Operator)	840	BDL
8/27/99	ML-022 P2	Personal (Andy Moore – Ramp Attendant)	1226	0.00078 (e)
8/28/99	ML-023 P1	Personal (Chuck Riley – Operator)	480	BDL
8/28/99	ML-023 P2	Personal (Andy Moore – Ramp Attendant)	1065	BDL
8/30/99	ML-024 P1	Personal (Chuck Riley – Operator)	480	BDL
8/30/99	ML-024 P2	Personal (Andy Moore – Ramp Attendant)	1209	0.00035
8/31/99	ML-025 P1	Personal (Chuck Riley – Operator)	680	BDL
8/31/99	ML-025 P2	Personal (Andy Moore – Ramp Attendant)	1247	0.0006 (e)
9/1/99	ML-026 P1	Personal (Chuck Riley – Operator)	360	BDL
9/1/99	ML-026 P2	Personal (Andy Moore – Ramp Attendant)	1115	0.00041 (e)
9/2/99	ML-027 P1	Personal (Chuck Riley – Operator)	480	BDL
9/2/99	ML-027 P2	Personal (Andy Moore – Ramp Attendant)	1222	0.00053(e)
9/7/99	ML-029 P	Personal (Andy Moore – Ramp Attendant)	1218	0.00062 (e)
9/8/99	ML-030 P1	Personal (Chuck Riley – Operator)	480	0.00077 (e)
9/8/99	ML-030 P2	Personal (Andy Moore – Ramp Attendant)	1236	BDL
9/9/99	ML-031 P1	Personal (Chuck Riley – Operator)	360	BDL
9/9/99	ML-031 P2	Personal (Andy Moore – Ramp Attendant)	1121	BDL
9/10/99	ML-032 P1	Personal (Chuck Riley – Operator)	480	0.00065 (e)
9/10/99	ML-032 P2	Personal (Andy Moore – Ramp Attendant)	1172	BDL
9/11/99	ML-033 P1	Personal (Chuck Riley – Operator)	240	BDL
9/11/99	ML-033 P2	Personal (Andy Moore – Ramp Attendant)	904.8	BDL
9/13/99	ML-034 P1	Personal (Chuck Riley – Operator)	240 (2)	BDL
9/13/99	ML-034 P2	Personal (Andy Moore – Ramp Attendant)	264.5	BDL
9/14/99	ML-035 P1	Personal (Chuck Riley – Operator)	360	0.064 (e)
9/14/99	ML-035 P2	Personal (Andy Moore – Ramp Attendant)	1138	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
9/15/99	ML-036 P1	Personal (Chuck Riley – Operator)	360	0.00034 (e)
9/15/99	ML-036 P2	Personal (Andy Moore – Ramp Attendant)	1203	0.00046 (e)
9/16/99	ML-037	Personal (Andy Moore – Ramp Attendant)	1179	0.00017 (e)
9/17/99	ML-038 P1	Personal (Chuck Riley – Operator)	720	BDL
9/17/99	ML-038 P2	Personal (Andy Moore – Ramp Attendant)	1147	BDL
9/18/99	ML-039 P1	Personal (Chuck Riley – Operator)	480	BDL
9/18/99	ML-039 P2	Personal (Andy Moore – Ramp Attendant)	953.8	BDL
9/20/99	ML-040 P1	Personal (Chuck Riley – Operator)	360	BDL
9/20/99	ML-040 P2	Personal (Andy Moore – Ramp Attendant)	355.3	BDL
9/21/99	ML-041 P1	Personal (Chuck Riley – Operator)	480	BDL
9/21/99	ML-041 P2	Personal (Andy Moore – Ramp Attendant)	1150	BDL
9/22/99	ML-042 P1	Personal (Chuck Riley – Operator)	480	BDL
9/22/99	ML-042 P2	Personal (Andy Moore – Ramp Attendant)	1200	BDL
9/23/99	ML-043 P1	Personal (Chuck Riley – Operator)	480	BDL
9/23/99	ML-043 P2	Personal (Andy Moore – Ramp Attendant)	1248	BDL
9/24/99	ML-044 P1	Personal (Chuck Riley – Operator)	360	BDL
9/24/99	ML-044 P2	Personal (Andy Moore – Ramp Attendant)	884	BDL
9/25/99	ML-045 P1	Personal (Chuck Riley – Operator)	480	BDL
9/25/99	ML-045 P2 (Broken)	Personal (Andy Moore – Ramp Attendant)	930	VOID(1)
9/27/99	ML-046 P1	Personal (Chuck Riley – Operator)	360	BDL
9/27/99	ML-046 P2	Personal (Andy Moore – Ramp Attendant)	1128	BDL
9/28/99	ML-047 P1	Personal (Chuck Riley – Operator)	360	BDL
9/28/99	ML-047 P2	Personal (Andy Moore – Ramp Attendant)	1182	BDL
9/29/99	ML-048 P1	Personal (Chuck Riley – Operator)	120 (2)	BDL
9/29/99	ML-048 P2	Personal (Andy Moore – Ramp Attendant)	72.7	BDL
10/1/99	ML-049 P1	Personal (Chuck Riley – Operator)	480 (2)	BDL
10/1/99	ML-049 P2	Personal (Andy Moore – Ramp Attendant)	1074	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m³)
10/2/99	ML-050 P1	Personal (Chuck Riley – Operator)	600 (2)	BDL
10/2/99	ML-050 P2	Personal (Andy Moore – Ramp Attendant)	848	BDL
10/4/99	ML-051 P1	Personal (Chuck Riley – Operator)	360	BDL
10/4/99	ML-051 P2	Personal (Andy Moore – Ramp Attendant)	1181	BDL
10/5/99	ML-052 P1	Personal (Chuck Riley – Operator)	480	BDL
10/5/99	ML-052 P2	Personal (Andy Moore – Ramp Attendant)	1181	BDL
10/6/99	ML-053 P1	Personal (Chuck Riley – Operator)	360	BDL
10/6/99	ML-053 P2	Personal (Andy Moore – Ramp Attendant)	1145	BDL
10/7/99	ML-054 P1	Personal (Chuck Riley – Operator)	600	BDL
10/7/99	ML-054 P2	Personal (Andy Moore – Ramp Attendant)	891	BDL
10/8/99	ML-055 P1	Personal (Chuck Riley – Operator)	640	BDL
10/8/99	ML-055 P2	Personal (Andy Moore – Ramp Attendant)	887	BDL
10/11/99	ML-056 P1	Personal (Chuck Riley – Operator)	120	BDL
10/11/99	ML-056 P2	Personal (Andy Moore – Ramp Attendant)	1058	BDL
10/12/99	ML-057 P1	Personal (Chuck Riley – Operator)	360	BDL
10/12/99	ML-057 P2	Personal (Andy Moore – Ramp Attendant)	1143	BDL
10/13/99	ML-058 P1	Personal (Chuck Riley – Operator)	360	BDL
10/13/99	ML-058 P2	Personal (Andy Moore – Ramp Attendant)	1014	BDL
10/14/99	ML-059 P1	Personal (Chuck Riley – Operator)	480	BDL
10/14/99	ML-059 P2	Personal (Andy Moore – Ramp Attendant)	997	BDL
10/15/99	ML-060 P1	Personal (Chuck Riley – Operator)	360	BDL
10/15/99	ML-060 P2	Personal (Andy Moore – Ramp Attendant)	1001	BDL
10/18/99	ML-061 P1	Personal (Chuck Riley – Operator)	480	BDL
10/18/99	ML-061 P2	Personal (Bob Calveit – Ramp Attendant)	785	BDL
10/19/99	ML-062 P1	Personal (Operator)	480	BDL
10/19/99	ML-062 P2	Personal (Bob Calveit – Ramp Attendant)	915.2	BDL
10/20/99	ML-063 P1	Personal (Chuck Riley – Operator)	600	BDL
10/20/99	ML-063 P2	Personal (Kenny Knapp – Ramp Attendant)	968.4	BDL

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Personal Air Monitoring Data

Date	Sample No.	Sample Description	Sample Volume (liters)	* Results (mg/m^3)
10/21/99	ML-064 P1	Personal (Operator)	480	BDL
10/21/99	ML-064 P2	Personal (Bob Calveit – Ramp Attendant)	825.21	BDL
10/22/99	ML-065 P1	Personal (Scott Moore – Operator)	480	BDL
10/22/99	ML-065 P2	Personal (Bob Calveit – Ramp Attendant)	973	BDL
10/25/99	ML-066 P1	Personal (Chuck Riley – Operator)	360	BDL
10/25/99	ML-066 P2	Personal (Bob Calveit – Ramp Attendant)	830.9	BDL
10/26/99	ML-067 P1	Personal (Chuck Riley – Operator)	360	BDL
10/26/99	ML-067 P2	Personal (Bob Calveit – Ramp Attendant)	974.2	BDL
10/27/99	ML-068 P1	Personal (Chuck Riley – Operator)	480	BDL
10/27/99	ML-068 P2	Personal (Bob Calveit – Ramp Attendant)	571.3	BDL
10/28/99	ML-069 P1	Personal (Chuck Riley – Operator)	516.2	BDL
11/4/99	ML-070 P1	Personal (Scott Moore – Operator)	474.8	BDL
11/6/99	ML-072 P1	Personal (Scott Moore – Operator)	1022	BDL
11/7/99	ML-073 P1	Personal (Scott Moore – Operator)	1201	BDL
11/8/99	ML-074 P1	Personal (Scott Moore – Operator)	1112	BDL
11/9/99	ML-075 P1	Personal (Chuck Riley – Operator)	1182	BDL

* OSHA PEL = 1 mg/m^3

Notes:

(a) Aroclor 1016
(b) Aroclor 1221
(c) Aroclor 1232
(d) Aroclor 1242
(e) Aroclor 1248
(f) Aroclor 1254
(g) Aroclor 1260

Comments:

(1) Void - pump faulted
(2) Flow rate not reported - Volume is assumed.
(3) Elapsed time not reported - Volume is assumed.

SUMMARY OF $TiCl_4$ PLANT PCB WIPE SAMPLE RESULTS

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Wipe Sample Results

Date	Sample No.	Sample Description	Results (μg)
7/28/99	352-99-W001	Trencher - 100 cm^2	BDL
8/2/99	W-2	Red Triaxle - 100 cm^2	BDL
8/2/99	W-3	Trailer-Semi - 100 cm^2	BDL
8/2/99	Blank	Blank - 100 cm^2	BDL
8/4/99	W-5	Roll Off 080 - 100 cm^2	BDL
8/4/99	W-6	Roll Off 088 - 100 cm^2	BDL
8/7/99	W-7	Make/Model Stone Box - 100 cm^2	BDL
8/11/99	W-8	Make/Model Bucket/1-330 - 100 cm^2	BDL
8/11/99	W-9	Make/Model Tractor/I-F, Customer ID # Berner - 100 cm^2	BDL
8/12/99	W-10	2 Foot Bucket Northside - 100 cm^2	BDL
8/12/99	W-11	Hammer - 100 cm^2	BDL
8/22/99	W-12	Foster Trailer 0196 - 100 cm^2	BDL
9/11/99	W-13	Dart Trailer 84T - 100 cm^2	BDL
9/19/99	W-15	Concrete Slab - 100 cm^2	BDL
9/19/99	W-16	Concrete Slab - 100 cm^2	BDL
9/18/99	W-17	Slab Spillage (West) - 100 cm^2	BDL
9/25/99	Concrete Slab East	N 485.3, E 1028.7 - 100 cm^2	BDL
9/25/99	Concrete Slab West	N 476.2, E 1093.6 - 100 cm^2	BDL
10/7/99	W-020	CAT 330 - 100 cm^2	BDL
10/8/99	W-021	Trailer 81T - 100 cm^2	BDL
10/8/99	W-022	Trailer 0339 - 100 cm^2	BDL
10/8/99	W-023	Trailer U868432 - 100 cm^2	BDL
10/11/99	W-024	Trailer 79T - 100 cm^2	BDL
10/11/99	W-025	Trailer 48T - 100 cm^2	BDL
10/11/99	W-026	Trailer 88T - 100 cm^2	BDL
10/12/99	352-99-W027	Dozer Tracks - 100 cm^2	BDL
10/13/99	352-99-W028	Trailer 99T - 100 cm^2	BDL
10/14/99	352-99-W029	Trailer 292 - 100 cm^2	BDL

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Summary of PCB Wipe Sample Results

Date	Sample No.	Sample Description	Results (μg)
10/14/99	352-99-W030	Trailer 284 - 100 cm^2	BDL
10/18/99	352-99-W031	Trailer 123T - 100 cm^2	BDL
10/18/99	352-99-W032	Trailer 37T - 100 cm^2	BDL
10/16/99	352-99-W033	Komatsu 220 Tracks - 100 cm^2	BDL
10/21/99	W-34	Komatsu 300 Tracks - 100 cm^2	BDL
10/26/99	352-99-W035	Loader Bucket - 100 cm^2	BDL
10/26/99	352-99-W036	Hat Excavator - 100 cm^2	BDL
10/28/99	352-99-W041	Trailer 943 - 100 cm^2	BDL
10/28/99	352-99-W042	Trailer 101 - 100 cm^2	BDL
10/29/99	W-47	220 Komatsu Bucket - 100 cm^2	BDL
10/29/99	W-48	Trailer 54 - 100 cm^2	BDL
11/3/99	AL-W-049	Plate #4 - 100 cm^2	BDL

* Detection Limit = 10 μg
TSCA acceptable limit = 10 μg

Notes:

