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RF/RMRS-99-426.UN

FINAL CLOSE-OUT REPORT
BUILDING 788 AND CLARIFIER TANK
RCRA CLOSURE DECOMMISSIONING PROJECT

Rocky Mountain Remediation Services, L.L.C

Revision 0

October 1999

1/209

THE FINAL CLOSEOUT REPORT
FOR BUILDING 788 AND CLARIFIER TANK
RCRA CLOSURE DECOMMISSIONING PROJECT

The Final Closeout Report for Building 788 and the Clarifier Tank RCRA Closure Decommissioning Project has been reviewed and approved by:

Vern Guthrie
RMRS Project Manager

10/12/99
Date

John Law, Vice President
Project Planning and Execution

10/12/99
Date

Kent Dorr
K-H Project Manager

10/12/99
Date

Jim Archibald, Director
K-H Projects

10/13/99
Date

TABLE OF CONTENTS

ATTACHMENTS

ACRONYMS

ACM	Asbestos Containing Materials
AHA	Activity Hazard Analysis
ASF	Activity Screening Form
Be	Beryllium
CA	Contaminated Area
CCR	Contamination Control Room
CDD	Closure Description Document
CDPHE	Colorado Department of Public Health and Environment
D&D	Decontamination & Decommissioning
DOE	US Department of Energy
ER	Environmental Restoration
ISMS	Integrated Safety Management System
IWCP	Integrated Work Control Program
JHA	Job Hazard Analysis
K-H	Kaiser-Hill Company, L.L.C.
LO/TO	Lock Out / Tag Out
LLW	Low Level Waste
LLMW	Low Level Mixed Waste
ORC/PRC	Operations Review Committee / Process Review Commitee
POD	Plan of the Day
ppb	Parts per Billion
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RFETS	Rocky Flats Environmental Technology Site
RIR	Radiological Improvement Report
RMRS	Rocky Mountain Remediation Services, L.L.C.
RWP	Radiological Work Permit
SAP	Sampling and Analysis Plan
SCO	Surface Contaminated Objects
SEP	Solar Evaporation Pond
SHAP	Site Hazard Assessment Plan
SHAR	Site Hazard Analysis Report
WSRIC	Waste Stream Residue, Identification, and Characterization

PROJECT FINAL CLOSEOUT REPORT
BUILDING 788 AND CLARIFIER TANK
RCRA CLOSURE DECOMMISSIONING PROJECT

1.0 INTRODUCTION

The purpose of this closeout report is to document completion of the Building 788, Clarifier Tank Resource Conservation and Recovery Act (RCRA) Closure Project. (See Attachment 1 location map.)

The objective of this project was to remove Buildings 788, 788A, 308A, the Clarifier Tank and surrounding plywood structure, and to relocate trailer T788A from the project site. (See Attachment 2)

This project supports the site closure plan by performing dismantlement of several facilities and general removal of debris, excess equipment and materials from the Solar Evaporation Pond (SEP) area.

The mission of the Building 788 project was to perform cleanup of debris from the SEP area and dismantle the Clarifier Tank (138) along with the surrounding plywood structure by June 30, 1999. This activity was completed June 7, 1999 and satisfied the requirements of the Consent Order No. 97-08-21-01. (See Attachment 3)

2.0 REMEDIAL ACTION DESCRIPTION

2.1 GENERAL

The Building 788/207 Clarifier Removal Project was divided into two phases for performing the removal work. Phase I of the work was to remove debris in and around the Solar Ponds. The debris remained following the cleanup of sludge materials from the ponds. The second segment of work was to remove Building 788, 788A, Clarifier, Pug Mill, Building 308A, and relocate T788A.

2.1.1 MANAGEMENT REVIEW FOR READINESS

A graded approach to the management review was conducted for the debris removal to determine that all required documents were in place and correct in nature for the work to be performed. This was accomplished by Rocky Mountain Remediation Services, L.L.C. (RMRS) through a presentation to senior management by the Project Manager and project team. Following a general review by Kaiser-Hill Company, L.L.C. (K-H), the assessment was found acceptable.

The building removal portion of the project (Phase II) required a complete review/assessment and was first conducted by RMRS. The effort included an extensive review of the documents/plans required to safely perform work of this magnitude. The assessment included the following:

- Review of project documentation
- Extensive discussions/interviews with project members and the subcontractor
- Management walk-downs of the site

- Meetings with subcontractor craft to identify management expectations
- A project review by the Manager of Independent Safety

The K-H activity review process involved monitoring RMRS and the project subcontractor's preparations to start the demolition work. A checklist was developed and used as guidance for directing this activity. The review involved observing pre-evolution briefings, reviewing project documents and conducting interviews of management and craft personnel. Several pre-start findings were identified and once resolved, the project was given the authorization to proceed with demolition activities.

Approval of the Management Assessment was required prior to beginning decommissioning activities. The letters documenting the approval of the reviews and allowing work to progress is contained in Attachment 4.

2.1.2 INTEGRATED SAFETY MANAGEMENT SYSTEM

Consideration for safety was integrated into all facets of the Building 788 Cluster RCRA Closure Project. The Integrated Safety Management System (ISMS) principles (defining scope, identifying hazards, implementing controls, performing the work, and providing feedback) were utilized during project planning and the daily execution of work tasks. The Activity Screening Form (ASF) was completed as part of project planning.

On a project level, the hazards were identified as the scope was being developed. The resources were allocated and the project schedule was designed to address the implementation of the required controls. The Site Hazard Assessment Plan (SHAP), engineering documents, and the Integrated Work Control Packages (IWCP), including a Job Hazard Analysis (JHA), addressed the scope, the associated hazards, and the necessary safety controls as identified by the workers, at a more detailed level. The Subcontractor, in conjunction with the project craft personnel, prepared real time Activity Hazard Analyses (AHA).

The daily Plan of the Day (POD) meetings reviewed the scheduled tasks, hazards and safety issues. As a result, the project was successfully completed with only two first aid cases: one sore knee and one sore forearm.

2.2 CLOSURE DESCRIPTION DOCUMENT

The purpose of the Closure Description Document (CDD) was to describe the activities that were completed, in order to achieve complete closure of the RCRA units, in accordance with the closure plans contained in Part B of the Rocky Flats Environmental Technology Site (RFETS) RCRA Part B Permit. See Attachment 5 for the Summary Report of RCRA Closure for Units 21 and 48.

2.3 CHARACTERIZATION

The site was characterized for hazards and contamination to the extent possible. Access to 50% of Building 788 was limited due to waste crates, excess material and equipment, and due to the ongoing Clarifier tank RCRA Stabilization project.

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Two documents were developed as part of the Site Hazard Assessment program to characterize chemical and radioactive hazards in and around the facilities, for both waste management and health & safety purposes.

The first document was a Site Hazard Assessment Plan (SHAP). It provided the requirements and methodology to be used during the characterization process. The SHAP also implemented technical requirements of the RFETS D&D Characterization Protocol. Utilization of this document ensured that the characterization sampling performed, would be collected in accordance with the Site procedures. Additionally, an organization was responsible for data collection, verification, transmittal and archiving of sample information.

The Site Hazard Assessment Report (SHAR) identified the type, approximate quantity, condition, and location of both confirmed and potential sources of hazardous and radioactive substances present in the facilities. The report included both the summarization of the data into concise, usable formats, and interpretation of the data for use in management decisions.

Radioactive hazards were present as removable alpha in three localized areas. Fixed alpha contamination was prevalent in all the survey units except for the exterior walls of Building 788. Removable radiological contamination was discovered between the wall panels, and under the anchor base plates of the steel frame.

2.4 ASBESTOS REMOVAL AND STRIP-OUT

During the characterization process for identification of hazards, asbestos was identified in the roofing material on the coverings at the entrances to T788A. Early identification allowed the subcontractor to properly remove and dispose of this material. Throughout the demolition process, no additional Asbestos Containing Materials (ACM) were found. (See Attachment 6)

The subcontractor performed strip-out of certain electrical lines and systems within the building. This is because copper wire could not be placed into the same containers with conduit and other metals going to the recycle facility. Additional strip-out was performed on certain piping being removed to ascertain the presence of liquids and due to suspected contamination. Utilizing heavy equipment to remove the buildings minimized the amount of strip-out required.

2.5 UNFORESEEN SITE CONDITIONS

The project encountered numerous unforeseen site conditions during the demolition activities. In each situation, the associated work was paused. The appropriate project team members investigated the situation, changes were made to the work documents if required, and then Health and Safety performed a final review of the situation before releasing work. The following is a list of the conditions encountered:

- Beryllium contamination was detected in areas not accessible during characterization. Additional Personal Protective Equipment (PPE) and changes to work tasks were required.

- Domestic water valves were non-functional causing delays in isolating the utility from the buildings.
- Radiological contamination (fixed and removable) was detected on the concrete slabs, between the wall panels and on the insulation.
- The cement mixer, pug mill, and hopper contained loose cement.
- Extra layers of wood and rubber on the roof of Building 788A.
- Sludge was found in the bottom of the Clarifier.

In each situation, work was paused, subject matter experts were consulted, and a path forward was developed. Work packages were modified to include the new actions. As a result, all unforeseen site conditions were addressed without safety issues.

2.6 DEMOLITION

Prior to demolition, all utilities were disconnected from the buildings. Utilities included power, water (domestic and fire), natural gas and sanitary sewer. In addition, all ACMs were removed properly and packaged for removal from site.

Radiological surveys were conducted in and around Building 788, 788A, 308A pumphouse and the Clarifier. The buildings and associated equipment/debris were characterized under Surface Contaminated Object (SCO) criteria and the results are documented in Section 6. Many areas contained radioactive contamination above the unrestricted release criteria. The project characterized and shipped the waste according to SCO limits. The project ensured that the SCO limits were not exceeded and that all removable contamination was decontaminated or sprayed with a permanent fixative prior to packaging and/or shipping waste.

One area of the Building 788 slab (Contamination Control Room [CCR] -interior Building 788/Northwest side) contained removable alpha and was deconned accordingly. In addition, the Building 788 slab was considered to have "fixed" contamination in several locations. The project did not attempt to decon "fixed" contamination. As a protective measure prior to demolition, six to eight inches of roadbase fill was placed onto the slab for protection during the building removal process. On the 207 Clarifier slab, fixed contamination was present. The surface contained an epoxy, which was placed as a protectant, prior to/during the Clarifier operation era. The epoxy was peeling in several places. As a protective measure against further deteriorization, the peeled epoxy was removed, and the slab was encapsulated with a fixative epoxy paint (a two-coat application).

Certificates of Destruction were completed for each of the buildings once demolition was complete (Attachment 7). These were filed with the DOE Realty Officer.

2.7 WASTE MANAGEMENT

All waste generated during strip-out, asbestos abatement, and demolition was handled in accordance with the project Waste Management Plan and applicable plant procedures. All waste characterization, packaging, shipment, and documentation was supervised by a full time Environmental Coordinator/ Waste Management Specialist. Refer to Section 2.8 for additional information on waste management.

2.8 FINAL DISPOSITION OF WASTES

The information contained in Attachment 8 lists the final volumes of all wastes generated during the Building 788 RCRA Closure Project. Also included is a Waste Stream Residue Identification and Characterization (WSRIC) Summary for the waste stream generated during the closure of the buildings and associated equipment.

Waste minimization was effectively demonstrated during the entire process by reclaiming almost all the steel waste items as recycle metal. Since the material could not be free released from a radiological perspective, it was shipped to GTS Duratek in Oakridge, Tennessee, where it becomes shielding for the nuclear industry. Additionally, the fiberglass insulation between the wall was surveyed and determined to be free releasable. The insulation from the ceiling was determined free releasable following the segregation of the backing materials from the bulk insulation. The plywood found in the roof on the north side of Building 788A, was separated from the rubberized membrane roofing material, to reduce the Low Level Waste generated. The plywood was packaged and disposed of as Sanitary Waste.

All waste generated during the project was removed from the site. Building 788, 788A, 308A, Clarifier tank and associated structures, and the Pug Mill were removed down to the respective building/facility concrete slabs. The building slabs are considered components of RCRA Units 21 and 48 and will be evaluated by Environmental Restoration (ER) during the process of ranking all remaining site areas.

3.0 REMEDIAL ACTION GOALS VERIFICATION

3.1 REMEDIAL ACTION GOALS

Verification of the Remedial Action goals for the Building 788 RCRA Closure project is summarized in several reports. Table 3-1, Verification Documentation and Remedial Actions identifies the associated verification reports of the subscribed actions.

TABLE 3-1
VERIFICATION DOCUMENTATION AND REMEDIAL ACTIONS

REMEDIAL ACTIONS	VERIFICATION DOCUMENTATION
Removal of Clarifier Tank and the surrounding plywood structure. Consent Order 97-08-21-01	Letter of Notification of Completion. Photographs of work site (Attachment 9).
Closure of RCRA Units 21 and 48	Closure Certification Report (Attachment 9).
Building 788 interior surfaces were decontaminated as necessary, building dismantled, and the concrete slab to remain in place.	Letter of Notification of Completion. Photographs of work site (Attachment 9).
Clarifier Tank, and woodshed dismantled.	Letters of Completion and Photographs. (Attachment 9)
The process piping inside Building 788, T788A, Clarifier, Pug Mill and other equipment disconnected. Wiring terminated at the power source. Conduit was removed to a practical location with the remaining conduit abandoned in place and labeled.	Letters of Completion and Photographs. (Attachment 9)
The two power poles at the southwest corner of Building 788 have been removed. Removed power poles cut off at grade.	Letters of Completion and Photographs. (Attachment 9)
The equipment and structures on the southeast side of Building 788 have been demolished and removed. This includes the Pug Mill, steel rack, temporary equipment for sludge transfer, forklift, and the concrete/timber ramp. The flexible hose running from the Clarifier to the loading station was removed.	Letters of Completion and Photographs. (Attachment 9)
The protruding concrete stem walls and foundations on the north side of Building 788 and concrete foundations around Building 788 (south side) have been removed to the extent practical to facilitate filling and grading the area with soil.	Letters of Completion and Photographs. (Attachment 9)
The jersey barriers on the south access road to Building 788 have been relocated to PU&D, and the bollards have been removed at grade.	Letters of Completion and Photographs. (Attachment 9)

It is noted that there were no releases to the environment of any contaminants due to the decommissioning of the Building 788 Cluster.

3.2 DOCUMENTATION OF REMEDIAL ACTIONS

All records for the Building 788 Cluster RCRA Closure Project have been controlled as required. Attachment 10 lists the project documents what will be maintained as part of the Operating Record.

4.0 SITE RECLAMATION

Soil remediation was not within the scope of this project. As described in the CDD, subsurface contamination identified during the course of the project will be evaluated by the RMRS ER department.

5.0 LESSONS LEARNED

The Building 788 Closure Project was completed without serious personal injuries or environmental impact, but the project experienced several unknown site conditions that impacted the budget and schedule. Lessons Learned for the project are stated in Attachment 11.

6.0 RADIOLOGICAL CHARACTERIZATION OF SURFACE CONTAMINATED OBJECTS (SCO):

The Building 788 Cluster, consisting of Building 788, 788A, Trailer 788A, Pump House 308A, Tank 207A, and various pieces of ancillary equipment, was surveyed in accordance with PRO-267-RSP-09.05, *Radiological Characterization of Surface Contaminated Objects*. This procedure allows the determination of "Surface Contaminated Objects" under the Department of Transportation regulation 49 CFR 173, Subpart I, and to determine the appropriate SCO categorization.

The 788 Cluster was divided into ten SCO Characterization Survey Units. All characterization units qualified under the SCO I categorization based on the upper limits established for SCO I and/or application of a permanent fixative, see "The Site Hazard Assessment Report for Buildings 788 & 207A Clarifier," RF/RMRS-98-299.UN, Revision 1, for detailed radiological survey results and applicable SCO documentation.

Attachment 12 provides detailed information regarding surveys performed and the results.

7.0 CONCLUSION

Earlier this month, the removal of Building 788 and the associated pondcrete processing equipment, including the Clarifier, was completed. This work was performed to meet the requirements of an Order of Consent issued by the Colorado Department of Public Health and Environment (CDPHE). We have met the state's deadline to remove the Clarifier by June 30, 1999. Removal of the building, RCRA Unit 21, and the process line, RCRA Unit 48, was governed by the respective closure plans for permitted and interim units. While the physical work of building and equipment removal is now complete, meeting the removal requirement, the units will not be formally closed until a closure report is prepared and accepted by CDPHE. That work is currently underway.

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In an effort to track the work done to date to ensure environmental compliance, the project files have been reviewed. Attachment 9 summarizes the environmental documents prepared to support this project, including date prepared or approved, as appropriate, author, if known, and a brief description. This table will be updated upon final acceptance of the closure report submitted to CDPHE.