(a) Aroclor 1016
(b) Aroclor 1221
(c) Aroclor 1232
(d) Aroclor 1242
(e) Aroclor 1248
(f) Aroclor 1254
(g) Aroclor 1260

SUMMARY OF LANDFILL PCB WIPE SAMPLE RESULTS

Millennium Inorganic Chemicals
Millennium Ashtabula Landfill
Summary of PCB Wipe Sample Results

Date	Sample No.	Sample Description	Results * (μg)
8/26/99	AL-W-1	D6M-L6P-Dozer - 100cm^2	BDL
8/26/99	AL-Blank-1	Blank	BDL
9/7/99	AL-W-2	Cat 320 B Exc. - 100cm^2	BDL
10/28/99	AL-W-3	Plate #1 - 100cm^2	BDL
10/28/99	AL-W-4	Cat 330 B Exc. - 100cm^2	BDL
10/28/99	AL-W-5	Plate #2 - 100cm^2	BDL
10/28/99	AL-W-6	Plate #3 - 100cm^2	BDL
11/1/99	AL-W-7	Cat Dozer - 100cm^2	BDL
11/3/99	AL-W-049	Plate #4 - 100cm^2	BDL

* Detection Limit = 10 μg
TSCA acceptable limit = 10 μg

Notes:

BDL	Below Detection Limit
(a)	Aroclor 1016
(b)	Aroclor 1221
(c)	Aroclor 1232
(d)	Aroclor 1242
(e)	Aroclor 1248
(f)	Aroclor 1254
(g)	Aroclor 1260

SUMMARY OF RADIOLOGICAL PERIMETER AIR SAMPLING DATA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Radiological Perimeter Air Sample Results

Sample Period	Location	Concentration (µCi/ml)	%P_{CGL} [1),2),3)]
July 27 – Aug 3	MRP #1	4.9E-15	38% P_{CGL}
	MRP #2	3.8E-15	29% P_{CGL}
	MRP #3	3.3E-15	24% P_{CGL}
	MRP #4	<MDC[4)]	<11% P_{CGL} [5)]
	Landfill North	2.5E-15	19% P_{CGL}
	Landfill East	2.8E-15	22% P_{CGL}
	Landfill South	2.4E-15	18% P_{CGL}
	Landfill West	2.8E-15	22% P_{CGL}
Aug 3 – Aug 10	MRP #1	3.6E-15	28% P_{CGL}
	MRP #2	6.0E-15	46% P_{CGL}
	MRP #3	5.5E-15	42% P_{CGL}
	MRP #4	6.1E-15	47% P_{CGL}
	Landfill North	2.5E-15	19% P_{CGL}
	Landfill East	3.3E-15	25% P_{CGL}
	Landfill South	3.0E-15	23% P_{CGL}
	Landfill West	8.7E-15	67% P_{CGL}
Aug 10 – Aug 17	MRP #1	6.4E-15	49% P_{CGL}
	MRP #2	4.9E-15	37% P_{CGL}
	MRP #3	2.0E-15	16% P_{CGL}
	MRP #4	<MDC[4)]	<10% P_{CGL} [5)]
	Landfill North	1.7E-15	13% P_{CGL}
	Landfill East	2.5E-15	19% P_{CGL}
	Landfill South	3.6E-15	28% P_{CGL}
	Landfill West	8.7E-15	67% P_{CGL}
Aug 17 – Aug 24	MRP #1	5.4E-15	41% P_{CGL}
	MRP #2	<MDC[4)]	<15% P_{CGL} [5)]
	MRP #3	3.3E-15	26% P_{CGL}
	MRP #4	<1.9E-15	15% P_{CGL}
	Landfill North	<MDC[4)]	<11% P_{CGL} [5)]
	Landfill East	<MDC[4)]	<15% P_{CGL}
	Landfill South	2.6E-15	20% P_{CGL}
	Landfill West	1.3E-14	100% P_{CGL}
Aug 24 – Aug 31	MRP #1	2.4E-15	19% P_{CGL}
	MRP #2	2.0E-15	15% P_{CGL}
	MRP #3	4.3E-15	33% P_{CGL}
	MRP #4	3.0E-15	23% P_{CGL}
	Landfill North	1.5E-15	11% P_{CGL}
	Landfill East	3.2E-15	25% P_{CGL}
	Landfill South	2.6E-15	20% P_{CGL}
	Landfill West	9.2E-15	71% P_{CGL}

1) Perimeter Concentration Guideline Level (P_{CGL}); Permissible Effluent Concentration applicable to the assessment of dose to the public.
2) P_{CGL} for the Millennium MRP Excavation Project is 1.3E-14 µCi/ml (based on radionuclides present in MRP material).
3) Action level for evaluation of public exposure is 100% of P_{CGL}.
4) Minimum Detectable Concentration (MDC); Sensitivity for measured air concentration.
5) Based on MDC for measurement.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Radiological Perimeter Air Sample Results

Sample Period	Location	Concentration (µCi/ml)	$\%P_{CGL}$ [1),2),3)]
Aug 31 – Sep 7	MRP #1	2.9E-15	22% P_{CGL}
	MRP #2	3.4E-15	26% P_{CGL}
	MRP #3	3.7E-15	29% P_{CGL}
	MRP #4	4.7E-15	36% P_{CGL}
	Landfill North	1.1E-15	8% P_{CGL}
	Landfill East	6.1E-15	47% P_{CGL}
	Landfill South	1.4E-15	11% P_{CGL}
	Landfill West	8.1E-15	62 % P_{CGL}
Sep 7 – Sep 14	MRP #1	5.1E-15	39% P_{CGL}
	MRP #2	5.7E-15	44% P_{CGL}
	MRP #3	5.1E-15	39% P_{CGL}
	MRP #4	2.7E-15	21% P_{CGL}
	Landfill North	1.1E-14	12% P_{CGL}
	Landfill East	4.7E-15	36% P_{CGL}
	Landfill South	3.2E-15	25% P_{CGL}
	Landfill West	4.4E-15	34% P_{CGL}
Sep 14 – Sep 21	MRP #1	1.5E-15	14% P_{CGL}
	MRP #2	5.4E-15	42% P_{CGL}
	MRP #3	3.9E-15	30% P_{CGL}
	MRP #4	2.1E-15	16% P_{CGL}
	Landfill North	5.0E-15	38% P_{CGL}
	Landfill East	2.6E-15	20% P_{CGL}
	Landfill South	5.2E-15	40% P_{CGL}
	Landfill West	5.1E-15	39% P_{CGL}
Sep 21 – Sep 28	MRP #1	3.3E-15	25% P_{CGL}
	MRP #2	3.4E-15	26% P_{CGL}
	MRP #3	3.3E-15	25% P_{CGL}
	Landfill North	6.4E-15	49% P_{CGL}
	Landfill East	3.1E-15	24% P_{CGL}
	Landfill South	4.6E-15	36% P_{CGL}
	Landfill West	8.1E-15	51% P_{CGL}
Sep 28 – Oct 5	MRP #1	1.6E-15	12% P_{CGL}
	MRP #2	2.1E-15	16% P_{CGL}
	MRP #3	2.1E-15	16% P_{CGL}
	Landfill North	1.6E-15	13% P_{CGL}
	Landfill East	2.0E-15	15% P_{CGL}
	Landfill South	1.6E-15	13% P_{CGL}
	Landfill West	<MDC[4)]	<12% P_{CGL} [5)]

1) Perimeter Concentration Guideline Level (P_{CGL}); Permissible Effluent Concentration applicable to the assessment of dose to the public.
2) P_{CGL} for the Millennium MRP Excavation Project is 1.3E-14 µCi/ml (based on radionuclides present in MRP material).
3) Action level for evaluation of public exposure is 100% of P_{CGL}.
4) Minimum Detectable Concentration (MDC); Sensitivity for measured air concentration.
5) Based on MDC for measurement.

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Radiological Perimeter Air Sample Results

Sample Period	Location	Concentration (µCi/ml)	%P_{CGL} [1),2),3)]
Oct 5 – Oct 12	MRP #1	3.0E-15	23% P_{CGL}
	MRP #2	4.5E-15	35% P_{CGL}
	MRP #3	1.9E-15	14% P_{CGL}
	Landfill North	<MDC[4)]	<12% P_{CGL}
	Landfill East	<MDC[4)]	<12% P_{CGL} [5)]
	Landfill South	<MDC[4)]	<12% P_{CGL} [5)]
	Landfill West	4.0E-15	31% P_{CGL}
Oct 12 – Oct 19	MRP #1	2.7E-15	21% P_{CGL}
	MRP #2	2.8E-15	22% P_{CGL}
	MRP #3	<MDC[4)]	<12 % P_{CGL} [5]
	Landfill North	<MDC[4)]	<12% P_{CGL} [5)]
	Landfill East	<MDC[4)]	<12% P_{CGL} [5)]
	Landfill South	2.6E-15	20% P_{CGL}
	Landfill West	3.7E-15	29% P_{CGL}
Oct 19 – Oct 26	MRP #1	3.5E-15	27% P_{CGL}
	MRP #2	6.1E-15	47% P_{CGL}
	MRP #3	4.3E-15	33% P_{CGL}
	Landfill North	2.9E-15	23% P_{CGL}
	Landfill East	<MDC[4)]	<8% P_{CGL} [5)]
	Landfill South	2.9E-15	23% P_{CGL}
	Landfill West	3.1E-15	24% P_{CGL}
Oct 26 – Nov 2	Landfill North	3.3E-15	25% P_{CGL}
	Landfill East	2.9E-15	22% P_{CGL}
	Landfill South	6.2E-15	47% P_{CGL}
	Landfill West	2.1E-15	16% P_{CGL}
Nov 2 – Nov 9	Landfill North	7.0E-15	54% P_{CGL}
	Landfill East	2.7E-15	21% P_{CGL}
	Landfill South	3.2E-15	24% P_{CGL}
	Landfill West	2.8E-15	22% P_{CGL}

1) Perimeter Concentration Guideline Level (P_{CGL}); Permissible Effluent Concentration applicable to the assessment of dose to the public.
2) P_{CGL} for the Millennium MRP Excavation Project is 1.3E-14 µCi/ml (based on radionuclides present in MRP material).
3) Action level for evaluation of public exposure is 100% of P_{CGL}.
4) Minimum Detectable Concentration (MDC); Sensitivity for measured air concentration.
5) Based on MDC for measurement.

SUMMARY OF RADIOLOGICAL PERSONAL AIR MONITORING DATA

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Radiological Personnel Air Monitor (PAM) Results

Sample Period	Location	Concentration (µCi/ml)	%DAC[3), 4),5)]
July 27 – July 30	Middle Rd Load Area	<MDC[1)]	<6% DAC[2)]
	Landfill	<MDC[1)]	<4% DAC[2)]
Aug 2 – Aug 7	Middle Rd Load Zone	1.7E-13	9% DAC
	State Rd Load Zone	<MDC[1)]	<9% DAC[2)]
	Landfill	<MDC[1)]	<3% DAC[2)]
Aug 9 – Aug 13	Middle Rd Load Zone	<MDC[1)]	<8% DAC[2)]
	State Rd Loading Area	<MDC[1)]	<4% DAC[2)]
	Landfill	1.3E-13	7% DAC
Aug 16 – Aug 20	Middle Rd Load Zone	<MDC[6)]	<9% DAC[2)]
	State Rd Loading Area	<MDC[1)]	<5% DAC[2)]
	Landfill	<MDC[1)]	<4% DAC[2)]
Aug 23 – Aug 28	Middle Rd Load Zone #1	<MDC[1)]	<12% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	<9% DAC[2)]
	Landfill	<MDC[1)]	<8% DAC[2)]
Aug 30 – Sep 3	Middle Rd Load Zone #1	<MDC[1)]	<11% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	<5% DAC[2)]
	Landfill	<MDC[1)]	<5% DAC[2)]
Sep 7 – Sep 11	Middle Rd Load Zone #1	<MDC[1)]	<5% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	<5% DAC[2)]
	Landfill	<MDC[1)]	<4% DAC[2)]
Sep 13 – Sep 18	Middle Rd Load Zone #1	<MDC[1)]	< 4% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	< 4% DAC[2)]
	MRP Excavator	<MDC[1)]	< 3% DAC[2)]
	Landfill	<MDC[1)]	<4% DAC[2)]
Sep 20 – Sep 25	Middle Rd Load Zone #1	1.6E-13	9% DAC
	Middle Rd Load Zone #2	<MDC[1)]	<5% DAC[2)]
	MRP Excavator	<MDC[1)]	<5% DAC[2)]
	Landfill	<MDC[1)]	<5% DAC[2)]
Sep 27 – Oct 2	Middle Rd Load Zone #1	<MDC[1)]	<9% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	<6% DAC[2)]
	MRP Excavator	<MDC[1)]	<7% DAC[2)]
	Landfill	<MDC[1)]	<9% DAC[2)]
Oct 4 – Oct 8	Middle Rd Load Zone #1	<MDC[1)]	<7% DAC[2)]
	Middle Rd Load Zone #2	<MDC[1)]	<8% DAC[2)]
	MRP Excavator	<MDC[1)]	<4% DAC[2)]
	Landfill	<MDC[1)]	<5% DAC[2)]
Oct 11 - Oct 15	Middle Rd Load Zone #1	<MDC[1)]	<7% DAC[2)]
	MRP Excavator	<MDC[1)]	<4% DAC[2)]
	Landfill	<MDC[1)]	<5% DAC[2)]
Oct 18 - Oct 22	Middle Rd Load Zone #1	<MDC[1)]	<8% DAC[2)]
	MRP Excavator	<MDC[1)]	<7% DAC[2)]
	Landfill	<MDC[1)]	<9% DAC[2)]

1) Minimum Detectable Concentration (MDC); Sensitivity for measured air concentration.
2) Based on MDC for measurement.
3) Derived Air Concentration (DAC); Concentration of radionuclides in air which if breathed for 2,000 hrs/year would result in the Annual Limit on Intake (ALI).
) DAC for the Millennium MRP Excavation Project is 1.8E-12 µCi/ml (based on radionuclides present in MRP material).
5) Action level for monitoring worker intake is 10% of the DAC.
6) Based on radioisotopic (alpha spectroscopy) analysis.

SUMMARY OF TLD RESULTS

Millennium Inorganic Chemicals
Plant 2, $TiCl_4$ Facility
Remedial Action
TLD Results

Name	Job Title	Dose (mr)*
Arnett, S.D.	MRP Operator	< 10 mr
Anderson B.	Truck Driver	< 10 mr
Angstrom C.	Truck Driver	< 10 mr
Arnett, B.	Truck Driver	< 10 mr
Barnes L.	Truck Driver	< 10 mr
Behnke T.	Truck Driver	< 10 mr
Blakeslee T.	Rad Safety Tech	< 10 mr
Bojadzic V.	MRP Laborer	< 10 mr
Brillinger A.	QA Engineer	< 10 mr
Bryan J.	Truck Driver	< 10 mr
Cole H.	Landfill Operator	< 10 mr
Cole M.	MRP Laborer	< 10 mr
Covert R.	Landfill Laborer	< 10 mr
Eaton D.	Rad Safety Tech	< 10 mr
Elliott W.	Truck Driver	< 10 mr
Fryer M.	MRP Laborer	< 10 mr
Helmer S.	ODH Regulatory Oversight	< 10 mr
Higley T.	Truck Driver	< 10 mr
Hocevar B.	Health & Safety Officer	< 10 mr
Horton W.	Rad Safety Tech	< 10 mr
Hughes R.	Environmental Supervisor	< 10 mr
Jenkins D	Rad Safety Tech	< 10 mr
Kendera A.	MRP Laborer	< 10 mr
Kinser R.	Truck Driver	< 10 mr
Knapp K.	Landfill Laborer	< 10 mr
Kowallec P.	Landfill Manager	< 10 mr
Kyser J.	QA Manager	< 10 mr
Land E.	MRP Laborer	< 10 mr
Leuenberger R.	Rad Engineer	< 10 mr
Lewis J.	Rad Safety Tech	< 10 mr
Marks G.	Superintendent	< 10 mr
Mayfield B.	Truck Driver	< 10 mr
McCracken S.	Truck Driver	< 10 mr
Meyer J.	MRP Operator	< 10 mr
Mix C.	Rad Safety Tech	< 10 mr

* Lower Limit of Detection for TLD badge is 10 mr.
ODH - Ohio Department of Health
USACE - United States Army Corps of Engineers

Millennium Inorganic Chemicals
Plant 2, $TiCl_4$ Facility
Remedial Action
TLD Results

Name	Job Title	Dose (mr)*
Moore A.	Landfill Laborer	10 mr
Moore S.	Landfill Operator	< 10 mr
Nelson K.	Landfill Supervisor	< 10 mr
Parker R.	Truck Driver	< 10 mr
Pryer M.	Truck Driver	< 10 mr
Rausch D.	Surveyor	< 10 mr
Reynolds A.	MRP Laborer	< 10 mr
Reynolds E.	MRP Laborer	< 10 mr
Riley C.	Landfill Operator	< 10 mr
Rooney D.	Construction Manager	< 10 mr
Ruffo F.	Mechanic	< 10 mr
Rumberger J.	Truck Driver	< 10 mr
Salcido A.	Truck Driver	< 10 mr
Sauer C.	Truck Driver	< 10 mr
Sharp C.	Survey Manager	< 10 mr
Shears M.	Truck Driver	< 10 mr
Shehabi J.	Project Manager	< 10 mr
Smith J.	Truck Driver	< 10 mr
Smyrak J.	MRP Operator	< 10 mr
Starcher, R.	Truck Driver	< 10 mr
Stewart D.	MRP Laborer	< 10 mr
Stuart L.	Truck Driver	< 10 mr
Tschop F.	USACE Regulatory Oversight	< 10 mr
Walton B.	Truck Driver	< 10 mr
Weaver C.	Truck Driver	< 10 mr
Wick P.	Truck Driver	< 10 mr
Wolosonovich M.	MRP Operator	< 10 mr
Yee K.	MRP Laborer	< 10 mr
Zaverl R.	Foreman	< 10 mr

* Lower Limit of Detection for TLD badge is 10 mr.
ODH - Ohio Department of Health
USACE - United States Army Corps of Engineers

SUMMARY OF RADON-THORON MONITORING

Summary Report
for
MRP Remediation Project Radon Measurements

Permissible Radon Exposures

10CFR 20, Appendix B, Table 1

Rn-222 (Radon) with daughters present

DAC = 30 pCi/l or Annual Limit on Intake = 4 WLM

Rn-220 (Thoron) with daughters present

DAC = 9 pCi/l or Annual Limit on Intake = 12 WLM

Effective Radon DAC

Equilibrium Factor

The DAC or Working Level is based on Radon in equilibrium with radon daughters (progeny). The actual concentration of radon progeny is less than 50% of the radon concentration. Because the majority of the lung dose from Radon originates from the radon progeny, it is widely accepted to assume an Equilibrium Factor of 50% (typically equilibrium factors are less than 50%).

Effective Radon DAC (adjusted for Equilibrium Factor)

The Effective Radon DAC is derived by dividing the DAC by the Equilibrium Factor (50% is a conservative estimate of the Equilibrium Factor).

Rn-222 (Radon) Effective DAC (DAC_{Rn-222})

DAC = 30 pCi/l ÷ 0.5 = 60 pCi/l

Rn-220 (Thoron) Effective DAC (DAC_{Rn-220})

DAC = 9 pCi/l ÷ 0.5 = 18 pCi/l

Maximum Radon Exposures for MRP Workers (based on measurements as of 9/21/99)

Rn-222 (Radon)

All measurements for the MRP Excavation Site and the Landfill are less than 4 pCi/l (i.e., average reading of 1.1 pCi/l). The EPA considers 4 pCi/l to be a safe level for in the home; additionally, 1.1 pCi/l is insignificant compared to the $DAC_{Rn\text{-}222}$ (i.e., 1.1 pCi/l < 10% of 60 pCi/l).

Rn-220 (Thoron)

The average for Thoron measurements at the Landfill is 4.4 pCi/l, or 0.24 Working Levels (i.e., 4.4 pCi/l ÷ 18 pCi/l/WL).

A maximum exposed Landfill worker (based on measurements to date) for the MRP Remediation project may receive:

$$\frac{0.24 \text{ WL} \cdot 700 \text{ hrs}}{170 \text{ WL} \cdot \text{hrs/WLM}} = 1.0 \text{ WLM}$$

Where:

700 hrs = Maximum exposure time for MRP Remediation Worker, based on 12 wks • 50 hrs/wk.

170 WL•hrs/WLM = Conversion factor for calculation of Working Level Month (WLM)

Permissible worker exposure (Allowable Level on Intake) for Thoron is 12 WLM/yr. The maximum exposed worker for the MRP project (based on conservative estimates and measurements to date) is 1 WLM. This estimated maximum worker exposure is insignificant (i.e., <10%) compared to permissible exposure levels (i.e. ALI = 12 WLM).

Summary
Radon Measurements
for
MRP Remediation Project
(9/21/99)

Site	Radon Location	(Rn-222) Week 1	Week 2	Week 3	Thoron (Rn-220) Week 1	Week 2	Week 3
MRP	South	0.6	0.8	0.3	2.6	1.2	1.4
	North	1.1	1.1	0.8	1.3	4.1	0
	Excavator	0.4	1.1	0.2	*35.4	0.9	1.4
	Excavator	0.7	1.3	0.5	4.1	3.5	3.5
	Average =	0.7			Average=	2.2	
	STD=	0.4			STD=	1.4	

Site	Radon Location	(Rn-222) Week 1	Week 2	Week 3	Thoron (Rn-220) Week 1	Week 2	Week 3
Landfill	South	1.3	1.4	**14.7	7.7	5.1	*-39
	North	2.7	2.5	1.8	*14.4	5.4	6.3
	Excavator	0	0.3	0	3.1	0.9	0.9
	Average =	1.3			Average =	4.2	
	STD=	1.1			STD=	2.6	

Radon Summary of Both Sites

Average =	0.9
STD =	0.7
95% CL =	2.2

** 14.7 is an outlier based on 95% CL

Thoron Summary of Both Sites

Average=	3.0
STD=	2.2
*95% CL=	6.5

*35.4, 14.4 & 39 are outliers based on 95% CL

SUMMARY OF BIOASSAY RESULTS

Millennium Inorganic Chemicals
Plant 2 $TiCl_4$ Facility
Remedial Action
Baseline Bioassay Sample Results

Name	Ra-228 (uCi/l)	Ra-228 (uCi/l)	Total Th (uCi/l)
Arnett S.	**3.2E-06**	< 1.0E-06	2.8E-07
Blakeslee T.	**< 3.0E-07**	< 1.0E-06	1.9E-06
Bojadzic V.	**3.0E-07**	1.0E-06	1.6E-06
Cole M.	**3.5E-07**	< 1.0E-06	2.8E-06
Cole H.	**< 3.0E-07**	< 1.0E-06	3.4E-07
Covert R.	**< 3.0E-07**	< 1.0E-06	7.2E-07
Hocevar W.	**< 4.0E-07**	< 1.0E-06	2.9E-06
Jenkins D.	**9.9E-07**	< 1.0E-06	1.1E-06
Kendera A.	**< 3.0E-07**	< 1.0E-06	1.3E-06
Kowallec P.	**5.0E-07**	< 1.0E-06	< 7.0E-07
Lewis J.	**1.5E-06**	< 1.0E-06	< 5.0E-07
Marks G.	**4.8E-07**	< 2.0E-06	< 1.0E-06
Meyer J.	**< 4.0E-07**	< 1.0E-06	2.1E-06
Moore A.	**< 5.0E-07**	< 2.0E-06	< 9.0E-07
Moore S.	**4.5E-07**	< 2.0E-06	< 9.0E-07
Rausch D.	**1.3E-06**	< 1.0E-06	9.5E-07
Reynolds	**< 4.0E-07**	< 1.0E-06	1.8E-06
Riley C.	**< 3.0E-07**	< 1.0E-06	1.1E-06
Simmons L.	**< 4.0E-07**	< 1.0E-06	< 6.0E-07
Smyrak J.	**1.2E-06**	< 1.0E-06	< 3.0E-07
Schmitz W.	**< 4.0E-07**	< 1.0E-06	1.2E-06
Yee K.	**2.8E-06**	< 2.0E-06	2.9E-06
Zaverl R.	**< 4.0E-07**	< 1.0E-06	1.4E-06
Stewart	**1.2E-06**	< 1.0E-06	< 1.0E-06
Land E.	**< 4.0E-07**	< 1.0E-06	2.9E-07
Reynolds	**4.4E-07**	< 1.0E-06	3.0E-07
Knapp K.	**< 4.0E-07**	< 1.0E-06	< 8.0E-07
Fryer M.	**< 3.0E-07**	< 1.0E-06	4.6E-07
Leuenberger R	**1.2E-06**	< 1.0E-06	4.7E-07
Eaton D.	**5.1E-07**	< 2.0E-06	1.1E-06
Horton W.	**1.6E-06**	< 2.0E-06	3.1E-06
Mix C.	**9.2E-06**	< 1.0E-06	1.7E-06
Nelson K.	**< 4.0E-07**	< 1.0E-06	< 2.0E-06
Wolosonovich M.	**< 4.0E-07**	< 1.0E-06	< 6.0E-07

Average =	**9.9E-07**	1.2E-06	1.2E-06
Stan. Deviation =	**1.6E-06**	3.9E-07	8.2E-07
Max =	**9.2E-06**	2.0E-06	3.1E-06

Less than values (<) are below the limit of detection. For measurements below the detection limit, the detection limit is used to calculate the mean and standard deviation.