8.0 REFERENCES

Building 788 Project Execution Plan (PEP), Revision 0, March 1999

Foster-Wheeler, Building 788 Decommissioning Project Health and Safety Plan, Revision 2, April 1999

Waste Management Plan for Building 788, Revision 0, December 1998

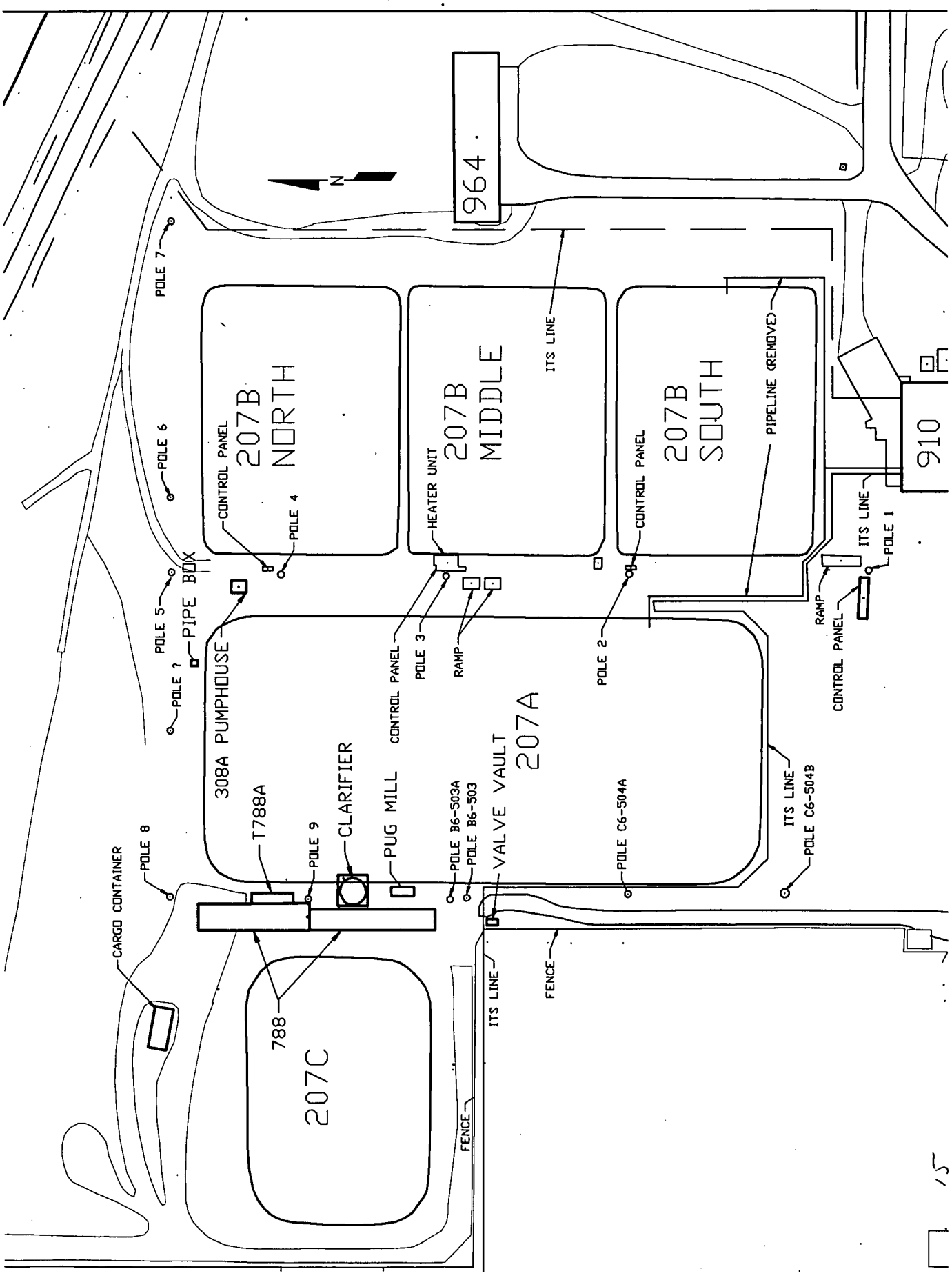
Site Hazard Assessment Plan, Revision 1, December 1998

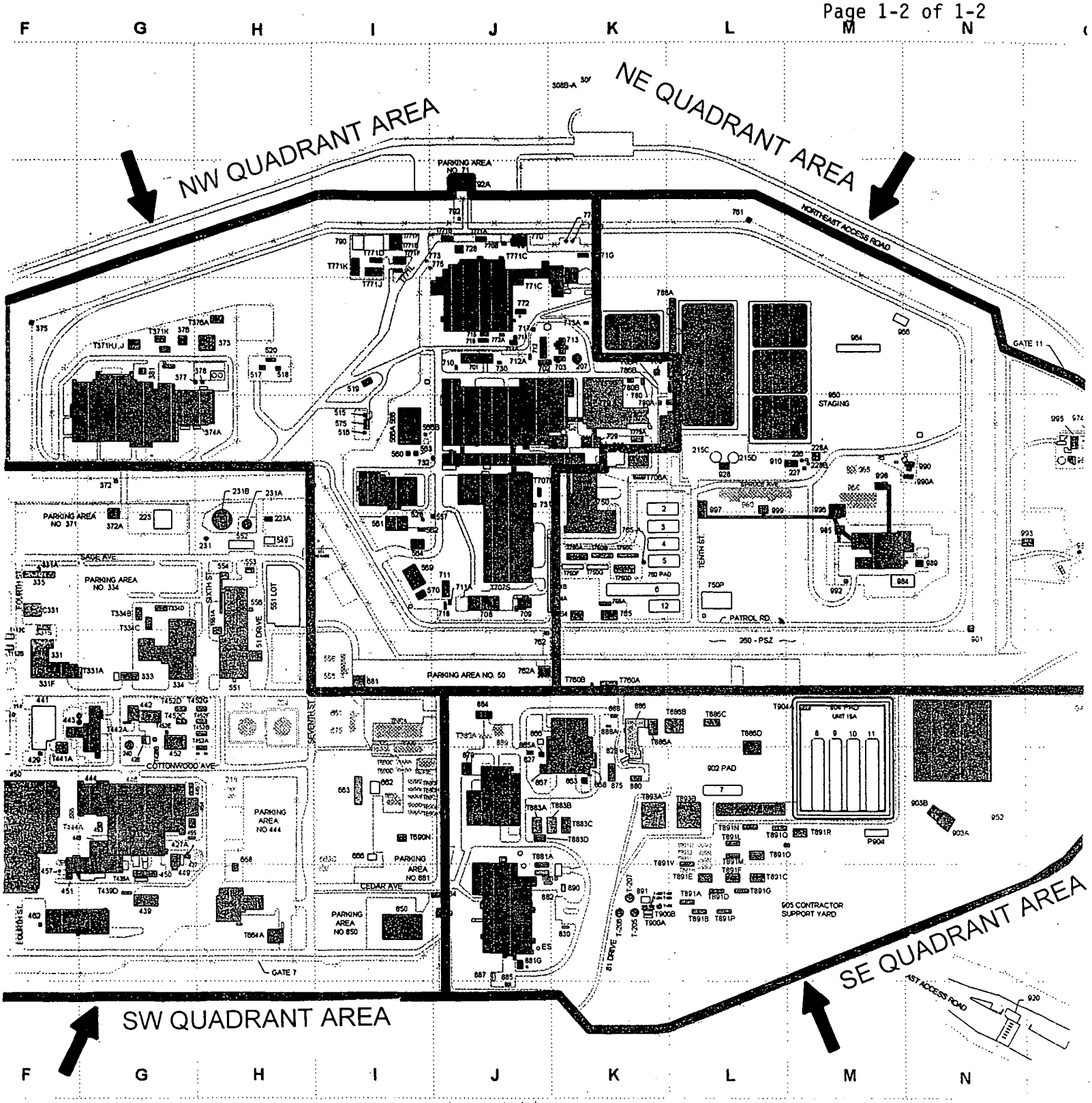
Site Hazard Assessment Report, Revision 1, May 1999

Foster-Wheeler Demolition Plan, Revision 2, March 1999

ATTACHMENT 1

PROJECT LOCATION AREA
PLAT PLAN

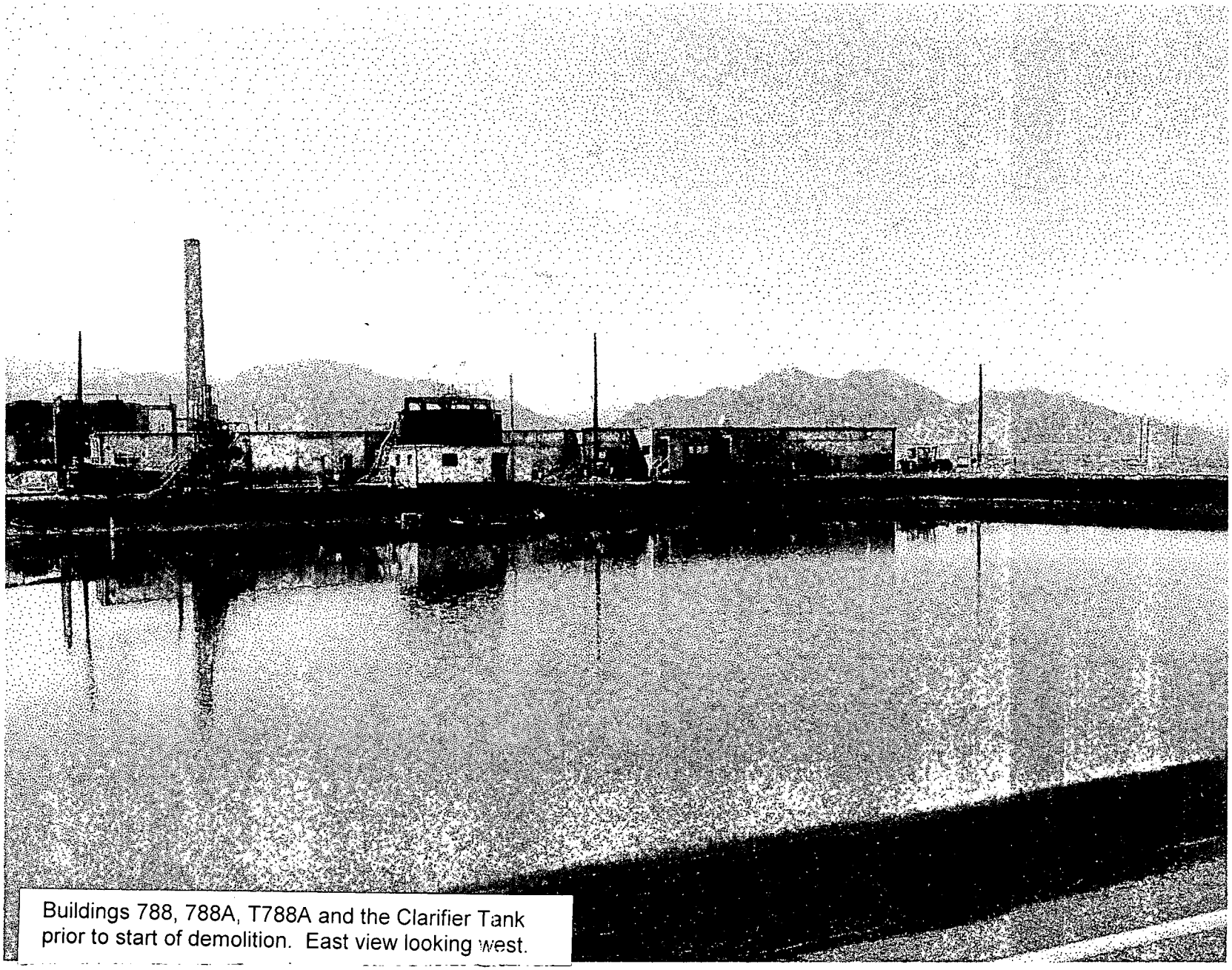

964
910
N
POLE 7
POLE 6
POLE 5
POLE 4
POLE 3
POLE 2
POLE 1
POLE 8
POLE 9
POLE B6-503A
POLE B6-503
POLE C6-504A
POLE C6-504B
CONTROL PANEL
HEATER UNIT
CONTROL PANEL
CONTROL PANEL
207B NORTH
207B MIDDLE
207B SOUTH
ITS LINE
PIPELINE (REMOVE)
ITS LINE
RAMP
RAMP
PIPE BOX
308A PUMPHOUSE
T788A
CLARIFIER
PUG MILL
VALVE VAULT
207A
ITS LINE
ITS LINE
CARGO CONTAINER
788
207C
FENCE
FENCE



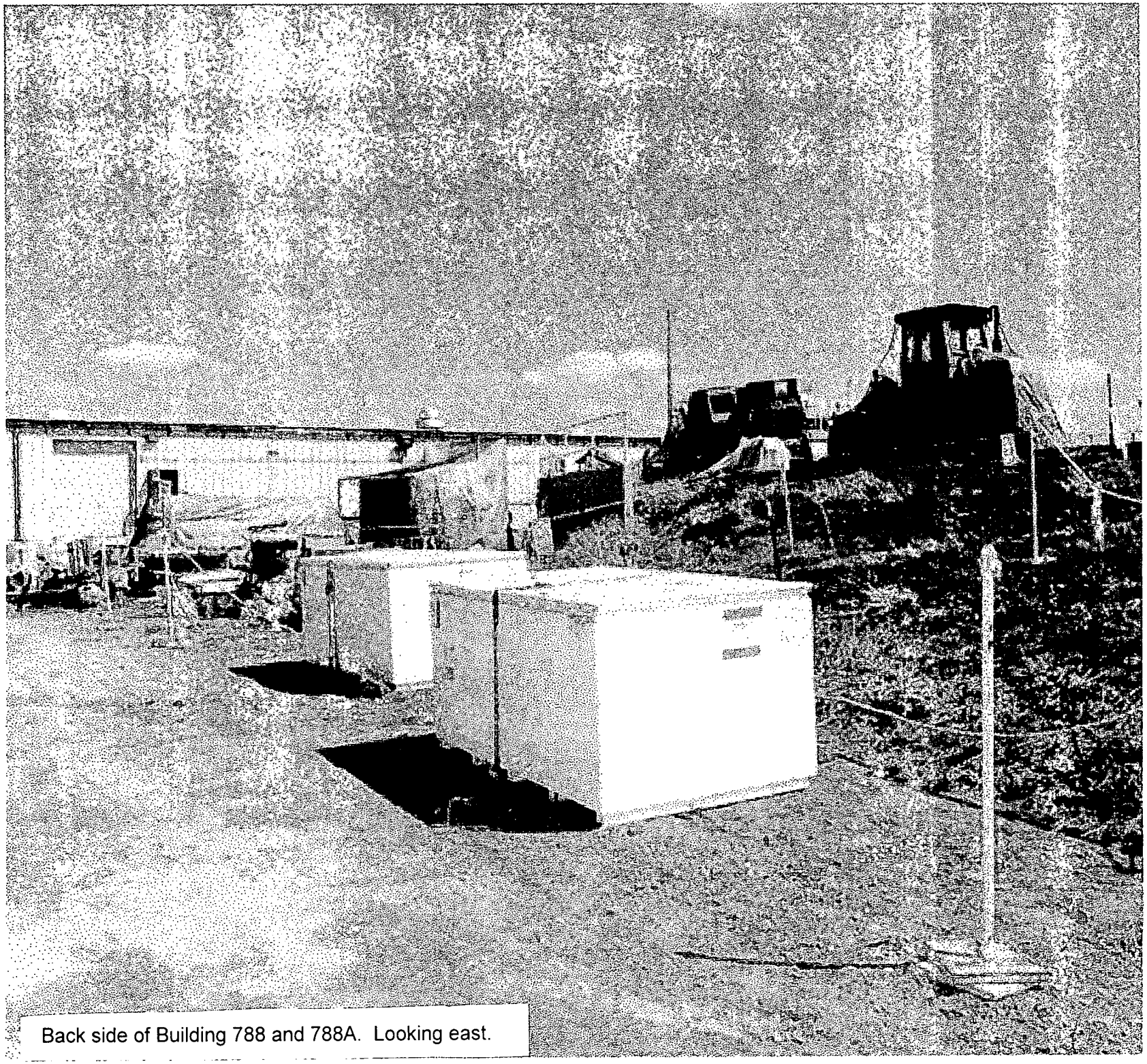
RFETS
Site Closure Quadrants

ATTACHMENT 2

PHOTOGRAPHS



Buildings 788, 788A, T788A and the Clarifier Tank prior to start of demolition. East view looking west.



Back side of Building 788 and 788A. Looking east.

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ATTACHMENT 3

CONSENT ORDER 97-08-21-01
AND
PERFORMANCE MEASURE
99/00-07.3R

KAISER•HILL
COMPANY

April 3, 1998

VIA TELECOPY AND MAIL
(303) 759-5355

TRANSMITTING TWO PAGES

Joe Schieffelin, Unit Leader
Permits and Compliance Unit
Federal Facilities Program
Colorado Department of Public Health
and the Environment
4300 Cherry Creek Drive So., B-2
Denver, CO 80222-1530

Dear Mr. Schieffelin:

This letter is to set forth the agreements we have reached regarding the below described issues.

A. 1997 Tank Management Plan

The Tank Management Plan will be revised as follows.

1. The Solar Ponds Clarifier Tank. The scheduled RCRA stable commitment will be changed from March 31, 1998 to August 25, 1998, and a new commitment will be added to dismantle the tank by June 30, 1999. "Dismantling" the tank means to take it and the building surrounding it apart, cut up the tank, package the resultant waste, and store the waste appropriately. There will be, as discussed, a delay in the work between the tank's becoming RCRA stable and the dismantling work beginning. During this period, the tank will be partially filled with water for radiological protection purposes. If the dismantled tank constitutes mixed waste, inspection requirements will be agreed to when the waste is transferred to a permitted unit.

2. Buildings 444/447 and Southwest Portion of RCRA Unit #40. The scheduled RCRA closure dates of June 30, 1998 and October 31, 1998, respectively, are deleted and replaced with the following commitment. Funds totaling $400,000 will be used to prepare and ship low level waste (LLW) or low level mixed waste (LLM) off-site this fiscal year in an amount over and above the current baseline targets of 2,945 cubic meters of LLW and 4,094

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

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cubic meters of LLM. The $400,000 includes packaging, certification, transportation and disposal costs. Additionally, Kaiser-Hill will cause interim status tanks 40.04 and 40.05 in Building 444 to be integrity tested on a periodic basis. You have suggested testing the tanks every two years beginning in fiscal year 1999. We have conceptually agreed to conduct the tests, and John Wrapp is now in the process of discussing the issue with the appropriate engineers. By next week, Mr. Wrapp should be able to advise Mr. James Hindman of the results of those discussions and reach an agreement with him on that issue.