Millennium Inorganic Chemicals
Plant 2 TiCl Facility
Remedial Action
End of Job Bioassay Sample Results

Name	Ra-226 (uCi/l)	Ra-228 (uCi/l)	Total Th (uCi/l)
Blakeslee T.	< 6.0E-07	< 1.0E-06	6.0E-07
Bojadzic V.	< 7.0E-07	< 1.0E-06	2.6E-07
Cole H.	1.0E-06	< 2.0E-06	1.1E-06
Cole M.	< 6.0E-07	< 1.0E-06	9.8E-07
Covert R.	< 6.0E-07	< 2.0E-06	3.0E-07
Eaton D.	< 5.0E-07	< 1.0E-06	8.7E-07
Fryer M.	< 7.0E-06	< 1.0E-06	6.9E-07
Hocevar W.	< 5.0E-07	< 1.0E-06	3.5E-07
Horton W.	5.2E-07	< 1.0E-06	< 9.0E-07
Jenkins D.	< 4.0E-07	< 1.0E-06	2.4E-07
Kendera A.	< 4.0E-07	< 1,0E-06	< 5.0E-07
Knapp K.	< 4.0E-07	< 1.0E-06	5.1E-07
Kowallec P.	1.2E-06	< 1.0E-06	5.5E-07
Leuenberger R	< 4.0E-07	< 1.0E-06	3.3E-07
Lewis J.	< 3.0E-07	< 1.0E-06	< 5.0E-07
Marks G.	5.2E-07	< 1.0E-06	3.0E-07
Meyer J.	< 4.0E-07	< 1.0E-06	2.0E-06
Mix C.	6.6E-07	< 2.0E-06	< 7.0E-07
Moore A.	< 6.0E-07	< 1.0E-06	2.5E-07
Moore S.	< 5.0E-07	< 1.0E-06	5.7E-07
Nelson K.	< 6.0E-07	< 1.0E-06	< 4.0E-07
Rausch D.	< 6.0E-07	< 1.0E-06	2.5E-06
Reynolds A.	< 4.0E-07	< 1.0E-06	< 4.0E-07
Reynolds E.	< 7.0E-07	< 1.0E-06	7.9E-07
Riley C.	6.3E-07	< 1.0E-06	3.3E-07
Smyrak J.	5.6E-07	< 2.0E-06	5.0E-07
Stewart	< 5.0E-07	< 1.0E-06	2.4E-07
Wolosonovich M.	< 6.0E-07	< 1.0E-06	5.3E-07
Yee K.	4.8E-07	< 2.0E-06	5.4E-07
Zaverl R.	4.1E-07	< 1.0E-06	< 6.8E-07

Average =	6.6E-07
UCL =	1.4E-05
Max =	1.2E-06

Average =	6.7E-07
UCL =	6.7E-06
Max =	2.5E-06

Less than values (<) are below detection limit (DL).
For measurements <DL, results are not used to calculate mean and standard deviation.
UCL based on baseline bioassay samples one tail distribution at 99% confidence level.

APPENDIX G
PHOTOGRAPHS

APPENDIX G
PHOTO LOG

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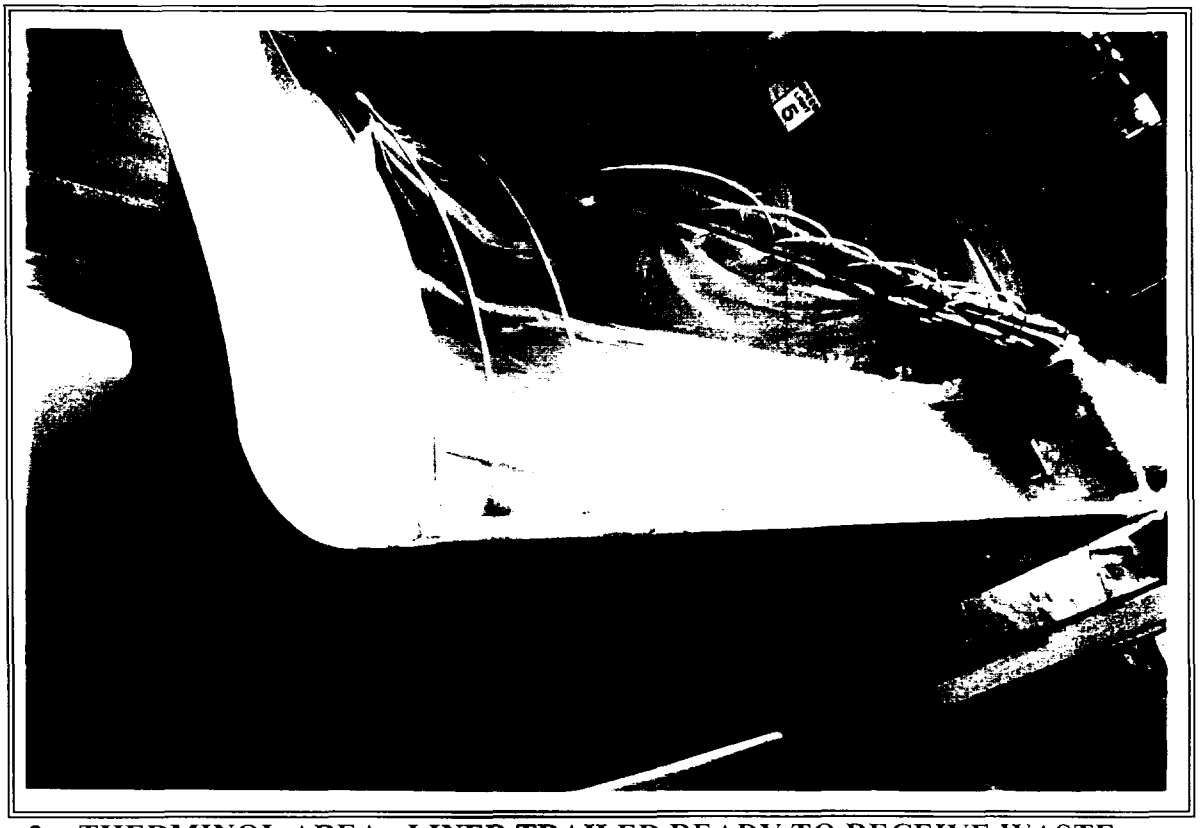
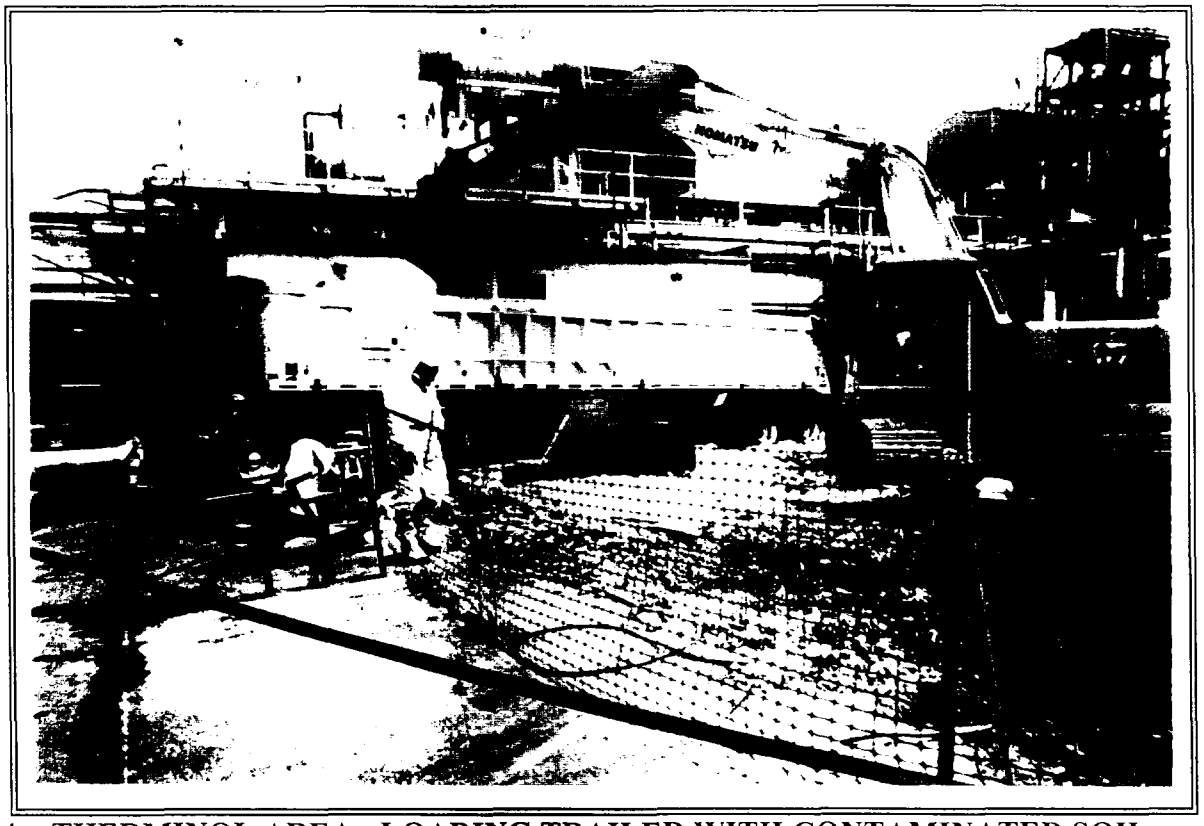
1: THERMINOL AREA - DEMOLISHING CONTAINMENT WALL

2: THERMINOL AREA - TRUCK LOADING PAD

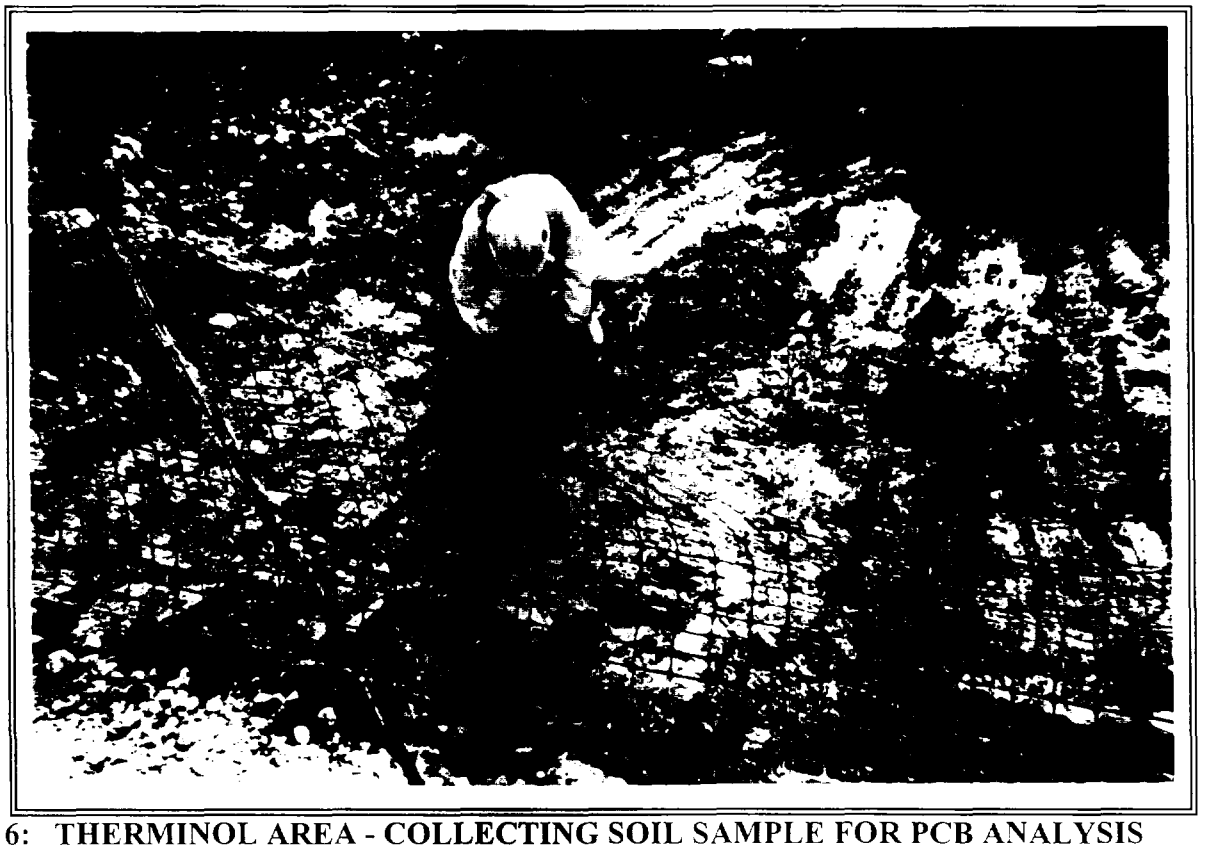


3: THERMINOL AREA - LINED TRAILER READY TO RECEIVE WASTE

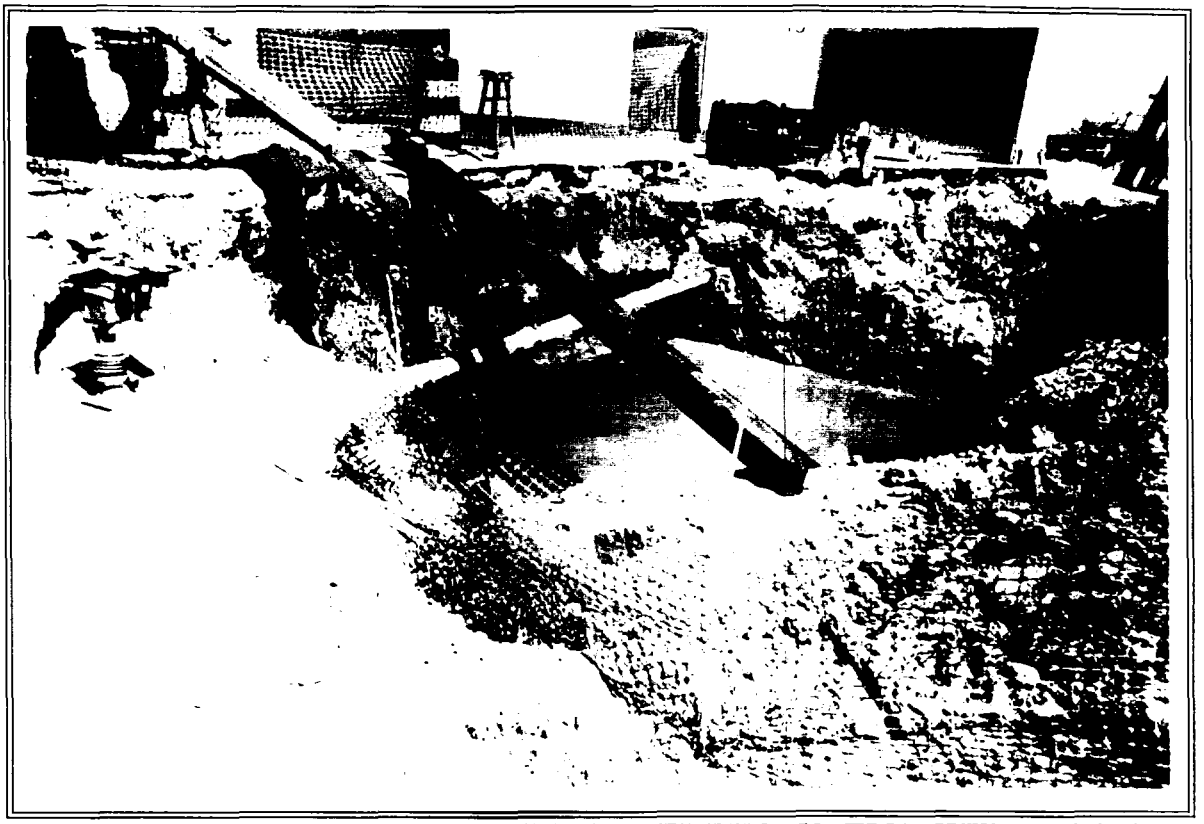


4: THERMINOL AREA - LOADING TRAILER WITH CONTAMINATED SOIL

5: THERMINOL AREA - LOADED TRAILER



6: THERMINOL AREA - COLLECTING SOIL SAMPLE FOR PCB ANALYSIS

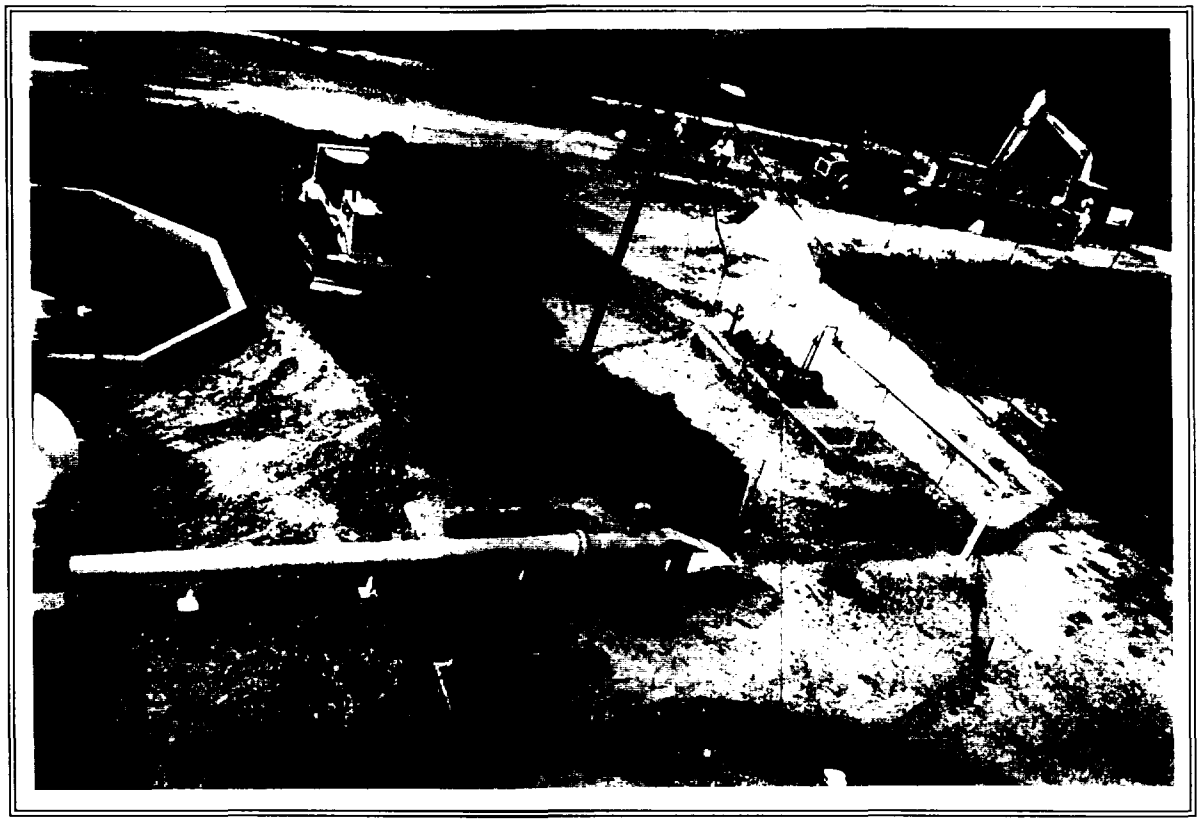


7: THERMINOL AREA - BACKFILLING DEEP EXCAVATION WITH LSM 50

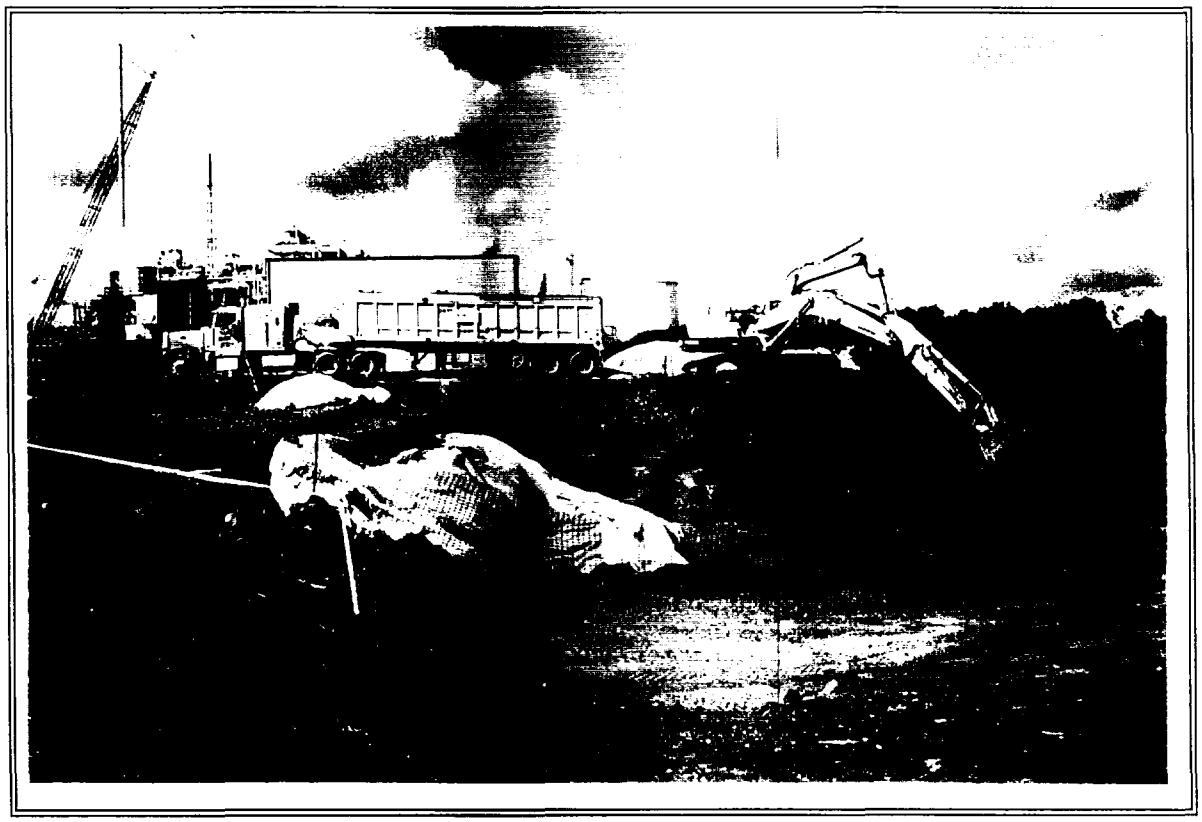
8: THERMINOL AREA - PERSONNEL DECONTAMINATION

9: THERMINOL AREA - EQUIPMENT DECONTAMINATION

10: NORTH TRAFFIC AREA - EXCAVATION, FACING EAST



11: NORTH TRAFFIC AREA - OVERHEAD VIEW OF BACKFILL OPERATIONS

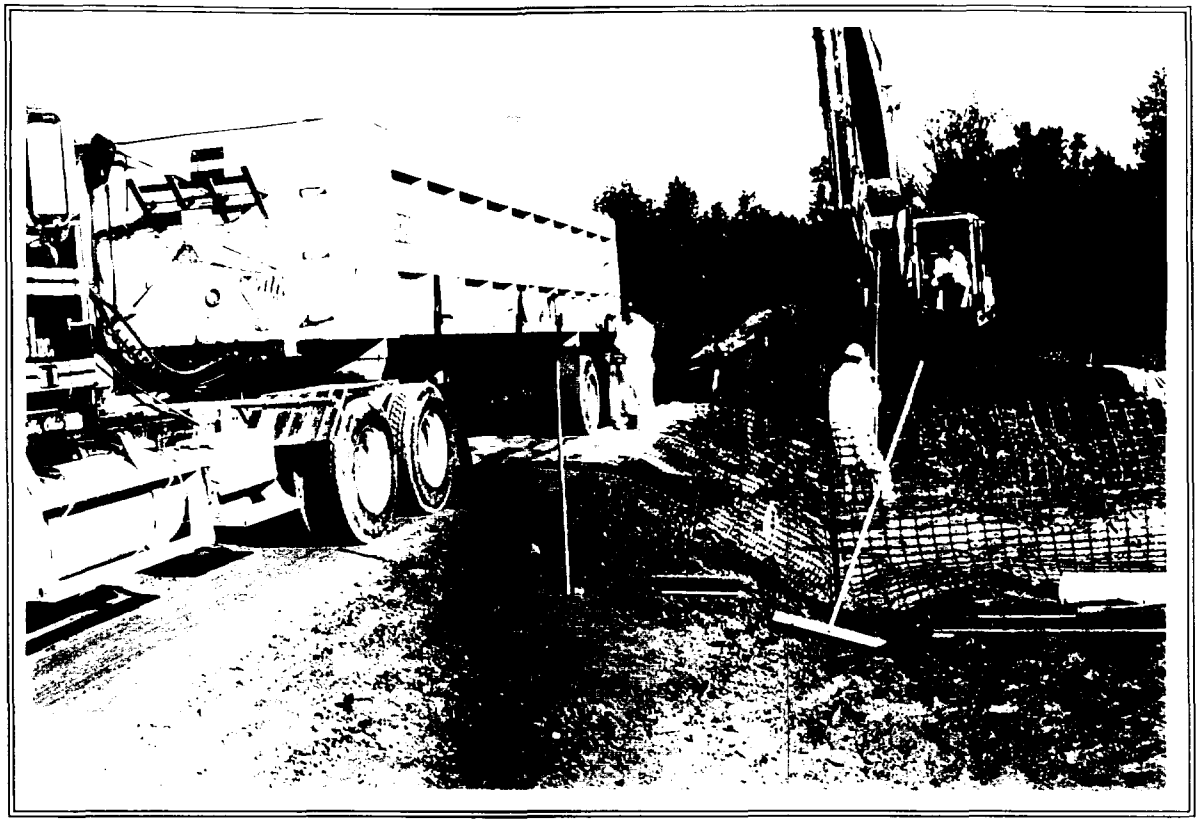


12: MRP - EXCAVATION ALONG NORTH SIDE, FACING WEST

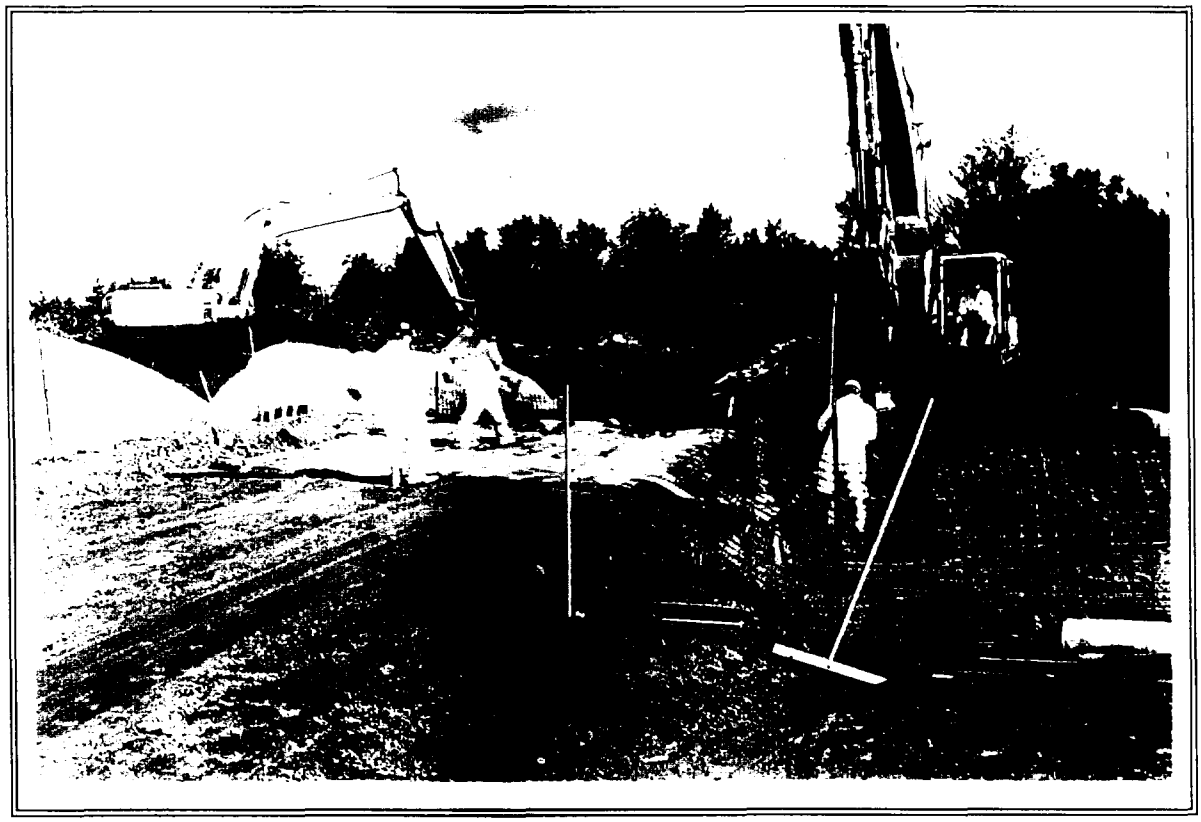
13: MRP - LOADING TRUCK, FACING NORTHWEST