B. Building 123

The rinsate analytical results from sump 157 in Building 123 reveal nickel at 111 ug/L, whereas the RFCA Tier 2 action level for nickel is 100 ppb. We have agreed this sump shall be considered clean closed inasmuch RCRA does not regulate nickel.

The rinsate analytical results from sump 125 in Building 123 reveal lead at 56 ug/L, and the RFCA Tier 2 action level for lead is 15 ppb. The rinsate sample analytical results for the underground pipe at Building 123, which is a portion of RCRA unit 40, reveal chromium at 588 ug/L and lead at 21.7 ppb. The RFCA Tier 2 action levels for these two constituents are 100 ppb and 15 ppb, respectively. We have agreed any further requirements for sump 125 and the underground pipe will be deferred to environmental restoration. Furthermore, we have agreed to initiate discussions about deferral requirements.

If the foregoing does not accord with your understanding of our agreements, please call me immediately at 966-3722 so we may resolve our differences. If you do not notify me in writing otherwise by the close of business today, April 3, 1998, I will assume this letter accurately sets forth our understanding, and Mr. Wrapp will proceed with revising the 1997 Tank Management Plan.

Sincerely,

Florence J. Phillips
Assistant General Counsel

cc: Rick DiSalvo, Esq.
Mr. Dave Shelton
Mr. John Wrapp

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RATING PLAN

99/00-07.3R

Measure No.

SECTION I - ACCOUNTING INFORMATION

Initial Budgeted Cost of Work Scheduled (BCWS) under this PM:	Maximum Available Incentive Fee Associated with this Measure: $250,000

PBS No.	WBS Element No(s).	Fee Billings should reflect B&R Code No.
15	1.1.06.01.04	

SECTION II - CLOSURE PROJECT WEIGHTING

Closure Project Impact Rating (4=High, 2=Medium, 1=Low)

Critical Path: 1 Cost: 1 Technical Difficulty: 1 Safety/Risk: 1

This Performance Measure supports site **closure in 2010.**

Rocky Flats Closure Project Management Plan commitments are supported by this Performance Measure.

SECTION III - PERFORMANCE MEASURE

NE Quadrant Decommissioning and Demolition

1. Demolish B308A and all ancillary treatment equipment, and remove all excess equipment and debris in and around the solar pond area by September 30, 1999.
2. Dismantle the 207A Clarifier (tank 138) and surrounding plywood structure by June 30, 1999.
3. Demolish Buildings B788, B788A, and T788A by September 30, 1999.

SECTION IV - PERFORMANCE REQUIREMENTS

PREVIOUS YEAR'S GATEWAY *Describe previous year's gateway (if applicable) that must be completed before fee can be paid under this performance measure. The requirements listed below are the only gateway requirements for this PM.*

None

DEFINE COMPLETION *Specify Performance Elements and describe indicators of success (quality/progress). Include baseline documents/data against which completion documentation should be compared.*

1. Demolish B308A and all ancillary treatment equipment, and remove all excess equipment and debris in and around the solar pond area. This includes piping and power supply modifications to the Modular Storage Tank transfer system by September 30, 1999.
   - Demolition is defined as complete removal of the building structures above the slab. Seal and cap all pipes at slab level or below grade. The slab and below grade openings will be capped or protected from the environment.
   - The resultant waste must be packaged, stored in a compliant manner and/or disposed properly.
2. Dismantle the 207A Clarifier and surrounding plywood structure by June 30, 1999, in accordance with the Hazardous Waste Tank Consent Order (#97-08-21-01).
   - Dismantling of the tank means to take the tank and the building (plywood structure) surrounding it apart, remove the tank, package and certify the resultant waste for shipment, and stored on site, and/or dispose the waste off-site in a compliant manner
   - Capped pipes may protrude from the pad or below grade openings. The slab and below grade openings will be capped or protected from the environment.
   - The resultant waste must be packaged, stored in a compliant manner and/or disposed properly.
3. Demolish B788, B788A, and T788A by September 30, 1999.
   - Demolition is defined as complete removal of the building structures above the slab. Seal and cap all pipes at slab level or below grade. The slab and below grade openings will be capped or protected from the environment.
   - T788A will be removed from the Northeast Quadrant unless otherwise approved for reuse by DOE, or as scrap or waste as appropriate by September 30, 1999.

RATING PLAN

99/00-07.3R

Measure No.

Cost Restrictions:

The following terms and conditions apply to the cost restrictions:

- the cost restriction will be calculated on total CV of all WBS elements identified on this rating plan
- CV will be calculated at the measurement point(s) using the Budgeted Cost of Work Performed (BCWP) derived by the earned value method approved by the RFFO SCCB (and based on the budgeted cost approved by the RFFO SCCB) and compared to the ACWP from M*PM at the measurement point(s).

$$\%CV = \frac{\text{BCWP (based on BCWS)} - \text{ACWP}}{\text{BCWP (based on BCWS)}} \times 100$$

- measurement point(s) for applying the cost restriction calculation will be at the end of FY99 unless the entire PM is completed sooner then the measurement point will be at the completion date.
- fee forfeited at a measurement point under this cost restriction clause is not recoverable should the cumulative negative CV recover to a positive CV later in the rating period
- If within 90 days of a measurement point it is determined that costs had been incorrectly stated in the cost accounting system at the measurement point, an appropriate retroactive adjustment (either loss or award) will be made. .
- the earned value calculation methodology for the activities identified by the WBS elements in this rating plan may not be changed from the beginning earned value method unless the proposed change is approved by the RFFO SCCB
- BCWS based on the budgeted cost approved by the RFFO SCCB may be changed only in accordance with SCCB procedures.

DEFINITIONS:

BCWS Approved By RFFO SCCB: The Budgeted Cost of Work Scheduled (BCWS) is the beginning FY 99 budgeted cost for this PM as approved by the RFFO SCCB, including any BCPs approved during the year. Cumulative FY 99 budgeted cost for use in this PM is also defined as FY 99 ending RFFO SCCB approved budgeted cost.

$$\text{Cost Variance \% (CV)} = \frac{\text{BCWP (based on BCWS)} - \text{ACWP}}{\text{BCWP (based on BCWS)}} \times 100$$

BCWP: The Budgeted Cost of Work Performed (BCWP) is the earned value at the measurement point. The BCWP used for cost restrictions will be based on the SCCB approved budgeted cost, which is the beginning FY 99 budgeted cost for this PM including any BCPs approved during the year. Cumulative FY 99 BCWP for use in this PM is also defined as FY 99 ending BCWP, as based on the RFFO SCCB approved budgeted cost.

COMPLETION DOCUMENTS LIST: *(In addition to the Completion Report, the document(s) that should be submitted/ data that should be available/ actions to be taken by evaluator, to determine actual performance to the requirements stated above.*

- Final Project Close-out Report per RFCA guidelines.
- A list of all waste package identification numbers.
- Facility walkdown conducted by K-H and RFFO. A walkdown report will document the removal of the facilities and the corresponding waste package identification.
- ~~Property disposition paper work for removal of all equipment in accordance with DOE property disposition regulations.~~
- BCWS Reconciliation Schedule for Cost Variance Calculation - The Contractor must submit a BCWS reconciliation schedule with the completion documents. The schedule must show the beginning year budgeted cost approved by the SCCB and all modifications to the WBS baseline. This includes all Type I and Type II BCPs and ACPs. The schedule should reflect the BCP/ACP number, the date processed, the amount of the budget change, and the cumulative impact of the change. Cost variance will be calculated using the RFFO SCCB approved budgeted cost.

RFE 2/3/99

JJK 2/3/99

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RATING PLAN

99/00-07.3R

Measure No.

ASSUMPTIONS/TECHNICAL BOUNDARY CONDITIONS: ***For reasonably foreseeable impacts to performance which are not covered under the Contract. If the assumption or condition proves false the remedy is renegotiation unless stated otherwise.***

The approved 004 IM/IRA will be utilized as the Final closure Decision Document, and that an additional PAM will not be required.

SECTION V - EARNINGS SCHEDULE

List percent of PM fee available for completion of each Element, and the schedule by which the fee may be earned. (Schedule identifies point(s) at which fee may be earned - does not define completion.)

1. 40% of PM fee for dismantling of the 207A Clarifier (tank 138) and surrounding plywood structure by June 30, 1999 and for demolition of B308A and all ancillary treatment equipment by September 30, 1999.
2. 60% of PM fee for demolition of B788, B788A, and T788A by September 30, 1999.

The following cost restrictions apply to this PM:

- fee earned for this performance measure shall be reduced at the measurement point(s) by:
  1% for every negative 1% cumulative Cost Variance (CV) > -12% ≤ -17%
  3% for every negative 1% cumulative CV > -17% but ≤ -22%,
  5% for every negative 1% cumulative CV > -22%
- total fee reduced under this cost restriction clause shall not exceed 75% of fee earned for this PM

SECTION VI - SIGNATURES

Responsible K-H Mgr:	Kaiser-Hill President	Signature of Kaiser-Hill President	Date Signed
A. Parker Initial	Robert Card		2/3/99
Responsible RFFO Mgr:	RFFO Manager	Signature of RFFO Manager	Date Signed
J. Legare Initial	Jessie Roberson		9/29/98

ATTACHMENT 4

MANAGEMENT READINESS ASSESSMENT

CORRES. CONTROL
OUTGOING LTR. NO.
DOE ORDER #.

99-RF 0 1 0 8 4

DIST.	LTR	ENC
BENSUSSEN, STAN		
BORMOLINI, ANN		
BRAILSFORD, MARV		
BURDGE, LARRY		
CARD, BOB		
FULTON, JOHN		
HARDING, WYNN		
MARTINEZ, LEN		
PARKER, ALAN	X	
POLSTON, STEVE		
SHELTON, DAVE		
TUOR, NANCY		
Crowe, Steve	X	X
Beutler, Carl		
Bruse, Jill	X	X
Buhl, Tony		
Daniels, Kevin		
Francis, Gary		
Miller, John		
Walker-Lembke, S.		
Lyle, J.	X	X
Miller, G.	X	X
Parry, K.	X	X
Guthrie, V.	X	X
Hedahl, Tim		
Mathis, Brian		
Pizzuto, Vic		
Rodgers, Alan		
Walker, Randy		
CORRES.CONTROL	X	X
ADMIN RECRD/080		
PATS/T130G		

CLASSIFICATION:		
UCNI		
UNCLASSIFIED	✓	✓
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE: UNJ 3/19/99

IN REPLY TO RFP CC NO.:

ACTION ITEM STATUS:
☐ PARTIAL/OPEN
☐ CLOSED

LTR APPROVALS:

ORIG. & TYPIST INITIALS:
SJB :rwa

RF-46469 (Rev. 1/99)

KAISER•HILL
COMPANY

March 18, 1999

99-RF-01084

David C. Lowe
Acting Deputy Manager
DOE, RFFO

BUILDING 788 DEMOLITION ASSESSMENT NOTIFICATION - AMP-054-99

Kaiser-Hill (K-H) is submitting written notification to the Office of the Acting Deputy Manager informing DOE that Closure Projects is ready to perform a Management Review of Rocky Mountain Remediation Services' Building 788 Demolition. Sandy MacLeod has been involved in the coordination of this review. The K-H Management Review is formally scheduled to start the week of March 22, 1999. Attached is the Closure Project Assessment Plan for your review.

Oversight activities related to the Building 788 Demolition work will be performed by K-H Closure Projects as the work progresses.

If you have any questions on this matter, please contact Jill Bruse at extension 4807 or pager 212-3377.

Alan M. Parker
Vice President
Closure Projects Integration

SJB:rwa

Attachment:
As Stated

Orig. and 1 cc – D. C. Lowe

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

ASSESSMENT PLAN
B788 Closure Project

ASSESSMENT ID NUMBER: 99-XXXX-KH (99-027-CPEI) DATE: 2/18/99

ASSESSMENT DRIVERS:
- Readiness Determination Manual
- Site Integrated Oversight Manual
  - Closure Project Engineering and Integration (CPE&I) Group Charter/Quality Assurance Program Plan and Management Plan

ASSESSMENT PURPOSE: The purpose of this assessment is to verify RMRS readiness to perform the B788 closure project. Additionally, daily performance oversight will be provided by the appointed facility representative to monitor performance and provide mentoring.

ASSESSMENT SCOPE: The B788 Cluster Closure Project includes B788, trailer T788A, the clarifier tank, Building 308A, miscellaneous structures, equipment, and debris in the immediate vicinity. All of the equipment and materials were associated with the production/processing of pondcrete in RCRA Unit 48 or the storage of pondcrete in RCRA Unit 21. Building 788 will be dismantled down to the slab. The T788A support trailer will be moved to another location within the Protected Area to support other projects. Once the pre-start findings identified in the assessment are brought to closure, Kaiser-Hill will issue a startup letter. DOE will provide oversight of our process.

ASSESSMENT TYPE: Management Review

FREQUENCY: The readiness determination assessment will occur once prior to the project initiation. Programmatic oversight will continue throughout the life of the project.

ASSESSMENT TECHNIQUES: A team will be utilized for the readiness assessment. A readiness team will be established by Closure Projects Integration (CPI) to provide a thorough review of the B788 closure project activities and preparation to assure that the project activities will be performed safely and compliantly. Area specific subject matter experts (SMEs) will supplement the assessment team as needed. The assessment will be accomplished by a combination of interviews, document reviews, and direct observation of field activities.

DOE

TBD - DOE Oversight

Team

Jill Bruse – Oversight Lead	X4807	DP 212-3377
Greg Schmalz - Fire Protection	X6815	DP 1-888-516-8822
Duane Parsons - Radiological Protection	X5442	DP 212-5072
Rhonda Hunt - Safety and Industrial Hygiene	X5263	DP 392-2477
Paul Miles - Quality Assurance	X7949	DP 212-1978
Beth Casias-Hanlon - Training Oversight & Integration	X3380	DP 212-3410
J.J. Mackin - Conduct of Ops and D&D	X3765	DP 212-5606
Blake Blewitt - Management Operations	X4155	DP 212-1965
TBD -Environmental Compliance		
Ruth Peterson - Records Management	X4143	DP 212-3943
Doug Iden - Authorization Basis	X8353	DP 212-6627

CRITERIA: The Site Integrated Oversight Manual (1-MAN-013-SIOM) describes the methodology and requirements for implementation of this oversight activity. The RFFO AMEC procedure identifies both the minimum core elements and optional additional elements of the assessment to be performed. The team will evaluate the elements for applicability and grading, and will develop the criteria for the assessment.

DELIVERABLE: A final assessment report will be issued. Issues generated from the assessment will be documented on Issue Identification Forms. A copy of the Issue Identification Form will be provided to the project as soon as generated. Once the issue has been classified as to severity (such as deficiencies or conditions adverse to quality in accordance to the Site Quality Assurance Manual), they will be documented and processed in accordance with 1-MAN-012-SCARM, Site Corrective Action Requirements Manual. Before closure, additional interviews, performance demonstrations, drills, document reviews and/or other activities may be required.

Approval: _____

Alan M. Parker
Vice President
Closure Projects Integration

Item	Checklist	Requirement	Supporting Documentation	Results
	Environmental Compliance			
1	Verify that the RFCA/CERCLA decision document (i.e. Proposed Action Memorandum [PAM], Decommissioning Operations Plan [DOP], etc.) and all modifications/amendments have been reviewed and approved by Environmental Compliance and Operations (ECO), K-H, DOE and EPA/CDPHE.	CERCLA, RFCA Part 9; note paragraph 115	• Final Proposed Action Memorandum. • Approval of PAM from EPA.	
2	Verify that the ECO environmental assessment has been completed for the identification of applicable regulatory requirements (ARARs).	CERCLA, RFCA Part 4, paragraph 11	• Final Proposed Action Memorandum. • KH-ECO Environmental Checklist.	
3	Verify that the NEPA assessment has been completed for the identification of environmental impacts.	DOE Secretarial Policy for NEPA - Equivalent Values	• Final Proposed Action Memorandum. • Approval of Final Proposed Action Memorandum by U.S. Environmental Protection Agency. • KH-ECO Environmental Checklist.	
4	Verify that the D&D or Remediation project characterization study, which identifies contamination and the associated hazards, has been completed and is adequate.	CERCLA, RFCA-Buildings: RFCA paragraph 118 and Attachment 9; ER RFCA paragraph 118 and Attachment 5; RFCA Appendix 3	• Final Proposed Action Memorandum. • Sampling and Analysis Plan. • Site Specific Health and Safety Plan.	
5	Verify the development of the Field Implementation Plan or equivalent. Verify that this document outlines execution of the actions described in the PAM (environmental issues).	Documents/ commitments referred to in the RFCA decision document; RFCA Part 9, note paragraph 118	• Field Implementation Plan. • Operations Order. • Sampling Analysis Plan. • Site Specific Health and Safety Plan.	
6	Verify that a Sampling Analysis Plan (SAP) has been developed. Verify that the SAP appropriately defines the specifications for sampling and analysis. (supports characterization of waste stream and WAC)	Documents/ commitments referred to in the RFCA decision document; RFCA Part 9, note paragraph 118	• Sampling and Analysis Plan.	

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Item	Checklist	Requirement	Supporting Documentation	Results
7	Verify that there is a contingency plan to address un-anticipated contaminants, contaminant levels or other hazards for • Safety/exposure issues • Air impacts • Water impacts • etc.	Documents/ commitments referred to in the RFCA decision document; RFCA Part 9, note paragraph 118	• Site Specific Health and Safety Plan. • RMRS Safety and Environmental Stewardship Directive OPS-DIR-001, Revision 2, Effective 08/15/97. (undergoing revision)	
8	Verify that there is a RCRA contingency plan.	RCRA Part B Permit; CHWR Part 264-Subpart D	• Final Proposed Action Memorandum.	
9	Verify a program is in place to confirm and periodically reconfirm the condition and operability of environmental monitoring systems when present.	Readiness Evaluation Procedure	• Operations Order. • Site Specific Health and Safety Plan. • Source Removal Air Monitoring Plan. • Ambient TSP/PM 10 Air Particulate Sampling High Volume Method, Procedure No., AP, In: Air Quality Procedures Manual No. 4-21000-AIR-001, October 1, 1991.	
10	Verify that the administrative record has been established.	CERCLA, RFCA paragraph 284 and 285	• Interview with Jan Robbins (X2679), Administrative Records. • RMRS Records Overview (training material), RMRS Administrative Procedures (esp. RM-06.04), Laura Tyler - x4580.	
11	Verify there is a RCRA closure procedure as required.	RCRA Part B Permit; CHWR Part 264-Subpart G	• Final Proposed Action Memorandum.	
12	Verify that the regulatory agencies have been properly notified of all operations and required regulatory permits have been issued/modified.	RFCA Part 8, note paragraphs 65 and 66	• Final Proposed Action Memorandum.	
13	Verify that all Site required permits are obtained i.e.: • Soil disturbance • Confined Space Entry • Welding • Treatment • Temporary Structures	HSP Manual, OSHA driven	• Soil disturbance permit. • ALARA Job Review. • Confined Space Entry. • Treatment - Final Proposed Action Memorandum.	

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Item	Checklist	Requirement	Supporting Documentation	Results
27	Verify that any required CAQCC Regulation No. 3 APEN (inventory reporting) documents have been submitted to the CDPHE, Air Pollution Control Division. (Note: If pollutant specific inventory thresholds are not tripped, APENs are not required.)	CAQCC Reg No. 3, RFCA Part 9	• Air Pollution Notice (APEN).	
28	Verify that CAA related ARARS have been identified and that project control documents provide for their implementation.	CAQCC Regulations, RFCA Part 9	• Final Proposed Action Memorandum. • Air Pollution Notice (APEN). • Operations Orders.	
29	Verify that asbestos abatement activities are appropriately documented and meet the regulatory requirements of CAQCC Regulation No. 8 Part B. • notification, • permit, • waste storage, and • training requirements.	(CAQCC Reg. No.8, Part B.III.B), CAQCC Reg No. 8 Part B.IIIC.1.a), (CAQCC Reg No. 8 Part B.III.B.1a). (CAQCC Reg No. 8 Part B III(CAQCC Reg No. 8 Part B)..		
30	Verify that the mitigation of fugitive dust emissions generated from project operations is addressed in a control plan.	CAQCC Reg No. 1	• Final Proposed Action Memorandum. • Air Pollution Notice (APEN). • Source Removal Air Monitoring Plan. • Operations Orders. • Site Specific Health and Safety Plan. • ALARA Job Review.	
31	Verify that the RFCA/CERCLA decision documents include the assessment of radionuclide and non-radionuclide air pollutant emissions.	RFCA/CERCLA	• Final Proposed Action Memorandum.	

Item	Checklist	Requirement	Supporting Documentation	Results
39	Verify personnel changes are planned, and measures are in place to ensure new personnel meet all training and qualification requirements for their position.	DOE Order 5480.20A and Training User's Manual	• Site Specific Health and Safety Plan. • List of Qualified Individuals. • Project Specific Training Matrix.	
40	Verify that a training program is in place to ensure that the following personnel have documented evidence of required training to perform work. • contractor • subcontractor • field personnel • management • operational • technical	DOE Order 5480.20A and Training User's Manual	• List of Qualified Individuals. • Project Specific Training Matrix. • Site Specific Health and Safety Plan. • Operations Orders.	
41	Verify that site access control requirements are established, documented, and implemented.	DOE Order 5480.20A and Training User's Manual	• Site Specific Health and Safety Plan. • List of Qualified Individuals. • Project Specific Training Matrix.	
	Quality Assurance			
42	Verify that subcontractors commitments are implemented from documents such as: • SOW • Qualifications • Submittal logs	Best Management Practices	• Statement of Work. • Field Implementation Plan. • Site Specific Health And Safety Plan.	

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Item	Checklist	Requirement	Supporting Documentation	Results
43	Verify a process is in place that quality records generated by RFETS contractors and subcontractors are maintained and dispositioned to provide evidence of organization, functions, policies, decisions, procedures, and operations.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(iv); RMRS-QAPD-001, Quality Assurance Program Description, Section 6.4	• Field Implementation Plan. • Quality Assurance Program Description, RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Records Management Guidance for Records Sources, 1-V41-RM-001, Revision 0, Effective Date July 2, 1996. • Records Identification, Generation and Transmittal, RM-06.02, Revision 0, Effective Date May 28, 1997. • Statement of Work.	
44	Verify that the administrative record is managed properly.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(iv); RMRS-QAPD-001, Quality Assurance Program Description, Section 6.4	• Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Records Management Guidance for Records Sources, 1-V41-RM-001, Revision 0, Effective Date July 2, 1996. • CERCLA Administrative Record Program, 1-F78-ER-ARP.001, Revision 1, Effective Date July 31, 1997. • Preparation and Control of RMRS Documents, QA-05.01, Revision 0, Effective Date February 19, 1997. • Records Identification, Generation and Transmittal, RM-06.02, Revision 0, Effective Date May 28, 1997Administrative Record Document Identification and Transmittal, RM-06.04, Revision 0, Effective Date July 31, 1997.	
45	Verify that building ownership and responsibility is transferred to D&D and documented.	DOE Order 5700.6C Criterion #1 Best Management Practices	• Signed MOU	

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Item	Checklist	Requirement	Supporting Documentation	Results
46	Verify that activities are controlled by procedures/plans.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(2)(I); AI:JG:05078, AMEC ERE Minimum Core Elements; RMRS-QAPD-001, Quality Assurance Program Description, Section 6.5	• Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Conduct of Operations, 1-31000-COOP-001, Revision 0, Effective Date July 15, 1992. • Standing, Shift, and Operations Orders, 1-G58-COOP-013, Revision 0, Effective Date August 15, 1994. • Site Documents Requirements Manual, MAN-001-SDRM, Revision 1, Effective date March 5, 1998. • Field Implementation Plan. • Operations Order. • Air Monitoring Plan. • Sampling and Analysis Plan. • Operations Review Committee Charter, OPS-DIR-005, Revision 0, Effective Date June 9, 1997. • Statement of Work. • Final Work Plan. • Sampling Analysis Plan.	
47	Verify that the project management has conducted a readiness assessment of the proposed activities.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(3)(I)	• Completed RMRS Readiness Assessment Checklist.	

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Item	Checklist	Requirement	Supporting Documentation	Results
48	Verify that quality assurance was involved in planning, and project execution, and independent review was utilized to ensure accuracy and correctness of project approach, plans, documents and activities.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(3)(ii); RMRS-QAPD-001, Quality Assurance Program Description, Section 4	• Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • QA Review of RMRS Documents, RMRS-QA-05.02, Revision 0, Effective Date November 21, 1997. • Operations Order. • Sampling and Analysis Plan. • ALARA Job Review. • Field Implementation Plan. • Quality Assurance Report. • Final Work Plan.	
49	Verify that project management tools are in place. • Document list • Schedule • Action/commitment list, etc.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(2)(i)	• Schedule. • Action List. • Operations Order. • Weekly and monthly PATS reports.	
50	Verify project action items are tracked to completion.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(2)(i)	• Action List. • Site Corrective Action Requirements, 1-MAN-012-SCARM, Revision 0, August 15, 1997. • Corrective Action, RMRS-QA-03.01, Revision 1, Effective Date November 30, 1998. • Weekly and monthly PATS reports.	

Item	Checklist	Requirement	Supporting Documentation	Results
51	Verify organizational structure and responsibilities and authorities of each position are clearly defined and communicated to project personnel.	Doe Order 5700.6C, Quality Assurance Requirements, (c)(1)(i)	• Operations Order. • Safety and Environmental Stewardship Directive, OPS-DIR-001, Revision 2, Effective Date August 8, 1997. • Sampling and Analysis Plan. • Site Specific Health and Safety Plan. • Final Work Plan.	
52	Verify interfaces with supporting organizations, oversight personnel, and regulators are clearly defined and understood.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(i)	• Operations Order.	
53	Verify programs and procedures are in place for sampling activities.	RMRS-QAPD-001, Quality Assurance Program Description, Section 6.5.3	• Sampling and Analysis Plan. • Sampling Analysis Plan. • Operations Orders.	
54	Verify that a program/process is in place for approving laboratories performing sampling analysis.	RMRS-QAPD-001, Quality Assurance Program Description, Section 6.5.3	• Procurement Manual.	
55	Verify there are procedures in place for data verification and validation.	RMRS-QAPD-001, Quality Assurance Program Description, Section 6.5.3	• Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Verification and Validation Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, February 13, 1998. • Analytical Services General Guidelines for Data Verification and Validation, DA-GR01-v1. • Sampling and Analysis Plan.	

Item	Checklist	Requirement	Supporting Documentation	Results
56	Verify a process has been established and documented to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor.	Doe Order 5700.6C, Quality Assurance Requirements, (c)(1)(iii); AI:JG:05078, AMEC ERE Minimum Core Elements	• Site Corrective Action Requirements, 1-MAN-012-SCARM, Revision 0, August 15, 1997. • Corrective Action Process, 3-X31-CAP-001, Revision 0, August 15, 1997. • Plant Action Tracking System, 1-P04-PATS-16.00, Revision 2, October 1, 1997. • Data Analysis and Trending, 1-E93-ADM-16.18, Revision 1, August 15, 1997. • Cause Analysis Requirements Manual, MAN-062-Cause Analysis, Revision 1, April 15, 1997. • Site Lessons Learned/Generic Implications Requirements Manual, 1-MAN-017-LLGI-RM, Revision 0, August 15, 1997. • Corrective Action, RMRS-QA-03.01, Revision 1, Effective Date November 30, 1997. • Management Assessments, RMRS-QA-09.01, Revision 2, Effective Date November 1, 1997. • Independent Assessments, RMRS-QA-10.01, Revision 0, Effective Date November 18, 1996. • Conduct of Surveillances, RMRS-QA-10.02, Revision 0, Effective Date January 15, 1998. • Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Statement of Work. • Comment resolution sheets and project meetings.	

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Item	Checklist	Requirement	Supporting Documentation	Results
57	Verify that the process to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor has been implemented and results documented.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(iii)	• Surveillance Report. • Assessment. • Lessons Learned/Corrective Actions Matrix. • Quality Assurance Status Report. • Field Implementation Plan. • RMRS Environmental Annual Management Assessment Schedule. • Project Fact Finding Meeting, Internal Report.	
58	Verify that findings from previous T-1 project assessments are closed.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(iii)	• Surveillance Report. • Assessment. • Lessons Learned/Corrective Actions Matrix. • RMRS Quality Assurance Status Report. • Project Fact Finding Meeting, Internal Report.	Not applicable.
59	Verify that functions, assignment, and reporting relationships are clearly defined, documented, and effectively implemented with line management responsibility of control of safety.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(i); AI:JG:05078, AMEC ERE Minimum Core Elements	• Operations Order. • Safety and Environmental Stewardship Directive, OPS-DIR-001, Revision 2, Effective Date August 8, 1997. • Site Specific Health and Safety Plan.	
60	Verify that historic preservation requirements have been addressed. • Skyline photographs • Cultural objects encountered • Historical objects encountered	Best Management Practices	• Environmental Assessment.	
61	Verify that lessons learned and generic implications from this project will be generated.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(1)(iii); Kaiser-Hill Quality Assurance Program, Section 7.1.3.2	• Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Revision 1, Effective Date January 1, 1997. • Site Lessons Learned/Generic Implications Requirements Manual, 1-MAN-017-LLGI-RM, Revision 0, August 15, 1997. • Operations Order.	

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Item	Checklist	Requirement	Supporting Documentation	Results
62	Verify that quality assurance element are in place for the gamma spectrometry and alpha spectrometry programs.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(2)(i); RMRS-QAPD-001, Quality Assurance Program Description, Section 6.5		Not applicable.
63	Verify that equipment used for inspection and testing are calibrated and maintained. Verify that acceptance and performance criteria are established.	DOE Order 5700.6C, Quality Assurance Requirements, (c)(2)(iv); RMRS-QAPD-001, Quality Assurance Program Description, Section 6.4	• Sampling and Analysis Plan. • Ambient Air Monitoring. • Site Specific Health and Safety Plan.	
	Authorization Basis			
64	Verify that work planning documents/basis of estimate correctly identified magnitude of hazards and level of authorization basis.	ISM	• Safety Analysis (ASA). • Project Management Plan.	
65	Verify work planning documentation correctly identify hazards and authorization basis.	ISM	• Site Specific Health and Safety Plan. • Safety Analysis (ASA).	
66	Verify that the authorization basis is defined, and has appropriate approvals.	ISM/DOE STD-5502	• Site Specific Health and Safety Plan. Safety Analysis (ASA).	
67	Confirm that USQD process has been used, as necessary, for a nuclear facility or activity.	NSM	• Nuclear Safety Technical Report Safety Analysis.	Not applicable.
	Management			
68	Verify a Work Authorization Document has been developed and approved, including any required Baseline Change Proposals, which must be approved before work commences.	I-MAN-016-ISM, Chap. 1	• Signed cover page to PBS. (If PBS doesn't do it, who will?)	
69	Verify that the activity is on the Master Activity List (MAL).	I-MAN-016-ISM, Chap. 1		

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Item	Checklist	Requirement	Supporting Documentation	Results
	Verify that the activity is on the Readiness Determination List (RDL)	1-MAN-040-RDM	•	
	Verify that the activity has undergone the Activity Screening Process (ASP)	PRO-R32-ADM-02.38	•	
70	Verify that funding has been approved and allocated.	1-MAN-016-ISM, Chap. 1	• Signed cover page to PBS.	
71	Verify implementation and effectiveness of Integrated Safety Management (ISM) principles. 1. Define the Scope of work 2. Identify and Analyze the Hazard 3. Identify and Implement Controls 4. Perform the Work 5. Provide Feedback	1-MAN-016-ISM	• Documentation of ISMS training for project staff. • Comparative Matrix - Lessons Learned and Corrective Actions. • Safety Analysis for Individual Hazardous Substance Site (IHSS). • Site Specific Health and Safety Plan. • ALARA Job Review. • IWCP. • Conduct of Operations procedure 1-31000-COOP-011, Rev. 0, 10/27/92, Pre-Evolution Briefings.	
72	Verify defense in depth from safety analyses is embedded in procedures, processes, and equipment configuration.	1-MAN-016-ISM, Chap. 3; 1-31000-COOP-001, Para. 5.1.8	• Site Specific Health and Safety Plan. • Safety Analysis. • ALARA Job Review. • Field Implementation Plan. • Job Specific RWPs. • IWCP. • Operations Orders. • Sampling and Analysis Plan.	

Item	Checklist	Requirement	Supporting Documentation	Results
73	Verify decisions that involve critical safety factors or regulatory limits (from SA, HASP, PAM, etc.) will involve appropriate manager(s) and/or regulator(s).	1-MAN-016-ISM, Chap. 4	• Final Proposed Action Memorandum. • Site Specific Health and Safety Plan. • Document files contain comment resolution forms and agency/regulator comments and response to comments, therewith. • Safety Analysis. • Fact Finding Meeting Minutes.	
74	Verify managers have established expectations of performance that clearly recognize safety as the overriding priority.	1-MAN-016-ISM, Chap. 4; 1-31000-COOP-001, Para. 5.1.1	• Project Expectations Document. • RMRS Ops-Dir-001, Safety and Environmental Stewardship Directive. • Site Specific Health and Safety Plan.	
75	Verify that there is a clear and agreed upon set of criteria to measure project success.	DOE Order 5700.6C, Criterion 3; 1-31000-COOP-001, Para. 5.1.10	• Rating Plans. • Performance Measures. • Safety.	
76	Verify managers frequently monitor and influence personnel performance by direct observations of work activities and training.	1-MAN-016-ISM, Chap. 5; DOE 5700.6C, Criterion 9	• Field Observations. • Documented Management walk-downs.	
77	Verify lessons learned from previous similar projects have been considered and implemented	1-MAN-016-ISM, Chap. 4; DOE 5700.6C, Criterion 3; 1-MAN-017-LLGI-RM	• Comparative Matrix - Lessons Learned and Corrective Action. • Project Expectations. • Project Training Plan.	
78	Verify there is a process in place to report operational problems and events, investigate and identify causes, and corrective actions are implemented in a timely manner to prevent recurrence.	1-MAN-016-ISM, Chap. 5	• Occurrence Reporting ADM 16.01. • RMRS-QA-03.01. Corrective Action. • Fact Finding Meeting Minutes. • RMRS Ops-Dir-001, Safety and Environmental Stewardship Directive.	