14: MRP - RCT VERIFYING LOADED TRAILER IS BELOW DOT LIMITS FOR RADIOLOGICAL PLACARDING

15: MRP - RCT COLLECTING LAW SAMPLE FROM LOADED TRAILER



16: MRP - RCT ANALYZING LAW SAMPLE FROM LOADED TRAILER

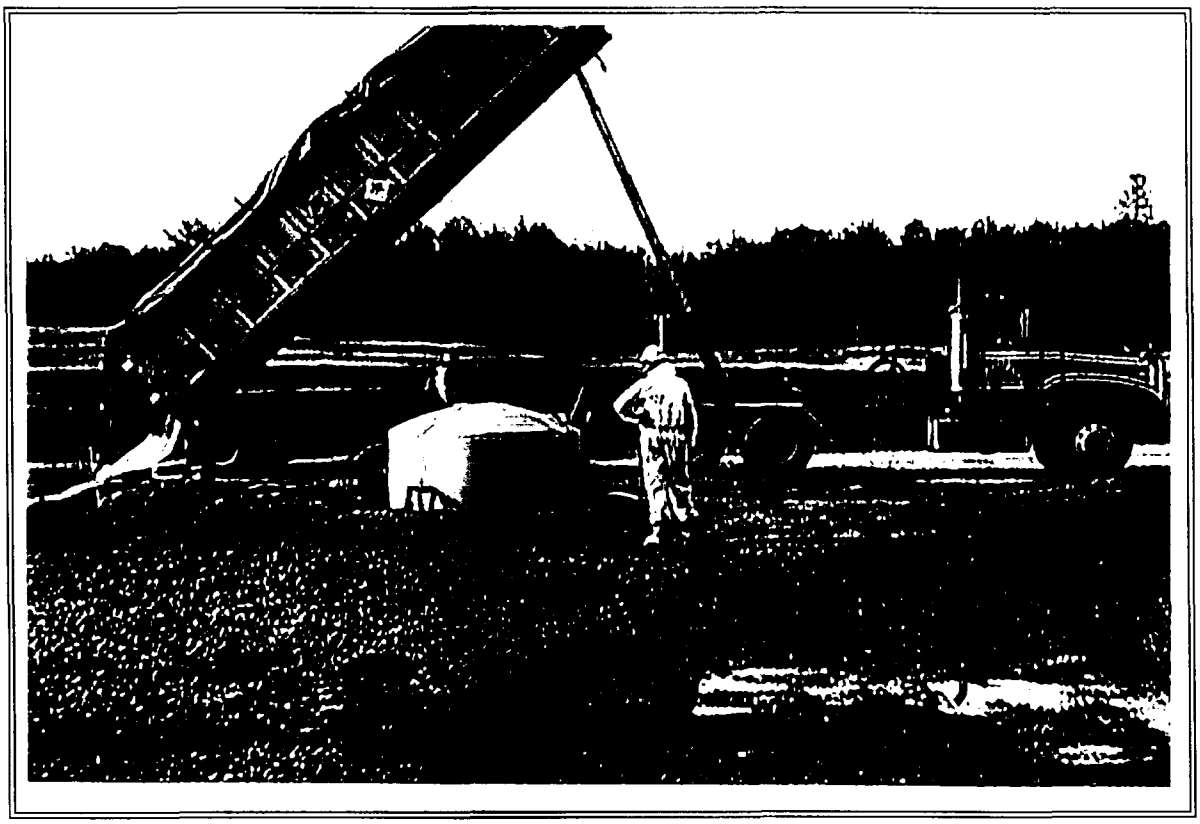


17: MRP - SWEEPING OFF LOADING PAD PRIOR TO NEXT TRUCK

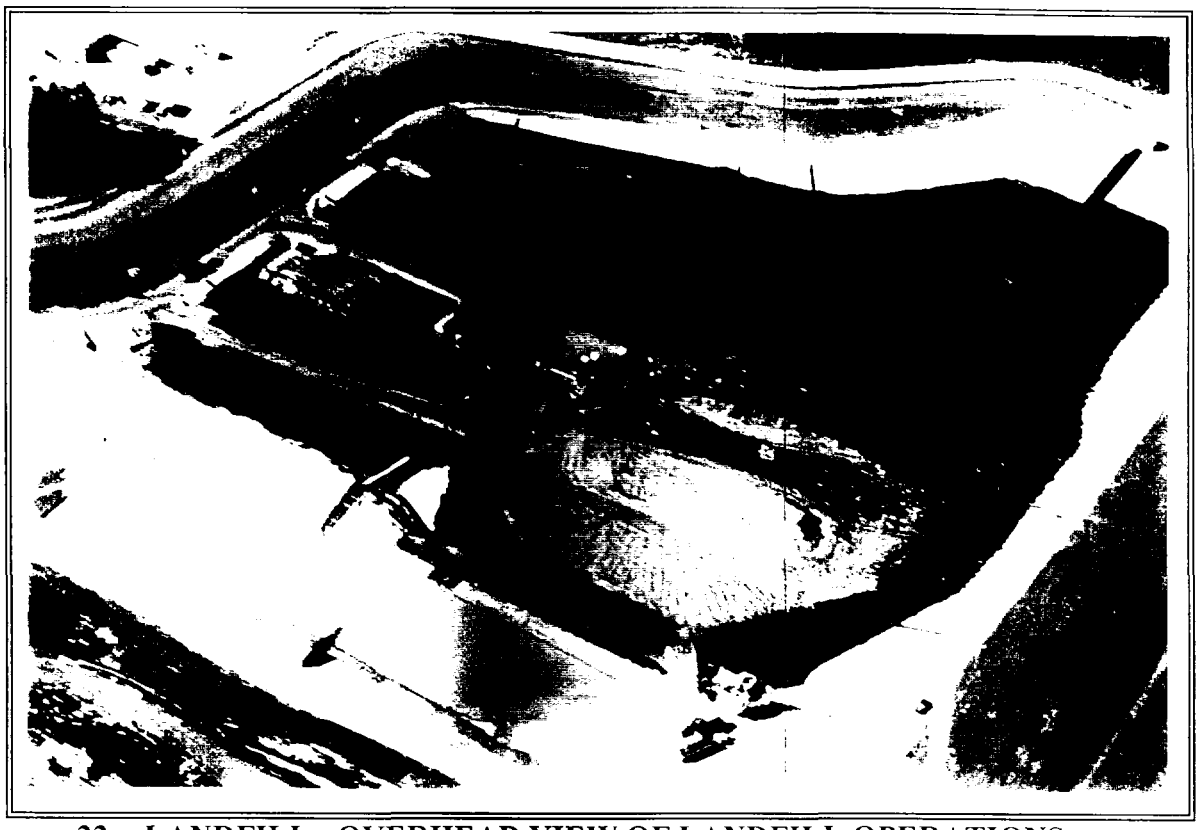
18: MRP - DRIVER RECEIVES MANIFEST WHILE LABORER TARPS TRUCK

19: MRP - OVERHEAD VIEW OF CLEANUP OPERATIONS

20: LANDFILL - TRAILER OFFLOADING PAD



21: LANDFILL - TRAILER DUMPING FROM OFFLOADING PAD



22: LANDFILL - OVERHEAD VIEW OF LANDFILL OPERATIONS

23: MRP - LOADING TRAILER ON CONCRETE PAD, FACING WEST

24: MRP - RCT PERFORMING GAMMA SCAN WALKOVER SURVEY

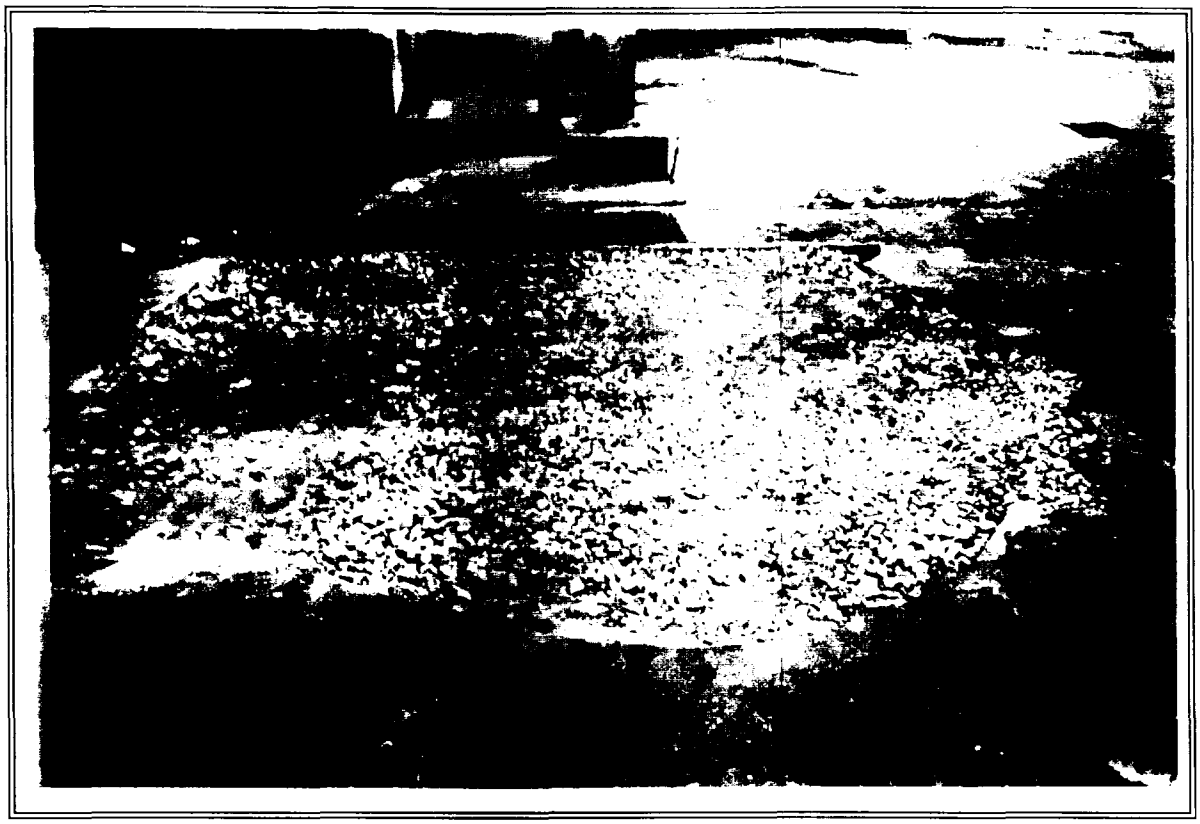
25: MRP - RCT COLLECTING SOIL SAMPLE FOR RADIOLOGICAL ANALYSIS

26: MRP - LABORERS INVESTIGATE SUSPECTED DRUM IN LEVEL B PPE

27: LAYDOWN AREA - REMOVING CONCRETE WITH ELEVATED RADIOLOGICAL READINGS

28: MRP - EXTERIOR VIEW OF DECONTAMINATION PAD

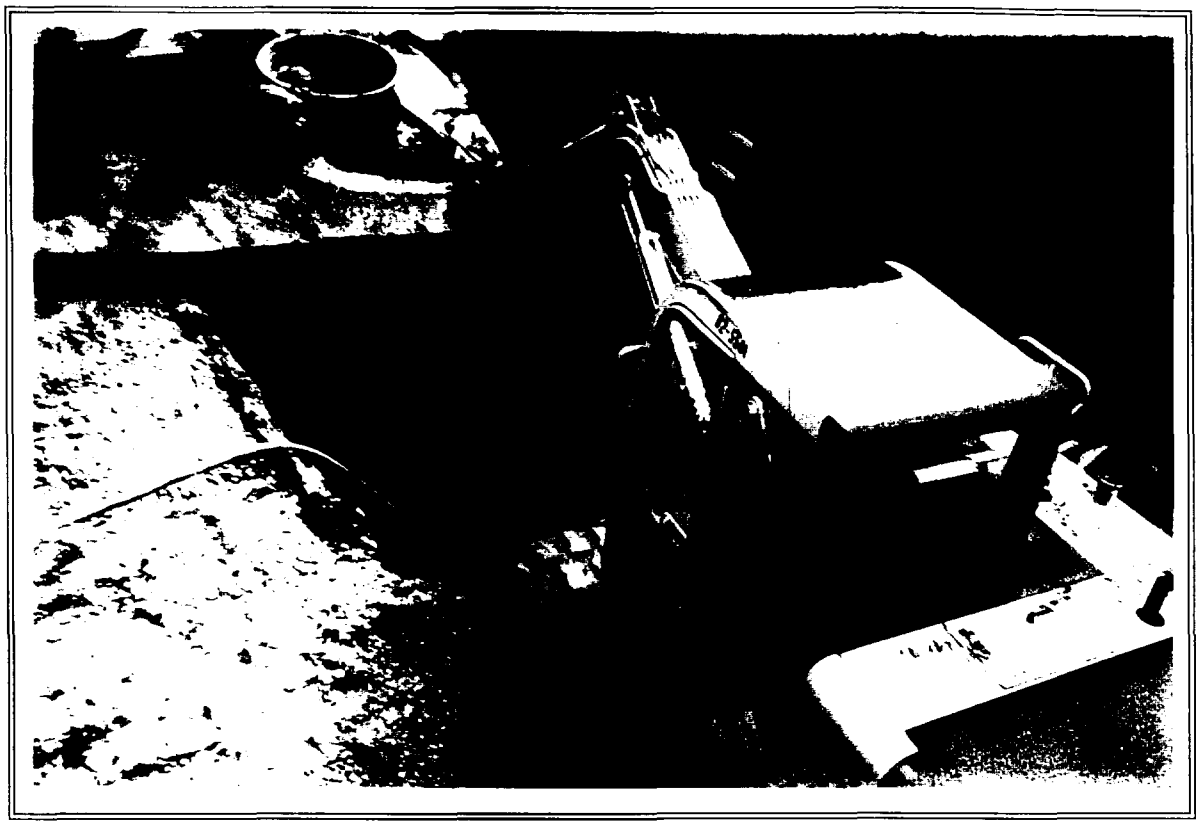
29: PLANT PROCESS AREA - AREA "A" EXCAVATION LIMITS, FACING WEST



30: PLANT PROCESS AREA - BACKFILLED AREA "B", FACING EAST

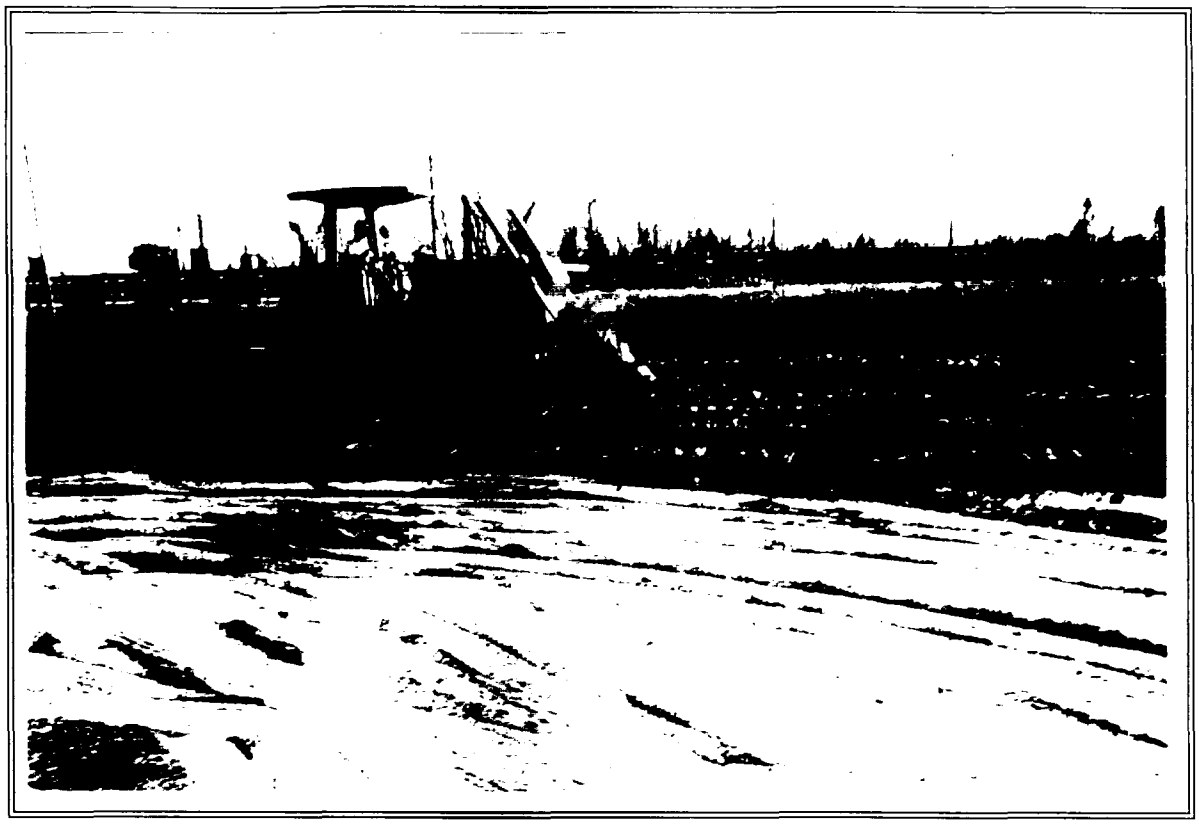
31: PLANT PROCESS AREA - BACKFILLING AREA "C", FACING SOUTHEAST

32: PLANT PROCESS AREA - AREA "D" EXCAVATION LIMITS, FACING EAST

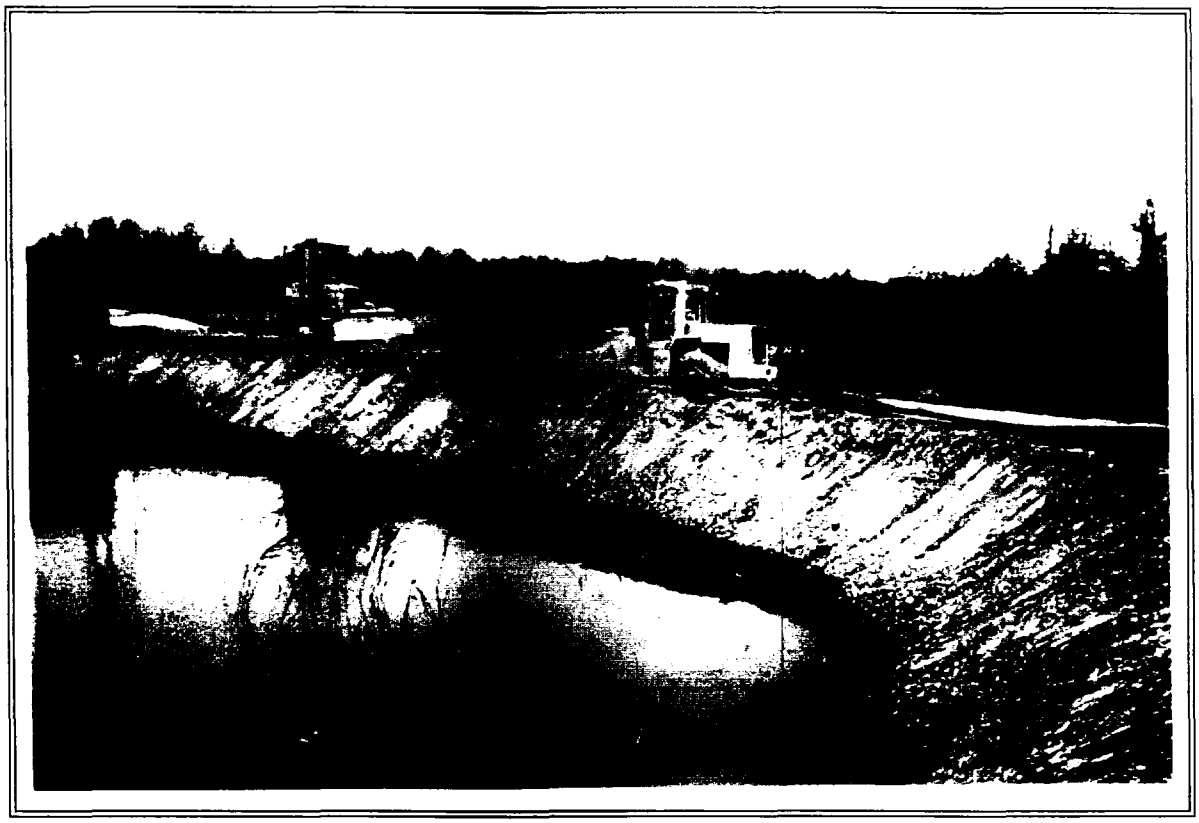


33: PLANT PROCESS AREA - AREA "E" EXCAVATION, FACING EAST

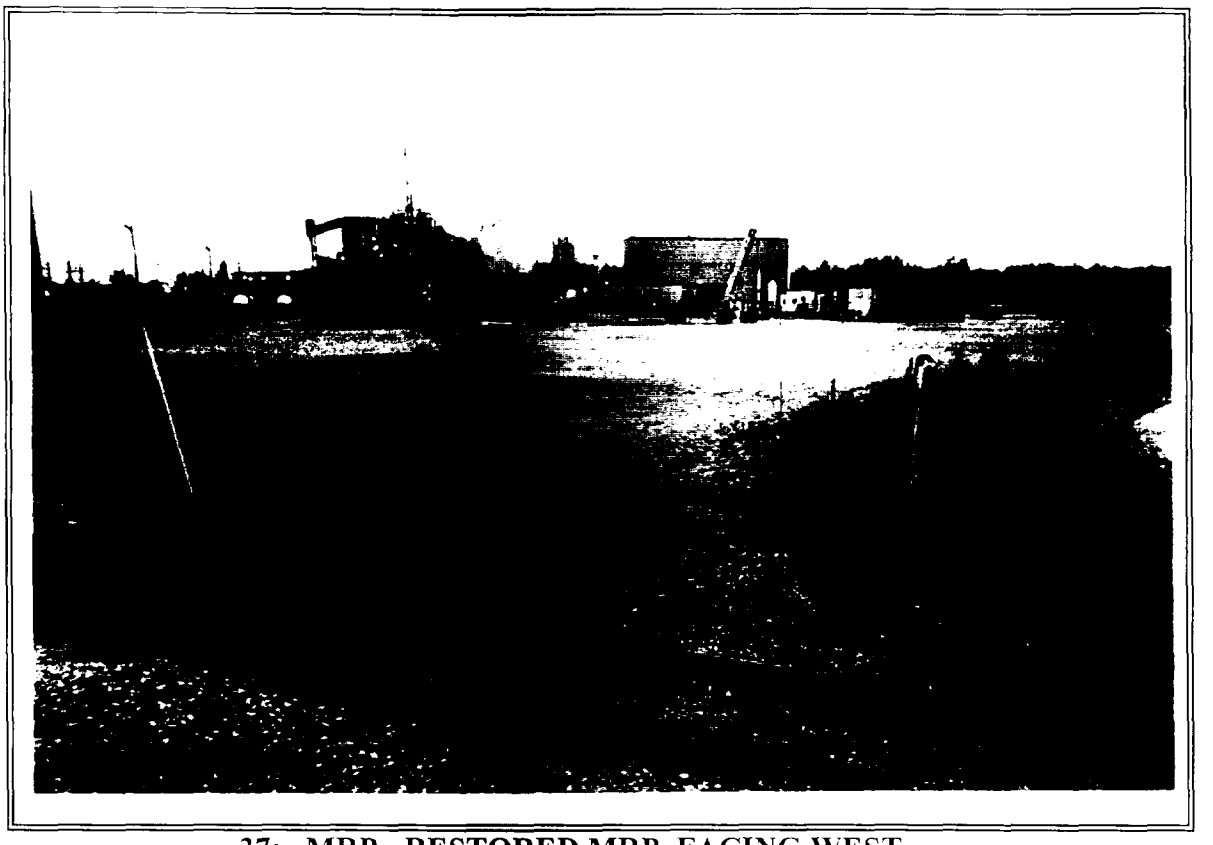
34: LAYDOWN AREA - ASPHALT PAVING



35: MRP - PLACING TOPSOIL



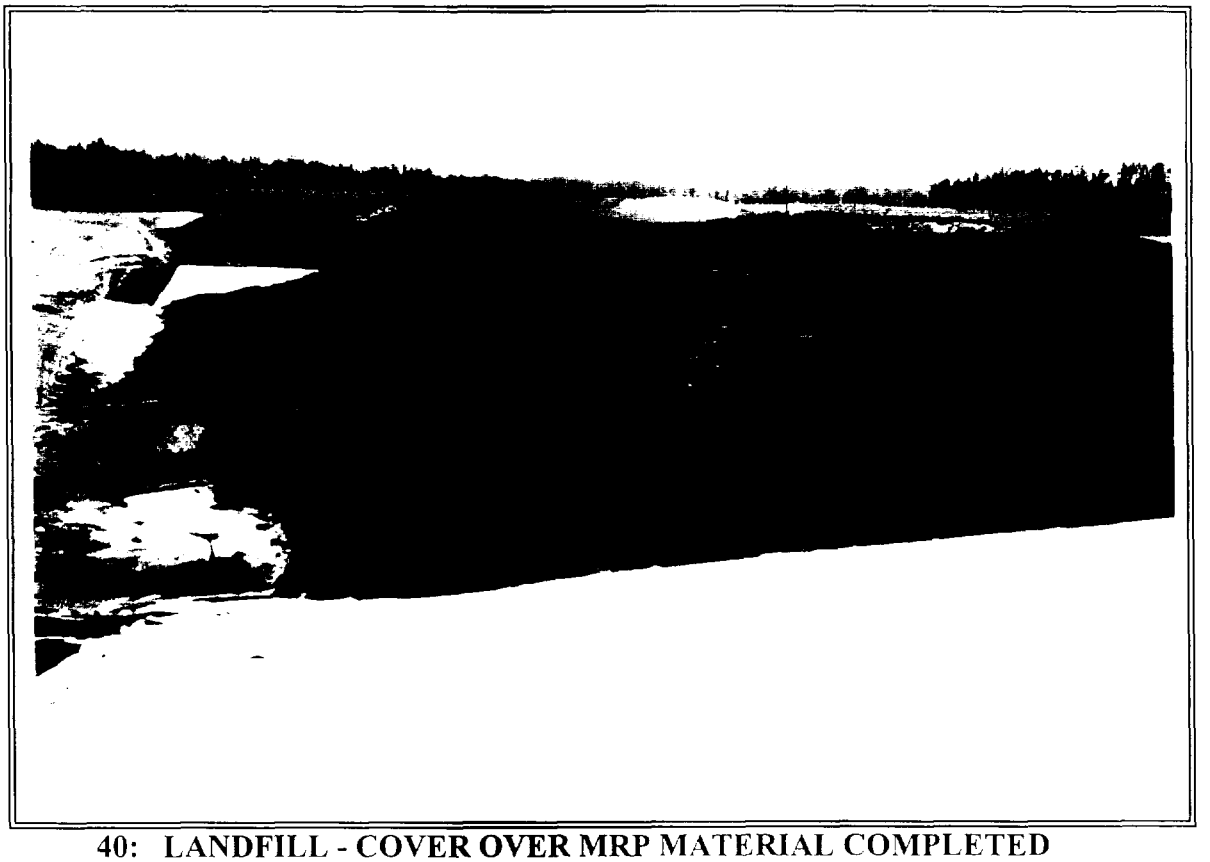
36: NORTH TRAFFIC AREA - INSTALLING NON-EROSIONAL COVER AROUND POND



37: MRP - RESTORED MRP, FACING WEST

38: MRP - RESTORED MRP, FACING NORTHWEST

39: MRP - RESTORED NORTH SLOPE OF MRP, FACING WEST



40: LANDFILL - COVER OVER MRP MATERIAL COMPLETED

APPENDIX H
INTERIM MEASURES LETTER REPORT

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES DIVISION
MK-FERGUSON PLAZA
1500 West 3rd Street
Cleveland, Ohio 44113-1406

Transmittal Letter

Project Name:	Transmittal Number:	Work Order Number:
Fields Brook Superfund Site Millennium Inorganic Chemicals Ashtabula, Ohio	4923-TL-020	4923
	Date: November 12, 1998	

To:

Ms. Terese Van Donsel
Remedial Project Manager
US EPA
SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604

REFERENCES

Name:

Equipment Number:

Purchase Order Number:

Vendor Order Number:

☒ **TRANSMITTED HEREWITH** ☐ **RETURNING FOR STATUS NOTED**

For:
- ☐ Review and comment
- ☐ Approval
- Record
- X Information
- ☐ As requested

Reviewed	A
Review as noted	B
Resubmit	C
For information	D
Other _____	E

Quantity	Item	Title/Description
1	Letter Report for Interim Measures at Millennium Inorganic Chemicals Site	