Item	Checklist	Requirement	Supporting Documentation	Results
79	Verify management has established policies relative to field decision-making, procedure use and adherence, and unexpected conditions.	1-MAN-016-ISM, Chap. 4	• Project Expectations Document. • Project Training Plan. • RMRS Ops-Dir-001, Safety and Environmental Stewardship Directive. • Site Specific Health and Safety Plan.	
80	Verify changes to equipment, procedures, and processes are planned and implemented systematically	1-MAN-016-ISM, Chap. 4	• QA-05.01, "Preparation and Control of RMRS Documents". • DC-06.01, "Document Control Plan". • Operations Order. • Communication to workers through change notices, briefings, training, pre-evolution briefings, and health and safety toolbox and plan-of-the-day meetings.	
81	Verify priorities for daily activities are clearly communicated to affected personnel.	1-MAN-016-ISM, Chap. 4	• Health and safety toolbox and plan-of-the-day (POD) meetings and weekly ER PODs. • Operations Order. • Conduct of Operations procedure 1-31000-COOP-011, Rev. 0, 10/27/92, Pre-Evolution Briefings.	
82	Verify personnel with stop work authority are identified and workers are aware of who has stop work authority	DOE 5700.6C, Criterion 3	• RMRS Ops-Dir-001, Safety and Environmental Stewardship Directive. • Site Specific Health and Safety Plan. • Operations Order. • Field Implementation Plan. • Project Expectations Document.	
	Engineering and D&D			
83	Verify management and technical support is readily available at all times to field supervisors.	Best management practices in support of D&D	• Operations Order. • Field Implementation Plan.	
84	Verify that safeguard and security issues have been addressed.	Best management practices in support of D&D	• Operations Order. • TID with NMDTR per Nuclear Material Safeguards Manual and Waste Packaging Requirements.	Not applicable.

Item	Checklist	Requirement	Supporting Documentation	Results
85	Verify that Integrated Work Control Program (IWCP) work package has been developed and approved.	DOE Orders 4330.4B & 5700.6C; COEM DES 210	• IWCP.	
86	Verify that all referenced documents in the IWCP have been developed and approved.	DOE Orders 4330.4B & 5700.6C; COEM DES 210	• All referenced documents in the IWCP are approved and controlled.	
87	Verify that freeze protection issues have been addressed.	Best management practices in support of D&D		Not applicable.
88	Verify that a systematic review of applicable DOE Orders has been performed, any nonconformance have been identified, documented via NCR, and schedules for gaining compliance have been justified in writing and formally approved, or waivers granted.	DOE Orders 4330.4B & 5700.6C; COEM DES 210	• Environmental Readiness Checklist. • Final Proposed Action Memorandum.	
89	Verify that resource allocation has been established to provide sufficient numbers of qualified personnel, and adequate facilities and equipment are available to ensure operational support services are adequate for safe operations.	DOE Order 5700.6C	• Project LOQI.	
90	Verify that there is a traffic plan.	Best management practice in support of D&D	• Field Implementation Plan.	Not applicable.
91	Verify emergency equipment access.	DOE Order 151.1; Site Emergency Plan EPLAN97	• Site Specific Health and Safety Plan. • Emergency Response Drill Program.	
92	Verify that hydrogen generation concerns are addressed.	Best management practice in support of D&D	• Site Specific Health and Safety Plan. • Activity Control Envelope (ACE). • Safety Analysis.	Not applicable.
93	Verify that system isolation and lock out tag out are defined and implemented.	1-31000-COOP-001	• Site Specific Health and Safety Plan. • Lock out tag out briefing.	
94	Verify that Davis Bacon determination has been made.	1-31000-COOP-001	• Documentation resides in project files.	

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Item	Checklist	Requirement	Supporting Documentation	Results
95	Verify that drills/dry runs will be conducted and documented to simulate the proposed activities.	DOE Order 151.1; Site Emergency Plan EPLAN97	• Project schedule and emergency response drill program.	Not applicable.
96	Verify there is adequate storage for waste prior to shipment.	1-M12-WO-4034 1-D99-WO-1100 1-T93-TRAFFIC-110	• Field Implementation Plan.	
97	Verify that any temporary structures such as tents, tanks and sheds are constructed in accordance with all applicable regulations.	COEM DES 210	• Health and Safety Plan. • Work Plan. • IWCP.	
98	Verify any classified objects encountered are dealt with appropriately.	1-31000-COOP-001	• Field Implementation Plan. • Site Specific Health and Safety Plan.	Not applicable.
	Fire Protection			
99	Verify that fire protection requirements have been met.	DOE Orders 420.1,440.1, and 1066 NFPA Standards 1, 101, 102, 780, & 110	• Fire Hazard Analysis. • Site Specific Health and Safety Plan. • Field Implementation Plan.	
100	Verify that the proper industry standards and DOE orders were used to verify fire protection requirements.	DOE Orders 420.1,440.1, and 1066 RFFO Fire Protection Program Execution Guide	• Fire Hazard Analysis. • Site Specific Health and Safety Plan.	
101	Verify all fire hazards were identified.	DOE Orders 420.1, and 440.1 Fire Protection Engineering Manual (FPEM-007)	• Safety Analysis. • Site Specific Health and Safety Plan. • Field Implementation Plan.	

Item	Checklist	Requirement	Supporting Documentation	Results
102	Verify that there exist provisions within the project for implementation of pertinent aspects of the site fire protection program. • Fire Hazard Analysis • Hazard Specific Combustible Control Program • Adequate fire protection facilities and equipment • Personnel allocation • Planned compensatory measures • Provisions in IWCP for appropriate fire hazards controls • Worker training • Life Safety Inspections • Interface established with Fire Protection Engineering and Fire Department	Fire Protection Program Plan (96-FP-PROG-0010), Health and Safety Practices (HSP) 34.01, 34.02, and 34.06	• Safety Analysis. • Site Specific Health and Safety Plan. • Fire Hazard Analysis. • List of Qualified Individuals. • Project Specific Training Matrix. • Field Implementation Plan.	
	Radiation Protection			
103	Verify adequate preparations have been completed for response to potential radiological problems/spills. (Supplies, worker knowledge of actions, etc.)	AMEC Environmental Readiness Evaluation Procedure	• Site Specific Health and Safety Plan. • ALARA Job Review. • Job Specific RWPs. • RFETS Radiological Control Manual. • 1-N08-HSP-21.04, Rev. 0, 6/28/95 Emergency Response and Spill Control. • Air Monitoring Plan.	
104	Verify sufficient radiological control personnel have been assigned to support the project needs.	AMEC Environmental Readiness Evaluation Procedure.	• List of Qualified Individuals. • Project Specific Training Matrix including backup personnel.	
105	Verify supporting documentation (ALARA review, RWP's) have been adequately completed. Radiological control requirements are incorporated into project work procedures.	AMEC Environmental Readiness Evaluation Procedure	• ALARA Job Review. • Job Specific RWPs. • IWCP.	

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Item	Checklist	Requirement	Supporting Documentation	Results
106	Verify personnel assigned to the project understand expected radiation and contamination levels and controls are in place to keep personnel informed of actual levels during work.	RFETS Radcon Manual	• Pre-Evolution Briefing. • Health and Safety Tailgate Meeting and Plan of the Day.	
107	Verify dry-runs/ mock-ups are sufficient in scope and demonstrate readiness to proceed with planned operations.	AMEC Environmental Readiness Evaluation Procedure	• Interviews and review of dry-run/mock-up, and emergency response drill.	Not applicable.
108	Review a selection of completed project radiological surveys for completeness, accuracy, usability, and timelines of supervisory review.	RFETS Radcon Manual	• Radiological surveys.	
109	Verify contamination control schemes for surface and airborne radioactive contamination are sufficient for planned evolutions.	RFETS Radcon Manual	• ALARA Job Review. • Job Specific RWPs.	
	Conduct of Operations			
110	Verify workers are aware of expectations for procedure adherence, and what to do when procedures do not work as written. These include: • When procedures must physically be at the jobsite. • When procedures are to used as guidance, followed step-by-step, or need to be signed off when steps are completed • Actions to be taken when procedures conflict, are inadequate for the intended tasks, or when unexpected results occur. Actions to be taken when procedure activity is interrupted prior to completion. • Authorization to deviate from written procedures during an emergency if necessary to protect personnel and equipment, and the controls needed to deviate.	1-31000-COOP-001, Para. 5.1.7; 1-31000-COOP-001, Para. 5.3.2	• Project Expectations.	

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Item	Checklist	Requirement	Supporting Documentation	Results
111	Verify field personnel are aware of available indications and instrumentation, and their implications on operations and safety. Workers display a questioning attitude when anomalies are encountered.	1-31000-COOP-001, Para. 5.4.4	• Interviews and Operations Orders. • Site Specific Health and Safety Plan.	
112	Verify operators are familiar with immediate actions to be taken in response to unusual indications and alarms, and how to place equipment/materials in a safe condition when conditions warrant.	1-31000-COOP-001, Para. 5.4.4	• Interviews and mock-ups	
113	Verify measures are taken to minimize potential distractions in the work areas. Access to enclosed areas is restricted to authorized personnel	1-31000-COOP-001, Para. 5.3.3	• Operations Order. • Site Specific Health and Safety Plan.	Not applicable.
114	Verify procedures implement controls provided for in SA, HASP, PAM, etc. The following items are included (rad con holds and controls are covered in Rad section):	1-31000-COOP-001, Para. 5.4.5; 1-31000-COOP-001, Para. 5.7.3	• Final Proposed Action Memorandum. • Field Implementation Plan. • Site Specific Health and Safety Plan. • Operations Orders. • Sampling and Analysis Plan.	
115	Verify procedures are clear and concise and contain sufficient information for users to understand and perform their activities. Level of detail is adequate to accommodate the most inexperienced, qualified worker. Human factor considerations have been implemented in procedures.	1-31000-COOP-001, Para. 5.3.2	• Operations Orders. • Field Implementation Plan. • Site Specific Health and Safety Plan. • Sampling and Analysis Plan.	
116	Verify worker aids (signs, etc.) are consistent with procedure guidance.	1-31000-COOP-001, Para. 5.3.7	• Operations Orders and Operator Aids Book.	
117	Verify procedure changes receive the appropriate level of technical review and approval before they are implemented in the field. These reviews consider potential impacts on the safety basis.	1-31000-COOP-001, Para. 5.3.2; 1-31000-COOP-001, Para. 5.7.3	• Project Expectations. • Operations Order. • QA-05.01, Preparation and Control of RMRS Documents. • DC-06.01, Document Control Program.	

Item	Checklist	Requirement	Supporting Documentation	Results
118	Verify personnel are familiar with how to initiate procedure changes.	1-31000-COOP-001, Para. 5.3.2; 1-31000-COOP-001, Para. 5.7.4	• Project Expectations • Operations Order. • QA-05.01, Preparation and Control of RMRS Documents. • DC-06.01, Document Control Program.	
119	Verify measures are in place to accurately transfer information during turnovers.	1-31000-COOP-001, Para. 5.3.4	• Operations Orders.	Not applicable.
120	Verify a method is in place to communicate procedure changes and other important information to field personnel	1-31000-COOP-001, Para. 5.3.2; 1-31000-COOP-001, Para. 5.7.4	• Site Specific Health and Safety Plan. • Use of Health and Safety Tailgate Meetings, Pre-Evolution Briefings, "Required Reading".	
121	Verify expectations for oral and hand communications are established that will ensure communications are clear, concise, and understandable. Appropriate feedback is used to verify information when appropriate	1-31000-COOP-001, Para. 5.3.6	• Site Specific Health and Safety Plan. • Use of Health and Safety Tailgate Meetings.	
122	Verify the expected contents of the trench, and the approximate location of items within the trench will be communicated to workers.	1-31000-COOP-001, Para. 5.3.3	• Site Specific Health and Safety Plan. • Pre-evolutionary Briefing.	Not applicable.
123	Verify methods exist to identify and prioritize equipment deficiencies to permit restoration to full capability in a timely manner.	1-31000-COOP-001, Para. 5.4.11	• Site Specific Health and Safety Plan. • Equipment Checklists. • Ambient Air Monitoring. • Inspection of Emergency Response and Safety Equipment.	
124	Verify the work area is maintained in a clean and orderly condition.	1-31000-COOP-001, Para. 5.3.3	• Site Specific Health and Safety Plan. • Health and Safety Tailgate Meetings.	
125	Verify equipment is checked to ensure non-sparking tools to be used as appropriate.	T-1 Safety Analysis	• Field Implementation Plan.	Not applicable.
	Health and Safety			

Item	Checklist	Requirement	Supporting Documentation	Results
126	Verify direct and open means of raising safety concerns and identifying problems is available to all personnel.		• Site Specific Health and Safety Plan. • Health and Safety Tailgate Meetings and Pre-Evolution Briefings. • RMRS Ops-Dir-001, Safety and Environmental Stewardship Directive. • RFETS Radiological Control Manual, Rev. 2, 6/1/96.	
127	Verify that documentation is in place that describes the "safety envelope" of the project (i.e. Health and Safety Plan). The document(s) should characterize the hazards/risks associated with the project and identify mitigative measures that protect workers, the public, and the environment from those hazards/risks. Safety systems essential to worker and public safety should be in place to maintain control over the project.	CFR 1910.120(b) CFR 1926.65	• Safety Analysis. • Site Specific Health and Safety Plan. • ALARA Job Review. • Job Specific RWPs. • APEN document. • Operations Orders.	
128	Verify that Activity Hazard Analyses (AHAs) have been written and adequately address project hazards, risks, and associated preventative measures.	DOE Order 440.1A Worker Protection Management for DOE Federal and Contractor Employees	• Site Specific Health and Safety Plan.	
129	Verify that controls are in place that adequately mitigate identified hazards and risks.	CFR 1910.120 CFR 1926.65	• Site Specific Health and Safety Plan. • ALARA Job Review. • Job Specific RWPs. • IWCP. • Operations Orders.	
130	Verify that emergency response actions, including escape routes and contingency plans, have been established and communicated to employees.	CFR 1910.120(l) CFR 1926.65	• Site Specific Health and Safety Plan. • Visitor Orientation. • Pre-Evolution Briefing, Daily Tailgate meeting. • Emergency Drill prior to start of field work.	

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Item	Checklist	Requirement	Supporting Documentation	Results
131	Verify that there are processes in place to ensure that work is performed with no significant safety incidents or "near misses". Planned assessments and/or oversight of work practices give confidence that work is controlled and performed safely.	ISMS Manual (1-MAN-016-ISM), BMP	• Site Specific Health and Safety Plan. • Quality Assurance audits.	
132	Verify that adequate personnel and equipment are allocated to address safety, programmatic, and operational considerations.	CFR 1910.120, BMP CFR 1926.65	• List of Qualified Individuals (LOQI). • Project Specific Training Matrix. • Site Specific Health and Safety Plan.	
133	Verify that a program is in place to periodically confirm the condition and operability of safety systems (breathing air, fall protection, communications, monitoring equipment, etc.).	CFR 1910.120, .146, Subpart F; CFR 1926 Subparts L, M CFR 1926.65	• Site Specific Health and Safety Plan. • Operations Orders.	

ATTACHMENT 5

SUMMARY REPORT OF RCRA CLOSURE ACTIVITIES FOR UNITS 21 AND 48 AND CLOSURE CERTIFICATION REPORT ON CONCRETE PADS AT RCRA UNITS 21 AND 48

Summary Report of

RCRA Closure Activities for

Units 21 and 48 in Building 788

U.S. Department of Energy
Rocky Flats Environmental Technology Site
EPA ID No. CO7890010526

Confirmed and Approved by:

V. Guthrie, Project Manager, RMRS — 10/4/99 Date

Prepared by:

R. E. Fiehweg, Environmental Compliance, RMRS — 10/4/99 Date

1.0 PURPOSE

This report documents the closure or partial closure of RCRA Units 21 and 48 in accordance with the approved Closure Description Document (RF/RMRS 98-288) (the "CDD"), and the Sampling and Analysis Plan (RF/RMRS-99-319) (the "SAP"). Concrete slabs remain in a RCRA Stable condition.

2.0 DESCRIPTION OF MAJOR CLOSURE ACTIVITIES

2.1 Removal of Waste, Treatment Equipment and Storage Building

As provided in the CDD, the waste in units 21 and 48 was removed, packaged as hazardous waste and shipped as described in Table 1, below. The process equipment, the pumphouse, the clarifier tank and the building were dismantled, packaged as low-level waste or recycle metal and shipped as indicated in Table 1. The concrete slabs that formed the foundations for the building, the clarifier and the pumphouse remain in place, and will be addressed during environmental restoration. Due to radiological concerns, the building and clarifier slabs have been covered with either 80 mil plastic and soil or multiple coats of fixative.

Table 1 Summary of Waste Generation and Disposal

WASTE CATEGORY	VOLUME GENERATED, Cubic Meters	DESTINATION
Low Level Waste (LLW)	258.3	Nevada Test Site
Low Level Mixed Waste (LLM)	31.0	Envirocare
Hazardous (HAZ)	0.6	Envirocare
Recycled Metal	439	GTS Duratek
Sanitary Waste (NON)	57.9	Front Range Landfill

2.2 Closure of the Concrete Slabs

The concrete slabs for the building and the pumphouse were washed several times with a machine which brushed the slabs. Following the brushing, the slabs were rinsed using distilled water. The building slab was divided into 43 uniform grid areas from which a total of seven areas were sampled. Attachment 1 shows the floor plan of the building and the pumphouse and the grid set-up for sampling. As described in the SAP, five samples provided a 90% upper confidence level that the results would be representative of the entire floor. However, based on historical use, two additional areas – the floor area where the Permacon was located, and the floor area from the southeast door leading to the clarifier tank, a former contaminated area (CA) – were selected for sampling. Sampling results for the building slab, but not the Permacon area or the pumphouse, demonstrate compliance with the closure performance standards, resulting in clean closure of the building slab, excluding the Permacon area. A summary of the sampling results is included in the professional engineer's certification report, which is attachment 2 to this document.

The former Permacon area and the pumphouse slab were washed and rinsed several times in an attempt to meet closure standards. Because these areas could not meet clean closure standards, the slabs will be addressed during environmental restoration activities. The concrete slab that served as the foundation for the clarifier was not washed because of several areas of known fixed radiological contamination and because of the washing and sampling results for the Permacon area and pumphouse concrete slabs. Loose material has been cleaned up from this

slab and two coatings of fixative have been applied to eliminate the risk of any release into the environment.

This closure report constitutes notification to CDPHE that the closure performance standards were not met as described in the CDD. However, because the unclosed Permacon and clarifier areas have been stabilized, either with a covering of plastic and soil or by the application of fixative, the risk of releasing waste constituents into the environment is negligible. No further action has been taken on the pumphouse slab after removing the building and all equipment and several washings of the concrete slab because remnant contamination on this slab is suspected to have come from contaminated soils in the immediate vicinity of the slab.

3.0 CLOSURE CONFIGURATION

Partial closure is declared for all of the B788 (Unit 21) slab except for the area of the former Permacon. Partial closure for the Pondcrete Processing system (Unit 48) is declared for all former components of the unit except for the 207 clarifier slab and the 308A pumphouse slab. Estimated floor areas are shown in Table 2.

Table 2 Estimated Floor Areas

LOCATION	APPROXIMATE DIMENSIONS, ft. X ft.	APPROXIMATE AREA, sq. ft.
Building 788 Slab	220 X 22.5	5000
Former Permacon Area	47 X 10	470
207 Clarifier Slab	30 X 30	900
308A Pumphouse Slab	10 X 12	120

The total area clean closed is approximately 4530 square feet and the total area that is RCRA Stable is 1490 square feet.

Partial closure is described here to demonstrate that a majority of the area of the former units (75%) has been cleaned and meets closure standards. For practical purposes, however, the entire area will be managed as RCRA Stable to simplify record keeping and to appropriately address the three areas that did not meet closure performance standards. The Site proposes the following steps for unit management under RCRA Stable Configuration:

1. The entire area will be clearly marked as "RCRA Stable",

2. The units will be identified in the Master List of RCRA Hazardous Waste Units at Rocky Flats as "RCRA Stable",

3. The units will be inspected annually to assure that the areas are properly labeled, and

4. Final closure will be deferred until scheduled pursuant to the RFCA budget planning process.

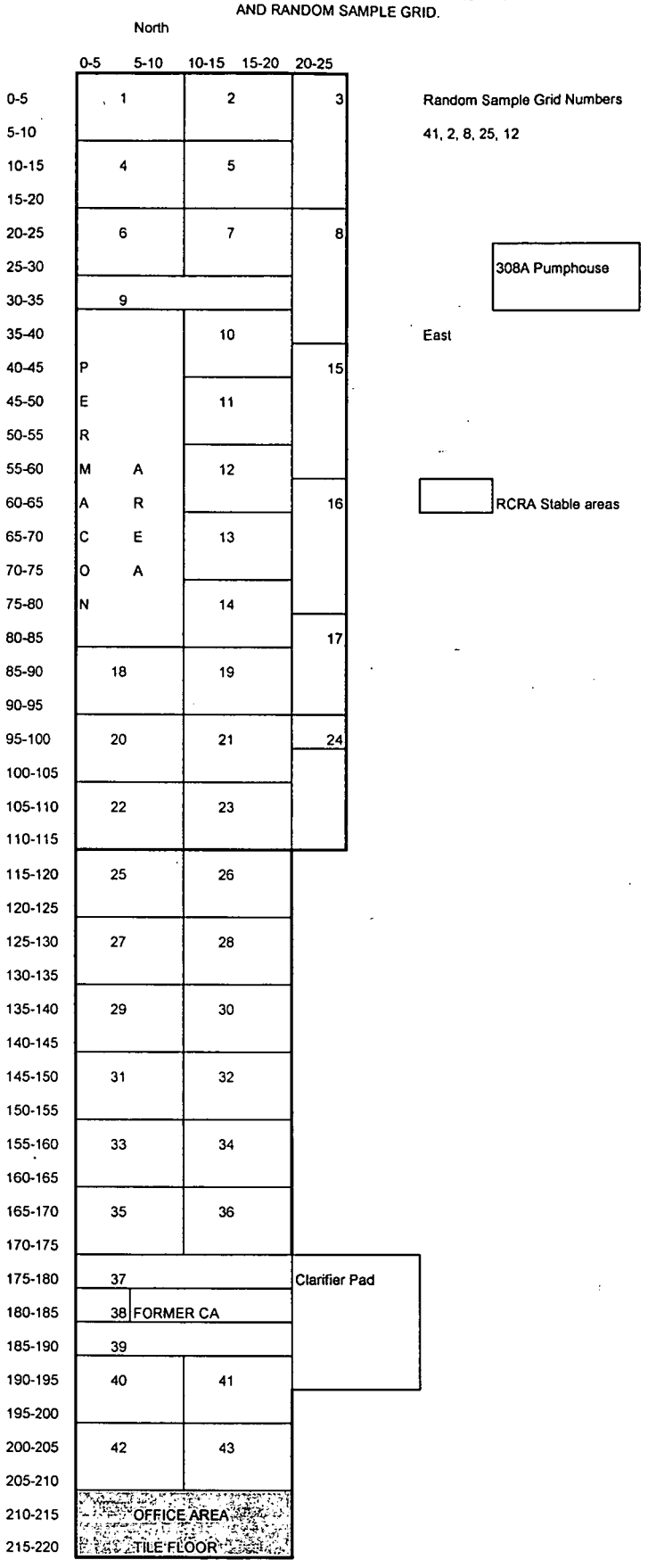
4.0 CONCLUSION

Closure activities for RCRA Units 21 and 48 were conducted as described in the CDD and followed the requirements of the closure plans for permitted units and interim status units. The only deviation from the CDD was that floor washing was not done on the clarifier. The units are now considered RCRA Stable and will be managed as set forth in this report.

ATTACHMENT 1

FLOOR PLAN OF BUILDING 788 AND 308A PUMPHOUSE WITH RCRA STABLE AREAS AND RANDOM SAMPLE GRID

FLOOR PLAN OF BUILDING 788 AND 308A PUMPHOUSE WITH RCRA STABLE AREAS AND RANDOM SAMPLE GRID.



Building Dimensions in Feet
Grid 24 shares one 5ft square with grid 17
Grid 38 shares one 5 ft grid with grid 37 and two grids with grid 39

ATTACHMENT 2

PROFESSIONAL ENGINEER'S CERTIFICATION REPORT

RESOURCE TECHNOLOGIES GROUP, INC.

3900 S. Wadsworth Blvd., Suite 155
Lakewood, Colorado 80235-2205
303-969-8511
FAX 303-989-8188

September 23, 1999

Mr. Robert E. Fiehweg
Rocky Mountain Remediation Services, L.L.C.
Rocky Flats Environmental Technology Site
10808 Highway 93, Unit B
Golden, Colorado 80403-8200

Re: Transmittal
Closure Certification Report for Concrete Pads at RCRA Units 21 and 48
Rocky Flats Environmental Technology Site

Dear Mr. Fiehweg:

Resource Technologies Group, Inc. (RTG) is please to present the Closure Certification Report for Concrete Pads at RCRA Units 21 and 48, in support of the Building 788 Closure Project. The Closure Certification Report is being submitted in one loose-leaf copy, complete with Professional Engineer certification, to facilitate incorporation into the Closure Summary Report for Building 788. Please let me know if additional certified copies are needed.

RTG appreciates the opportunity to assist RMRS with this important project. Feel free to call me on extension 6694 with any questions or comments on the Closure Certification Report.

Sincerely,

RESOURCE TECHNOLOGIES GROUP, INC.

Paul E. Pigeon, PE
Senior Engineer

cc:
C. L Guthrie, RMRS
R. C. Gransee, RMRS
K. M. Kelly, RTG

Enclosure
PEP/

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CLOSURE CERTIFICATION REPORT
CONCRETE PADS AT RCRA UNITS 21 AND 48

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

Revision 0
September 23, 1999

Prepared for: Rocky Mountain Remediation Services, L.L.C.
Rocky Flats Environmental Technology Site
10808 Highway 93, Unit B
Golden, Colorado 80403-8200

Prepared by: Resource Technologies Group, Inc.
3900 South Wadsworth Blvd., Suite 155
Lakewood, Colorado 80235-2205

CLOSURE CERTIFICATION REPORT
CONCRETE PADS AT RCRA UNITS 21 AND 48
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

1.0 INTRODUCTION

As part of the closure project for Rocky Flats Environmental Technology Site (RFETS) Building 788 (B788), RCRA closure activities were conducted for RCRA Units 21 and 48, which are located within and surrounding B788. Unit 21 is a permitted storage unit located in B788, while Unit 48 is an interim status unit consisting of pondcrete solidification process equipment, including the clarifier and the pump transfer station at B308A. A decontamination strategy and Sampling and Analysis Plan (SAP) (RF/RMRS-99-319) were developed to clean close the RCRA unit concrete pads at B788, the clarifier and B308A. The decontamination and sampling field activities were conducted by Rocky Mountain Remediation Services, LLC (RMRS) from March through July 1999 and were observed by an independent professional engineer (hereinafter, the PE).

This report summarizes the field activities, identifying deviations from the SAP, presents sample analysis results and their statistical analysis, and provides a closure certification statement for RCRA Units 21 and 48.

2.0 SAMPLING AND ANALYSIS ACTIVITIES

Decontamination and sampling of the B788 and B308A concrete pads were accomplished in stages, with the activities performed in subsequent stages based upon analytical results for samples from the previous stage. Concurrently, the RCRA water sample parameters analyzed for samples from subsequent stages were pared down based on results from previous samples at the same locations.

Initially, the B788 South pad and the B308A pump station pad were decontaminated and sampled in accordance with the SAP, Sections 4.1 through 4.3. The South pad samples included the random sample grids Nos. 25, and 41 and the biased sampling location at a former contaminated area (CA). The former CA was small enough to include its entire floor area in the sampling. The RCRA water sample analysis results (discussed in Section 3.1) indicated resampling for B788 grid 25 and B308A. The South pad of B788 was subjected to a second round of decontamination and grid 25 was resampled in accordance with the SAP. B308A was not addressed again until after the pump station piping and building were removed.

Concurrently with the resampling of grid 25, the B788 North pad was decontaminated and sampled in accordance with the SAP. The North pad samples included the random sample grid Nos. 2, 8 and 12 and the biased sampling location in the Permacon. This stage was not initiated until overhead sludge and

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decant piping were removed above the North pad and a spray-on acrylic latex fixative was applied to the walls of the Permacon. The Permacon sample was collected from the center of the room because floor staining and pitting were evenly distributed across the floor area. Based on the RCRA sample analysis results, the Permacon was subjected to a second round of decontamination and sampling in accordance with the SAP.

At this point, additional decontamination and sampling were still indicated by the RCRA water metals results for the Permacon and B308A. Based upon the high metals concentrations in the B308A RCRA water sample and the fact that two rounds of decontamination of the Permacon in accordance with the SAP were unsuccessful, the next round incorporated a different decontamination method. High-pressure cold water spray decontamination was used and then the Permacon and B308A were resampled in accordance with the SAP. As presented in Section 3.1, these final samples also exceeded clean closure action levels.

Based upon the results for the Permacon and B308A pump station, and the observed condition of the clarifier pad, the clarifier pad was not decontaminated in accordance with the SAP. Loose material including frayed, peeling sections of an existing concrete sealant layer were scraped off and removed and a spray-on acrylic latex fixative was applied.

3.0 RCRA WATER SAMPLE RESULTS AND STATISTICAL ANALYSIS

3.1 Constituents of Concern in RCRA Samples

Analytical results for RCRA constituents of concern at Units 21 and 48 are listed on Table 3-1, including cyanide, nine metals and one volatile organic compound. Only 2-butanone was detected and so it is the only organic listed. Sample numbers listed include the assigned RIN code followed by the event sample number. Sampling dates and "resample" labels are included to indicate the stages of decontamination and resampling. Tier II ground water action levels from the Rocky Flats Cleanup Agreement (RFCA) are the clean closure action levels and achievement or exceedance of the action levels are marked "Pass" or "Fail", respectively.

The results show that, with the exception of the B308A samples, exceedances of the action levels occurred only for cadmium. In the final B308A sample, collected on July 12, 1999, exceedances occurred for cadmium, chromium and lead.

Clean closure was achieved for the former CA on the South pad of B788, while clean closure failed for the Permacon and the B308A pump station. The results for the random sampled area of the B788 pad are addressed in Section 3.2, while the Permacon, B308A and clarifier pads are covered in Section 4.0.

3.2 Statistical Analysis of Random Sample Results

The analytical results in Table 3-1 from grids 2, 8, 12, 25 (resample) and 41 were statistically evaluated together in accordance with SAP Section 4.3 to assess whether clean closure was achieved for the B788 pad exclusive of the biased sample locations. This evaluation included the results from grid 12, which individually exceeded the action level for cadmium by 0.0014 mg/l. The mean cadmium concentration calculated from these five samples was 0.0027 mg/l, which is below the closure action level of 0.005 mg/l. However, the EPA G-4 sampling model (EPA, 1994) indicates that, to achieve 90% confidence that the mean is less than the clean closure action level for the RCRA water samples, a minimum of six samples would be required for the evaluation of cadmium.

Six samples were acquired to achieve the minimum as defined by the EPA G-4 model. In addition to the five random samples, the biased sample from the former CA was used in an attempt to conservatively represent contamination levels on the B788 concrete pad. Because the sixth sample was biased conservatively, it is included in the data set representative of the entire 788 concrete pad surface, excluding the walled Permacon. Other inputs into the EPA G-4 model were also conservative, including use of Student's t-statistics in lieu of z-scores and use of the arithmetic mean as the lower bound of the gray region. The beta error was set at 10% (to achieve 90% confidence); this to control the error (to 10%) of concluding the pad is RCRA-clean when it really is not. Alpha error was set at 20%, as a greater error was tolerated for concluding the pad is contaminated when, in fact, it is RCRA-clean.

The other RCRA constituents of concern were also evaluated for the necessary number of samples to assess 90% confidence, with none requiring more than two samples. A summary of the inputs and outputs from the statistical evaluation of 90% confidence is on Table 3-2.

Having established the adequacy of the number of samples taken, as described above, the 90% Upper Confidence Limit (UCL) was computed for each constituent of concern. The UCLs were computed consistent with EPA Guidance (EPA, 1993) and are displayed on Table 3-2. Because the metals of interest exhibit both normal and log-normal frequencies in background water matrices (DOE, 1993), the 90% UCL was computed assuming both normality and log-normality (i.e., the UCL was also evaluated via log-normal transformations when assuming log-normality). A t-statistic was selected for 90% confidence under the normal distribution assumption and 5 degrees of freedom. An H statistic was selected for the log-normal distribution and was specifically selected for each parameter based on the variance of the data set. None of the 90% UCLs exceeded the clean closure action level. The 90% UCL closest to an applicable clean closure action level was cadmium with a UCL range of 0.004 to 0.005 mg/l for normal and log-normal distribution assumptions, respectively, compared to the action level of 0.005 mg/l.

The statistical analysis showed that adequate sample quantities were collected and upper limits on the mean concentration values for all detected constituents of concern did not exceed the clean closure action levels. The decision criteria in SAP Section 4.3 for RCRA clean closure were met for the B788 concrete pad excluding the Permacon.

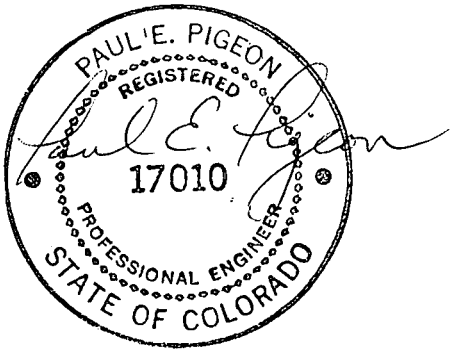
4.0 CLOSURE CERTIFICATION

The decontamination and sampling activities described in Section 2.0 were observed by the PE and were conducted in accordance with the SAP. Changes in decontamination technique and analyte lists during the latter stages of the closure activities were reviewed by the PE and found to be reasonable and appropriate to the objective of achieving RCRA clean closure of the concrete pads. In preparing this closure certification, the PE reviewed the analytical data generated and statistical analyses performed by RMRS. As attested by the PE seal and signature below, RCRA clean closure was achieved in accordance with the decision criteria in the SAP for the B788 concrete pad excluding the Permacon.

As attested by the PE seal and signature below, a RCRA stable condition was achieved for the concrete pads that make up the rest of the two RCRA units, by taking measures to prevent the release of waste constituents to the environment. The B788 Permacon area and B308A pump station pads were rendered RCRA stable by the chemical cleaning and high pressure spray methods employed for decontamination prior to collection of RCRA water samples. The clarifier pad was rendered RCRA stable by application of an acrylic latex spray-on fixative.

The concrete pads for RCRA Units 21 and 48, which are the remaining structural features for these units, will be deferred to Environmental Restoration (ER) for remediation.

PE seal and signature attesting to closure certification statements:



Paul E. Pigeon, PE
Colorado PE No. 17010

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5.0 REFERENCES

EPA, 1993, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Publication 9285.708I

EPA, 1994, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Final, September.