DISTRIBUTION:

Paul Findlay - MIC
Josef M. Shehabi - MIC
Mark T. McIntyre - MIC
Rick Hughes - MIC
File: 4923-2.021
4923-10.03

By: for

Name: John Singleton

Title: Project Manager

MORRISON KNUDSEN CORPORATION

ENVIRONMENTAL/GOVERNMENT GROUP

MK FERGUSON PLAZA
1500 W 3RD STREET
CLEVELAND, OHIO U.S.A 44113-1406
PHONE: (216) 523-5600
FAX: (216) 523-5201

November 11, 1998

Ms. Terese A. Van Donsel
Remedial Project Manager
Remedial & Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, IL 60604

Subject: Interim Measures Performed at Millennium Inorganic Chemicals Inc. Plant 2, $TiCl_4$ Facility, Ashtabula, Ohio

Dear Ms. Van Donsel:

Millennium Inorganic Chemicals Inc. (MIC) has safely and successfully completed Interim Measures in accordance with the Interim Work Plan and the 90% Remedial Design for the MIC Plant 2, $TiCl_4$ Facility. The Plant's annual maintenance shutdown and subsequent draining of the Plant 2 thickener tank allowed this work to be performed at this time.

The Interim Measures were performed by AWS Remediation. Morrison Knudsen Engineers and Constructors (MK) provided Quality Assurance oversight. Interim Measures activities began on October 22, 1998 and were completed on October 28, 1998. Interim Measures consisted of the excavation of all material containing ≥ 3.1 mg/kg PCBs from the area immediately east of the Plant 2 thickener tank, (located in the North Traffic Area); transport, placement and coverage of the excavated material at the Mining Residuals Pile (MRP); and backfill of the excavated area.

Attached are supporting documents that provide brief overview of the Interim Measures performed. The supporting documentation, included as Attachments A and B to this letter, are as follows:

- Attachment A - Health and Safety
- Attachment B - Drawing of Excavated Areas and Location of Stockpiled Material
- Attachment C - Photographs

The RA Completion Report will provide a more detailed description of the Interim Measures. If you have any questions, please contact this office or Paul Findlay (MIC) at 1 440-998-6406.

Sincerely yours,

John Singleton
Project Manager

cc: Paul Findlay - MIC w/ attachment
Mark T. McIntyre - MIC w/ attachment
Josef M. Shehabi - MIC w/ attachment
Rick Hughes - MIC w/ attachment

Attachment A
Health and Safety

Interim measures activities were performed in a safe manner consistent with the requirements of 29 CFR 1910.120. All workers within the exclusion zone (EZ) were OSHA 40-hour Hazardous Waste Operations and Emergency Response trained and were current in 8-hour refresher training. Prior to beginning activities, all workers were given Millennium's standard industrial training and a site specific indoctrination which identified the potential hazards involved with handling potentially contaminated PCB material. Additionally, a daily "toolbox" meeting was held that addressed day to day safety issues that included items such as; handling PCB materials, working in the vicinity of heavy equipment and excavation safety.