DOE, 1993, *Background Geochemical Characterization Report*, Rocky Flats Environmental Technology Site (RFETS), Golden, Colorado.

Gilbert, R.O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

RF/RMRS-99-319, *Sampling and Analysis Plan for Concrete Pads at RCRA Units 21 and 48*, Revision 0, March 3, 1999.

5.0 REFERENCES

EPA, 1993, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Publication 9285.708I

EPA, 1994, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Final, September.

DOE, 1993, *Background Geochemical Characterization Report*, Rocky Flats Environmental Technology Site (RFETS), Golden, Colorado.

Gilbert, R.O., 1987, *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

RF/RMRS-99-319, *Sampling and Analysis Plan for Concrete Pads at RCRA Units 21 and 48*, Revision 0, March 3, 1999.

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Table 3-1

RCRA CLOSURE WATER SAMPLE RESULTS
RCRA UNITS 21 AND 48

Sample Number (RIN-Event)		99A5904-001		99A5904-002		99A5904-003		99A5904-004		99A6873-001 (Resample)		99A6873-002		99A6873-003		99A6873-004		99A6873-006		99A7628-001 (Resample)		99A8357-001 (Resample)		99A8357-005 (Resample)
Collection Date		3/22/99		3/24/99		3/24/99		3/24/99		4/27/99		4/27/99		4/27/99		4/27/99		4/27/99		5/27/99		7/12/99		7/12/99
Constituents of Concern	Action Level[1]	Pump Station B308A		B788 Grid # 41		B788 Former CA		B788 Grid #25		B788 Grid #25		B788 Grid #2		B788 Grid #8		B788 Grid #12		B788 Permacon		B788 Permacon		B788 Permacon		Pump Station B308A
Cyanide (CN)	0.2	0.046 PASS	U	0.005 PASS	U	0.005 PASS	U	0.005 PASS		Not Sampled	U	0.005 PASS		0.007 PASS	U	0.005 PASS	U	0.005 PASS		Not Sampled		Not Sampled		Not Sampled
Arsenic (As)	0.05	1.26 FAIL		0.0029 PASS		0.0031 PASS		0.0046 PASS		0.0013 PASS		0.0048 PASS		0.0045 PASS		0.002 PASS		0.0106 PASS		0.0133 PASS		0.0067 PASS		0.0301 PASS
Barium (Ba)	2	2.28 FAIL		0.0138 PASS		0.014 PASS		0.0392 PASS		0.0125 PASS		0.0043 PASS		0.0073 PASS		0.0073 PASS		0.02 PASS		0.0544 PASS		0.066 PASS		0.158 PASS
Cadmium (Cd)	0.005	2.13 FAIL		0.0021 PASS		0.0037 PASS		0.0195 FAIL		0.0019 PASS		0.0011 PASS		0.0022 PASS		0.0064 FAIL		0.0303 FAIL		0.0686 FAIL		0.0213 FAIL		0.213 FAIL
Chromium (Cr)	0.1	2.4 FAIL		0.0056 PASS		0.0082 PASS		0.0212 PASS		0.0047 PASS		0.0044 PASS		0.0082 PASS		0.0095 PASS		0.027 PASS		0.0548 PASS		0.0291 PASS		0.155 FAIL
Lead (Pb)	0.015	11.7 FAIL		0.006 PASS		0.0073 PASS		0.0273 FAIL		0.003 PASS		0.002 PASS		0.0046 PASS		0.0046 PASS		0.0145 PASS		0.029 FAIL		0.0125 PASS		0.522 FAIL
Mercury (Hg)	0.002	0.0137 FAIL	U	0.0001 PASS		0.0001 PASS		0.00017 PASS	U	0.0001 PASS	U	0.0001 PASS	U	0.0001 PASS	U	0.0001 PASS		0.00013 PASS		0.00018 PASS	U	0.0001 PASS	U	0.0001 PASS
Nickel (Ni)	0.14	0.653 FAIL		0.0066 PASS		0.009 PASS		0.0157 PASS		0.002 PASS		0.0088 PASS		0.0096 PASS		0.0046 PASS		0.0161 PASS		0.0338 PASS		0.0144 PASS		0.0936 PASS
Selenium (Se)	0.05	0.0141 PASS	U	0.0009 PASS		0.0012 PASS	U	0.0009 PASS	U	0.0012 PASS	U	0.0012 PASS	U	0.0012 PASS	U	0.0012 PASS	U	0.0012 PASS		0.0016 PASS	U	0.00002 PASS	U	0.00092 PASS
Silver (Ag)	0.183	0.09 PASS		0.00046 PASS		0.0005 PASS		0.0012 PASS	U	0.00035 PASS	U	0.00035 PASS	U	0.00035 PASS	U	0.00035 PASS		0.00071 PASS		0.0018 PASS		0.00067 PASS		0.0014 PASS
2-Butanone	21.9	J 0.009 PASS	J	0.002 PASS	J	0.002 PASS	J	0.002 PASS		Not Sampled	U	0.01 PASS	U	0.01 PASS	U	0.01 PASS	U	0.001 PASS		Not Sampled		Not Sampled		Not Sampled

[1] RFCA Table 2 Ground Water Action Levels Tier 2.

NOTES:
1. All concentrations in mg/L.
2. Qualifiers: J = Estimated value below instrument detection limit.
U = Not detected.

Table 3-2

STATISTICAL ANALYSIS OF RCRA WATER SAMPLES
BUILDING 788 CONCRETE PAD

RCRA Water Samples	Cyanide (CN)		Arsenic (As)		Barium (Ba)		Cadmium (Cd)		Chromium (Cr)		Lead (Pb)		Mercury (Hg)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		2-butanone	
	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log
Grid 41	5	1.609	2.9	1.065	13.8	2.625	2.1	0.742	5.6	1.723	6	1.792	0.1	-2.303	6.6	1.887	0.9	-0.105	0.46	-0.777	2	0.693
Grid 25 (resample)	5	1.609	1.3	0.262	12.5	2.526	1.9	0.642	4.7	1.548	3	1.099	0.1	-2.303	2	0.693	1.2	0.182	0.35	-1.050	2	0.693
Grid 2	5	1.609	4.8	1.569	4.3	1.459	1.1	0.095	4.4	1.482	2	0.693	0.1	-2.303	8.8	2.175	1.2	0.182	0.35	-1.050	10	2.303
Grid 8	7	1.946	4.5	1.504	7.3	1.988	2.2	0.788	8.2	2.104	4.6	1.526	0.1	-2.303	9.6	2.262	1.2	0.182	0.35	-1.050	10	2.303
Grid 12	5	1.609	2	0.693	7.3	1.988	6.4	1.856	9.5	2.251	4.6	1.526	0.1	-2.303	4.6	1.526	1.2	0.182	0.35	-1.050	10	2.303
Former CA	5	1.609	3.1	1.131	14	2.639	3.7	1.308	8.2	2.104	7.3	1.988	0.1	-2.303	9	2.197	1.2	0.182	0.5	-0.693	2	0.693
Statistical Parameters for 90% Confidence																						
Assumed Distribution	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans
Standard Deviation		0.14		0.50		0.47		0.61		0.33		0.47		0.00		0.60		0.12		0.16		0.88
(Std Dev)[2]	0.7	0.02	1.9	0.2	16.7	0.2	3.7	0.4	4.6	0.1	3.7	0.2	0.00	0.00	8.9	0.4	0.01	0.01	0.005	0.03	19.2	0.8
Number of Samples (N)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Student's t statistic (0.2) Alpha	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Student's t statistic (0.1) Beta	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476
H statistic[1]		1.48		1.8		1.8		1.977		1.67		1.8		1.42		1.9		1.41		1.48		2.5
Mean Concentration (ppb)	5.333	1.666	3.1	1.037	9.867	2.204	2.9	0.905	6.767	1.869	4.583	1.437	0.1	-2.303	6.767	1.790	1.15	0.134	0.393	-0.945	6	1.498
Action Level[2] (ppb)	200	5.298	50	3.912	2000	7.601	5	1.609	100	4.605	15	2.708	2	0.693	140	4.942	50	3.912	183	5.209	21900	9.994
Minimum Number of Samples for 90% Confidence Limit[3]	1	1	1	1	1	1	6	5	1	1	1	2	1	1	1	1	1	1	1	1	1	1
90% Upper Confidence Limit (UCL)[4] (ppb)	6	6	4	5	12	15	4	5	8	9	6	7	0	0	9	12	1	1	0	0	9	18

[1] Table A10 (Gilbert, 1987)
[2] RFCA Table 2 - Ground Water Action Levels - Tier 2
[3] EPA G-4, Appendix C (EPA, 1993)
[4] Calculated using Beta t-statistic for normal and H statistic for log-normal.

ATTACHMENT 6

ASBESTOS ABATEMENT COMPLETION DOCUMENTATION, DEMOLITION NOTIFICATIONS AND APPROVALS

DEMOLITION NOTIFICATION -- Colorado

This form requires 2 signatures and a $55 fee. Incomplete applications will be returned. Questions? Please call 692-3179.

Specify type of materials used in the construction of the building/structure, and amount, in tons:

concrete: 4 cu. m	brick: NA	steel: 126 cu.m	wood: 28 cu. m	other: 65 cu. m

DEMOLITION CONTRACTOR:

Foster Wheeler Environmental Corp
Company Name

P.O. Box 464
Street

Golden CO 80402
City State Zip Code

(303) 966-2952
Phone

DEMOLITION SITE:

Bldgs 788 and 308A/Clarifier 207A
Building Name (if applicable) Year Built

State Hwy 93 and Cactus Avenue
Rocky Flats Environ. Technology Site
Street

Golden, CO (Jefferson) 80402
City County Zip Code

Start date: March '99 Completion date: May 30,
Proposed demolition start and completion dates

BUILDING OWNER:

Department of Energy (DOE)
Rocky Flats Environ. Technology Site
Name

State Hwy 93 and Cactus Avenue
Street

Golden CO 80402
City State Zip Code

(303) 966-7000
Phone

CERTIFIED ASBESTOS INSPECTOR:

Michael N. Schluterbusch
Name (Please print. Note: signature is required at bottom of this form.*)

2070 S. Stuart Denver CO 8021
Address City State Zip

505-80-5651 May 30, 1999
Colorado Certificate # Expiration Date

(303) 742-7883 10/13/98
Phone Date(s) of inspection

* I certify that I possess current AHERA and state of Colorado certification as an Asbestos Building Inspector. I also certify that I have inspected the building to be demolished, as listed in the Demolition Site block, above, sampled all suspect materials (in accordance with AHERA) and had them analyzed for the presence of asbestos, and to the best of my ability have determined that (☒ appropriate box and sign in pen):

☐	no asbestos exists anywhere in the building
☑	the only ACM left in the building is VAT and/or tar-impregnated roofing felt
☐	all ACM that I found has been completely removed from this building

Asbestos Building Inspector signature: Michael N Schluterbusch

I certify that all refrigerants from air conditioning/refrigeration appliances have been properly recovered in accordance with AQCC Regulation No. 15 (For information on CFC requirements call 692-3177.)

☐ Building Owner or ☒ Contractor

Signature: [signature] Date: 2/11/99

STATE OF COLORADO

Bill Owens, Governor
Jane E. Norton, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
Located in Glendale, Colorado

Laboratory and Radiation Services Division
8100 Lowry Blvd.
Denver CO 80220-6928
(303) 692-3090

http://www.cdphe.state.co.us

Colorado Department
of Public Health
and Environment

DEMOLITION APPROVAL NOTICE

This approval notice is granted subject to Colorado Air Quality Control Commission Regulation No. 8, Part B, adopted September 19, 1996 and effective November 30, 1996, and the Air Quality Control Act C.R.S. 1982 & 1995 (25-7-101 and 25-7-501 *et seq*). This notice signifies that the structure was inspected for asbestos and CFCs and the demolition contractor has properly notified the Colorado Department of Public Health pursuant to Regulation No. 8, Part B. **THE ORIGINAL APPROVAL NOTICE MUST BE POSTED ON SITE AT ALL TIMES.**

As a contractor, you may have to obtain other demolition licenses and permits, depending on the requirements of the county and municipality in which the work is being performed. The Colorado Department of Public Health, Air Pollution Control Division strongly suggests that you check with county and municipal authorities inorder to determine any other local building/permitting requirements that must be met.

This approval notice is valid from **03/01/1999** through **05/30/1999**
The actual scheduled work dates are from **03/01/1999** through **05/30/1999**

This approval notice has been issued to:

FOSTER WHEELER ENV. CORP.
P.O. BOX 464
GOLDEN, CO 80402

For the location specified below:

BLDGS. 788 & 308A/CLARIF 207A
STATE HWY 93 & CACTUS AVE.
GOLDEN
JEFFERSON COUNTY

Asbestos Building Inspector: MICHAEL N. SCHLUTERBUSCH
State Certification Number: [redacted] Expiration: 05/30/1999
Phone Number: (303) 742-[redacted]
Inspection Date: 10/13/1998

Approval Issued on: 02/24/1999
Record Number: 2072
Notice Number: 99JE1256D-
Amount Paid: $55
Check Number: 2392

Issued by: _____

Immediately notify the Asbestos Unit of project modifications by fax at 782-0278 andthe appropriate county health department by fax. Project modifications include changes in the scope of work or the scheduled work dates.

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ATTACHMENT 7

CERTIFICATES OF DESTRUCTION

CERTIFICATE OF DESTRUCTION FOR GOVERNMENT PROPERTY

PROPERTY CONTROL NUMBER 0013012400

SERIAL NUMBER N/A BLDG. 308A

MANUFACTURER NAME N/A

MODEL NUMBER N/A PERMANENT BUILDING

THE FOLLOWING ARE EXCLUSIONS NOT AUTHORIZED FOR DESTRUCTION USING THIS CERTIFICATE:

Nuclear Materials: (41 CFR 101-42.1102-4)
Upholstered or Cloth-covered items: (41 CFR 101-42&44.108.5)
Batteries: (41 CFR 42)
Gas Cylinders (41 CFR 101-42.1107-7)
Flags: (41 CFR 101-45.1&46202)
Chemicals: (41 CFR-42.1102-7)
Weapons: (41 CFR 101.309-8)
Safes: (41 CFR 101-42.1102-1)
Software: (41 CFR 101-42)

Destruction of the above must be requested under separate letter to the RFCSS, Property Administrator

Under the provision of the Federal Acquisition Regulation, Paragraph 45.611 (2) the property described above has been destroyed under contract RM907377RR2, dated March 3, 1999.

VERN GUTHRIE, Project Manager
Print Name and Title of Destruction Official

Signature of Property Custodian or Destruction Official

9/16/99
Date

Rissa C. Gransee, Sr. Secretary
Print Name and Title of Disinterested Witness

Signature of Disinterested Witness

9/16/99
Date

Norm Snyder
Print Name and Title of Property Management

Signature of Property Administrator

9/16/99
Date

CERTIFICATE OF DESTRUCTION FOR GOVERNMENT PROPERTY

PROPERTY CONTROL NUMBER 0013018400

SERIAL NUMBER N/A BLDG. 788

MANUFACTURER NAME N/A

MODEL NUMBER N/A PERMANENT BUILDING

THE FOLLOWING ARE EXCLUSIONS NOT AUTHORIZED FOR DESTRUCTION USING THIS CERTIFICATE:

Nuclear Materials: (41 CFR 101-42.1102-4)
Upholstered or Cloth-covered items: (41 CFR 101-42&44.108.5)
Batteries: (41 CFR 42)
Gas Cylinders (41 CFR 101-42.1107-7)
Flags: (41 CFR 101-45.1&46202)
Chemicals: (41 CFR-42.1102-7)
Weapons: (41 CFR 101.309-8)
Safes: (41 CFR 101-42.1102-1)
Software: (41 CFR 101-42)

Destruction of the above must be requested under separate letter to the RFCSS, Property Administrator

Under the provision of the Federal Acquisition Regulation, Paragraph 45.611 (2) the property described above has been destroyed under contract RM907377RR2, dated March 3, 1999.

VERN GUTHRIE, Project Manager
Print Name and Title of Destruction Official

Signature of Property Custodian or Destruction Official — Date 9/16/99

Russa C. Gransee, Sr. Secretary
Print Name and Title of Disinterested Witness

Russa C Gransee
Signature of Disinterested Witness — Date 9/16/99

Norma Sparks
Print Name and Title of Property Management

Signature of Property Administrator — Date 9/16/99

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ATTACHMENT 8

WASTE GENERATION SUMMARY REPORT

D&D WSRIC Process Closure Waste Summary
Process # 788-2
Building 788 & Clarifier Closure Project

The RMRS Closure Projects group has completed work on the Building 788 Cluster Decommissioning Project, which includes the 207 Clarifier Tank. Work on this project was performed in two phases by separate AE/C/CM's. The first phase included the Solar Pond Debris Removal under IWCP MA78EG-21 by Denver West Remediation Corporation (DWRC). Activities included the removal of excess equipment and debris in and around the solar pond area, and waste was generated from 1/21/99 thru 6/4/99. The second phase was performed by Foster Wheeler Environmental Corporation (FWEC), and included dismantling the 207A Clarifier and surrounding structure, demolishing Building 788, the 308A Pumphouse, the Pugmill and all ancillary treatment equipment to the slabs. Waste was generated in this phase from 3/26/99 through 7/22/99.

The D&D WSRIC book was used to document the characterization of all waste generated by this project. These waste outputs will be added to the existing Building 788 WSRIC book under process number 788-2. Characterization of wastes was based upon various project documents, including the Site Hazard Assessment Report, Waste Management Plan, Closure Description Document, Interim Measures and Interim Remedial Action (IM/IRA) studies, analytical sampling, process knowledge, and interviews with past Solar Pond employees.