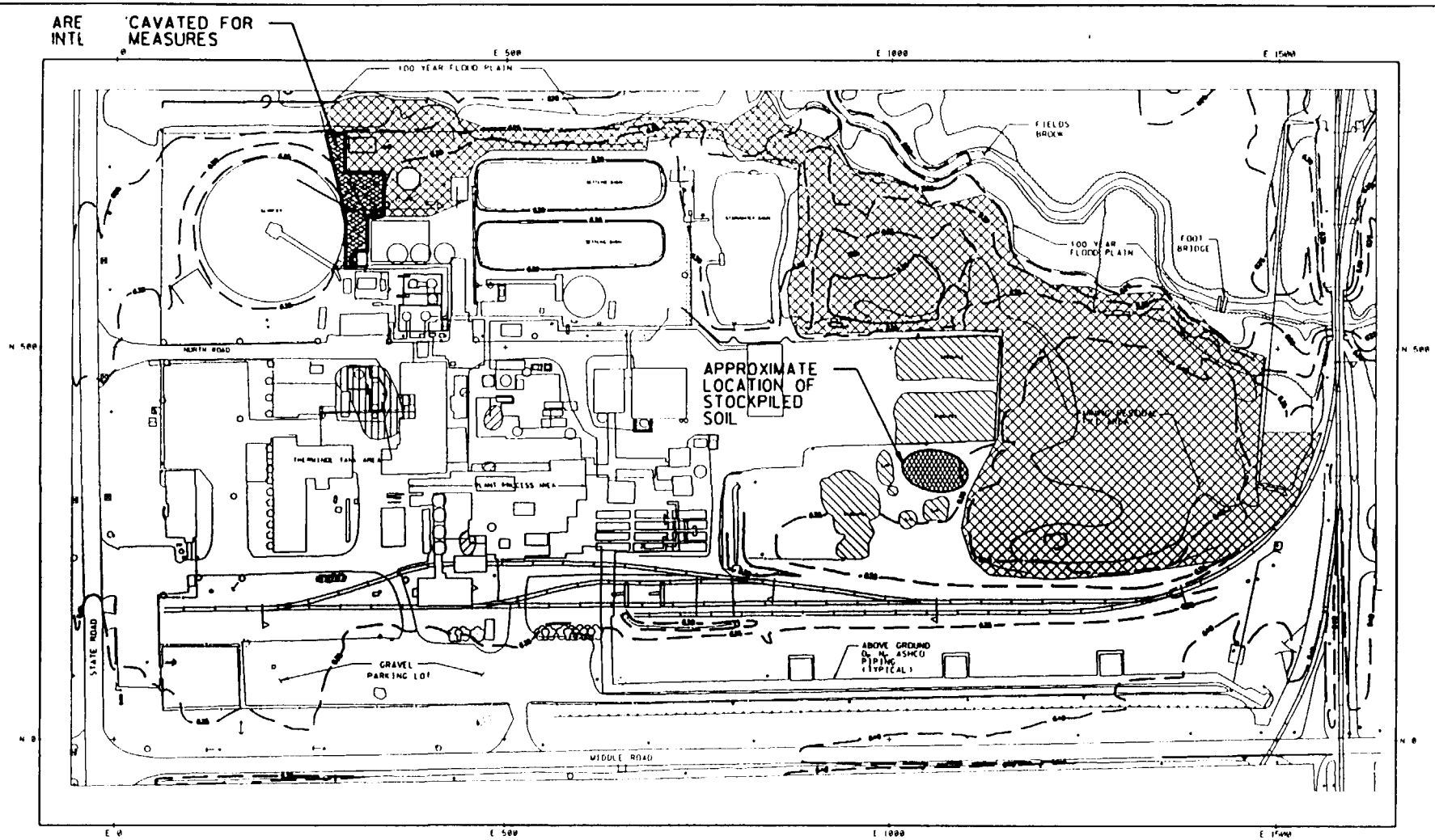
Temporary EZ fencing was installed around excavation areas and all personnel were required to don proper personal protective equipment (PPE) when entering the EZ. As excavation progressed, EZ fencing was adjusted to restrict access to those areas where potentially contaminated PCB material was being exposed. Workers leaving the EZ placed used PPE in plastic bags which were transported to the temporary storage area at the Mining Residuals Pile (MRP) with the excavated soil.

Upon completion of work activities, all major equipment that had worked in the EZ was decontaminated using a high pressure, low volume spray. All equipment remained on the decontamination pad until wipe test results indicated that the equipment contained no detectable PCBs.

Once waste placement at the MRP was complete, the waste was covered with approximately 6" of clean fill and the exclusion zone fencing was closed off to restrict access to the area.

Attachment B

Drawing of Excavated Areas and Location of Stockpiled Material



NOTE

UPON COMPLETION OF ITS PLACEMENT, ALL TEMPORARILY STORED SOIL WAS COVERED WITH A 6" CLEAN SOIL LAYER FOR EROSION CONTROL AND DUST SUPPRESSION.

SCALE: 1" = 200'

0 100 200 ft

MILLENNIUM INORGANIC CHEMICALS INC.
ASHTABULA, OHIO

DESIGNED	DRAWN
JO	JF
CHECKED	JO
REVIEWED	JK
RECOMMENDED	JO

INTERIM MEASURES
SOIL STORAGE LOCATION

MIC PLANT 2 TiCl. FACILITY REMEDIAL DESIGN

APPROVED	DATE	PROJECT MANAGER	DATE	PROJECT ENGINEER	DATE

REFERENCE DRAWINGS:
FEATURES.DGN
FLOOD1.DGN
BORDER.DGN
TOPOREF.DGN
EXC_DP05.DGN

PROJECT NO 4923-11

DRAWING NO. 4923x17

REV A

MORRISON KNUDSEN CORPORATION
ENGINEERING, CONSTRUCTION
& ENVIRONMENTAL GROUP
MK-FERGUSON PLAZA
1500 WEST 3RD STREET
CLEVELAND, OHIO 44113-1406
(216) 523-5600

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVL LDE	APPROVL DM	PROJ. ENG.
A		90% REMEDIAL DESIGN					

Attachment C
Photographs

7: PLACING WASTE IN STOCKPILE SOUTH OF CONCRETE PAD (FACING SOUTH)

8: SIX-INCH CLEAN SOIL COVER OVER WASTE NEARLY COMPLETE (FACING SOUTH)

5: PLACING FLOWABLE FILL SOUTH OF CLARIFIER PIPE (FACING SOUTH, GRID 129)

6: PLACING WASTE IN STOCKPILE SOUTH OF CONCRETE PAD (FACING SW)

3: EXCAVATION NORTH OF CLARIFIER PIPE (FACING SOUTH, GRID 127)

4: EXCAVATION SOUTH OF CLARIFIER PIPE (FACING SOUTH, GRID 129)

1: OVERHEAD VIEW OF EXCAVATION AT NORTH END (FACING NORTH, GRIDS 127, 131)

2: OVERHEAD VIEW OF BACKFILL AT NORTH END (FACING NORTH, GRIDS 127, 131)