The purpose of this document is to provide a summary of the waste that was generated from these activities. The following wastes streams are captured in this report. Low Level Waste and Low Level Asbestos Waste that is being shipped to NTS. Low Level Mixed Waste that will be shipped to Envirocare of Utah. Recycled Metal that was shipped to the GTS Duratek facility in Bear Creek, Tennessee. Industrial Sanitary Waste that was shipped to Front Range Landfill in Erie, Colorado. Other Miscellaneous waste items.

Totals are listed below for the number of waste packages for each type of waste, and the corresponding volume of waste. These are broken down into waste generated by DWRC in the Debris cleanup phase, and FWEC in the Demolition phase. The last part of this report is a breakdown of a description of each WSRIC waste output generated by this project.

Waste Type	Volume in cubic meters
Radioactive Waste Streams	**289.3 cu. m**
Straight Low Level Waste (LLW)	**255.1 cu. m**
DWRC – 32 full crates, 1 55 gal drum	101.5 cu. m
FWEC – 33 full crates, 10 half crates, 1 IP-1 cargo	153.6 cu. m
Low Level Waste w/Asbestos (LLW)	**3.2 cu. m**
FWEC – 1 full crate	3.2 cu. m

Waste Type		Volume in cubic meters
Low Level Mixed Waste (LLM)		**31.0 cu. m**
DWRC – 5 full crates, 1 cement mixer		18.3 cu. m
FWEC – 4 full crates, 1 10 gal drum		12.7 cu. m
Non-Radioactive Waste Streams		**58.5 cu. m**
Hazardous Waste (HAZ)		**0.6 cu. m**
DWRC – 1 55 gal drum, 1 15 gal drum		0.3 cu. m
FWEC – 4 boxes		0.3 cu. m
Non-Hazardous Waste (NON)		**0.5 cu. m**
DWRC – 2 55 gal drums		0.4 cu. m
FWEC – 2 boxes		0.1 cu. m
Industrial Sanitary Waste (NON)	**5.46 tons**	**57.4 cu. m**
FWEC – 4 rolloffs	5.46 tons	57.4 cu. m
Material to Recycle		**439 cu. m**
Scrap Metal to Metal Melt	**96.91 tons**	**438 cu. m**
DWRC – 4 Sealands	23.25 tons	113 cu. m
FWEC – 12 Sealands	73.66 tons	325 cu. m
Lead Acid Batteries		**1.1 cu. m**
DWRC – 1 pallet		1.0 cu. m
FWEC – 1 box		0.1 cu. m
Circuit boards		**0.1 cu. m**
FWEC – 1 box		0.1 cu. m

Number of containers shipped from Building 788

Rolloffs	4 Total –	0 Rad,	4 Non-Rad
Sealands	16 Total –	16 Rad,	0 Non-Rad
Cargos	1 Total –	1 Rad,	0 Non-Rad
Full Crates	75 Total –	75 Rad,	0 Non-Rad
Half Crates	10 Total –	10 Rad,	0 Non-Rad
55 gallon drums	4 Total –	1 Rad,	3 Non-Rad
Cement Mixer	1 Total –	1 Rad	0 Non-Rad
Odd Size Containers	11 Total –	2 Rad,	9 Non-Rad

A summary of the waste generated during this Closure Project is listed below. It is arranged in D&D WSRIC process/output number sequence, which segregates waste types. These processes are as follows:

D&D-1	Non-Hazardous and Non-Radioactive (NON)
D&D-2	Hazardous and Non-Radioactive (HAZ)
D&D-3	Non-Hazardous and Radioactive (LLW)
D&D-4	Hazardous and Radioactive (LLM)

Non-Hazardous & Non-Radioactive Waste Outputs (NON)

D&D-1-6 Used Oil 1950 (2) 55 Gallon Drums
WGI # GI9907880976A
This output consists of assorted used oils, hydraulic oil, and diesel fuel that were collected from various pieces of equipment that were wasted. It has been characterized by process knowledge since used oil is not regulated as a hazardous waste when burned for energy recovery. Sampling was performed to provide a fingerprint and gross alpha/beta analysis.

D&D-1-31 Ballasts and Capacitors (Non-PCB) 1971 1 Box
WGI# None Required – Consolidated into another drum at Bldg. 666
This waste consisted of 4 ballasts removed from light fixtures in room 101, 102, and the Permacon. They are characterized by process knowledge and visual inspection shows they have "NO-PCB's" markings on them.

D&D-1-32 Ballasts and Capacitors (PCB) 1973 1 Box
WGI# None Required – Consolidated into another drum at Bldg. 666
This waste consisted of 5 ballasts removed from light fixtures in room 101, 102, and the Permacon. They are characterized by process knowledge and visual inspection, an do not have "NO-PCB's" markings on them

D&D-1-45 Industrial Sanitary Waste in Rolloff Bin 1920 4 Rolloffs
WGI# None Required – Sent to Front Range Landfill
This waste stream consisted of the fiberglass insulation inside the walls of Bldg. 788, and the plywood that reinforced the roof on the north half of Bldg. 788, which was not exposed to the exterior elements. Also included was wire that was removed from conduit inside Bldg. 788. The insulation exposed to the interior of the building was not included.

Hazardous & Non-Radioactive Waste Outputs (HAZ)

D&D-2-10 Lead Acid Batteries 1980 1 Pallet
WGI# None Required – Sent to Unit 5004 for Recycling
This output consisted of 1 forklift battery and assorted smaller size batteries removed from equipment and emergency lighting. They are characterized by process knowledge, and are exempted from hazardous waste regulations since they are being recycled.

D&D-2-15 Circuit Boards 1480 1 Box
WGI# None Required – Sent to Unit 5004 for Recycling
This waste output consists of 5 circuit boards removed from exit signs and equipment. They are characterized by process knowledge, and are exempted from hazardous waste regulations since they are being recycled

D&D-2-16 Incandescent Bulbs 1938 1 Box
WGI# None Required – Sent to Unit 2291 for Crushing
This waste consists of light bulbs removed from equipment and storage shelves. They are characterized by process knowledge and RFETS Environmental guidance.

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D&D-2-17 Mercury Switches 1325 1 Box
WGI# None Required – Consolidated w/ Mercury Waste at Unit 2205
This output consists of 3 ampules of mercury from a thermostat switch. They are characterized by process knowledge.

D&D-2-21 Fluorescent Bulbs 1928 1 Box
WGI# None Required – Sent to Unit 2291 for Packaging
This waste stream consisted of four foot light tubes removed from fixtures in room 101, 102 and the Permacon. They are characterized by process knowledge and RFETS Environmental guidance.

D&D-2-22 Sodium & Mercury Vapor Bulbs 1937 1 Box
WGI# None Required – Sent to Unit 2291 for Packaging
This output consisted of light bulbs removed from exterior light fixtures, including security lighting around the Solar Ponds. They are characterized by process knowledge and RFETS Environmental guidance.

D&D-2-23 Water 1945 (1) 15 Gal. Drum
WGI# None Required – Sent to LWO in Bldg. 374 for Processing
This waste stream was liquid removed from the contaminated forklift battery, and was characterized by process knowledge as containing lead. Fingerprint and gross alpha/beta analysis was performed. The liquid was added to the tank going to Bldg. 374.

D&D-2-36 Misc. Organic Liquid 1529 (1) 55 Gal. Drum
WGI# GI9807880951A
This waste consists of a drum of gasoline collected from equipment around the Solar Pond area. It was characterized by process knowledge and RFETS Environmental guidance. Fingerprint and gross alpha/beta analaysis were performed.

Non-Hazardous & Radioactive Waste Outputs (LLW)

D&D-3-3 Dry Combustibles 861 38 full crates
WGI# GI9807880961A 1 half crate
This waste output consisted of pallets, telephone poles, PPE, trash, railroad ties, stairs, and other combustible material. Process knowledge was used to characterize this waste.

D&D-3-9 Plastic 863 3 full crates, partial of 13 full
WGI# GI9807881116A, GI987880964B, GI997881596B crates & 1 cargo (SCO)
This waste stream includes sheets of plastic, tarps, and hoses that were not used to transport pondsludge. This plastic and rubber was characterized using process knowledge and through interviews with Solar Pond personnel.

D&D-3-11 Light Metal 480 12 Sealands & partial
WGI# GI987880964B, GI997881596B of 12 full crates & 1 cargo (SCO)
This waste stream consists of metal items from the building and surrounding area. The Sealands were sent to GTS Duratek for metal melt so they technically were not considered waste. The cargo and crates were filled with metal SCO items, and were characterized by process knowledge.

D&D-3-19 Glass 440 Partial of 1 cargo (SCO)
WGI# GI987880964B, GI997881596B
This output consists of windows, insulators, and light covers that were removed from the building ant telephone poles. They are characterized by process knowledge.

D&D-3-22 Used Oil 529 (1) 55 Gal. Drum
WGI# None Available
This output is characterized by process knowledge since used oil is not regulated as a hazardous waste when burned for energy recovery. Sampling was performed to provide a fingerprint and gross alpha/beta analysis. This waste was collected from pieces of equipment found around the Solar Pond area. It included oil and hydraulic fluid. This drum was presumed to be non-radioactive until analysis proved it to be slightly above the free releasable limits.

D&D-3-24 Pipe Insulation 438 Partial of 2 full crates (SCO)
WGI# GI987880964B
This output consists of pipe insulation that was left on sections of PVC piping. This pipeline was installed to transfer water to Bldg. 910, but was never operational, so this waste was characterized by process knowledge as non-hazardous.

D&D-3-69 Concrete 374 3 full crates, 9 half crates
WGI# GI9807880965A
This waste stream consists of concrete and cinderblocks from the Solar Pond area, with most of it coming from the ramp near the pugmill. It is characterized by process knowledge.

D&D-3-75 Drywall & Wall Insulation 438 7 full crates
WGI# GI997881118A
This output consisted of drywall removed from the Permacon and rooms 101 & 102, and pipe insulation and wall insulation that was exposed to the working area. It is characterized by process knowledge.

D&D-3-76 Non-Friable Asbestos Insulation 438 1 full crate
WGI# GI980788966A
This waste output was the 2 porches from the T788 trailer. They were characterized by analytical data to be non-friable asbestos contaminated.

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D&D-3-95 HEPA Filters 490 1 full crate
WGI# GI997881117A
This waste was generated when the filter plenum was stripped out of the Permacon. The filters were not used since the last changeout according to process knowledge from Solar Pond workers.

Hazardous and Radioactive Waste Outputs (LLM)

D&D-4-3 Dry Combustibles 851 1 full crate
WGI# GI9807880962A
This output consists of wood from stairs that were used to access the Solar Ponds. Only the wood that had been below the water line was considered hazardous. It is characterized by extensive analysis that is documented as part of the pondcrete treatment process

D&D-4-9 Plastic 853 4 partial full crates
WGI# GI9807880963A
This output consists of hoses that were used to transfer pond sludge. It is characterized by extensive analysis that is documented as part of the pondcrete treatment process.

D&D-4-11 Light Metal 480 3 full crates & 4 partial full
WGI# GI9807880963A crates & 1 cement mixer
This output consisted of metal pipes, fittings, flanges, tank pieces, pugmill, and other pieces used to process pondsludge into pondcrete. It is characterized by extensive analysis that is documented as part of the pondcrete treatment process.

D&D-4-21 Lead 321 1 full crate
WGI# GI997881516A
This waste consists of a forklift battery that had the liquid drained out of it. It is hazardous for lead by process knowledge. There was fixed contamination on the battery with large cracks on the top surface, precluding it from being recycled.

D&D-4-47 Wash Water 505 (1) 450 Gal. Tank
WGI# None Required – Sent to LWO in Bldg. 374 for Processing
This waste output consisted of water from the Clarifier Tank, ancillary equipment and piping. It is characterized by extensive analysis that is documented as part of the pondcrete treatment process.

788-NR-01 Paint Chips 532 (1) 10 Gal. Drum
WGI# None Required – Sent to Unit 18.03 for consolidation.
This waste consists of paint chips that were scrapped from the Clarifier slab before a permanent fixative was applied. This was characterized by process knowledge of Pondcrete and Lead based paint.

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BUILDING 788 CLUSTER DEBRIS WASTE TRACKING LOG

1999 Page 1 of 2

RMRS / DWRC Waste Coordinator-Ernie Bentsen Updated 7/30/99

DATE CONTAINER INITIATED	IDC / WFC	CONTAINER NUMBER	DATE CONTAINER FILLED	WASTE DESCRIPTION	WASTE STREAM NUMBER	DATE CONTAINER SHIPPED
1/21/99	861	P04202-05424	02/02/99	Combustibles (wood, PPE)	D&D-3-3	3/16/99
02/02/99	861	P04200-05422	02/02/99	Combustibles (wood, PPE)	D&D-3-3	3/16/99
02/02/99	5001	P04275-05421	02/02/99	SCO (hoses) LLM	D&D-4-9 D&D-4-11	4/21/99
02/02/99	5001	P04201-05423	02/02/99	SCO (hoses) LLW	D&D-3-9 D&D-3-11	3/16/99
02/02/99	1529	N04459-05425	02/09/99	Gasoline	D&D-2-36	4/28/99
02/02/99	1950	G04589-05470	02/09/99	Oil	D&D-1-6	7/14/99
02/04/99	5001	P04203-05430	02/04/99	SCO (hoses & stuff) LLW	D&D-3-9 D&D-3-11	3/16/99
02/04/99	5001	P04272-05431	02/04/99	SCO (hoses & stuff) LLW	D&D-3-9 D&D-3-11	3/16/99
02/04/99	863	P04274-05433	02/04/99	Plastic Sheeting and Tarps	D&D-3-9	3/16/99
02/04/99	861	P04273-05432	02/09/99	Combustibles (wood)	D&D-3-3	3/16/99
02/09/99	5001	P04269-05436	02/09/99	SCO (hoses) LLW	D&D-3-9	3/16/99
02/09/99	5001	P04276-05437	02/09/99	SCO (hoses & metal) LLW	D&D-3-9 D&D-3-11	3/16/99
02/09/99	5001	P04204-05434	02/09/99	SCO (aluminum pipe) LLM	D&D-4-11	4/21/99
02/09/99	5001	P04206-05435	03/09/99	SCO (aluminum pipe & hoses) LLM	D&D-4-9 D&D-4-11	5/6/99
02/09/99	861	P04267-05438	02/09/99	Combustibles (wood & rope)	D&D-3-3	3/16/99
02/10/99	861	P04268-05439	02/24/99	Combustibles (wood & PPE)	D&D-3-3	4/19/99
02/10/99	374	P04270-05440	05/19/99	Cinderblock, Cement	D&D-3-69	6/29/99
02/16/99	5001	P04207-05441	02/16/99	SCO (PVC pipe & stuff) LLW	D&D-3-9 D&D-3-11	3/22/99
02/16/99	438	P04357-05442	02/16/99	Insulation	D&D-3-75	3/22/99
02/16/99	438	P04271-05443	02/16/99	Insulation	D&D-3-75	3/22/99
02/17/99	861	P04205-05444	02/17/99	Combustibles (wood)	D&D-3-3	3/22/99
02/17/99	861	P04208-05445	02/23/99	Combustibles (wood,rope)	D&D-3-3	3/22/99
02/18/99	480	X13026-05446	03/02/99	Recycle Metal, RM2-0009 13,600 lb	D&D-3-11	5/3/99
02/22/99	490	P04199-05448	02/22/99	HEPA Filters	D&D-3-95	3/22/99
02/23/99	5001	P04356-05449	02/24/99	SCO (wire, PVC) LLW	D&D-3-9 D&D-3-11	3/22/99

BUILDING 788 CLUSTER DEBRIS WASTE TRACKING LOG

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RMRS / DWRC Waste Coordinator-Ernie Bentsen Updated 7/30/99

DATE CONTAINER INITIATED	IDC / WFC	CONTAINER NUMBER	DATE CONTAINER FILLED	*WASTE DESCRIPTION*	WASTE STREAM NUMBER	DATE CONTAINER SHIPPED
02/24/99	5001	P04355-05452	03/17/99	SCO (generators, tires, etc,) LLW	D&D-3-9 D&D-3-11	4/19/99
02/25/99	861	P04353-05450	02/25/99	Combustibles (wood)	D&D-3-3	4/19/99
03/02/99	861	P04358-05453	03/02/99	Combustibles (wood)	D&D-3-3	3/22/99
03/03/99	861	P04354-05451	03/03/99	Combustibles (wood)	D&D-3-3	3/22/99
03/02/99	480	X13027-05447	03/03/99	Recycle Metal, RM2-0023 11,300 lb	D&D-3-11	5/3/99
03/03/99	480	X13081-05454	03/08/99	Recycle Metal, RM2-0111 11,000 lb	D&D-3-11	5/4/99
03/08/99	480	X13082-05455	03/16/99	Recycle Metal, RM2-0161 10,600 lb	D&D-3-11	5/4/99
03/09/99	861	P04387-05456	03/09/99	Combustibles (wood)	D&D-3-3	3/22/99
03/09/99	5001	P04388-05457	03/09/99	SCO (pipes & refrigerator)	D&D-3-9 D&D-3-11	4/19/99
03/04/99	861	P04389-05458	03/04/99	Combustibles (wood)	D&D-3-3	4/19/99
03/09/99	851	P04390-05459	03/18/99	Combustibles (wood) LLM	D&D-4-3	4/21/99
03/08/99	321	X13093	03/08/99	Lead Acid Batteries - HOT - packed into crate P04590 & X13591	D&D-4-21	Repacked 6/4/99
03/08/99	1980	X13094	03/08/99	Lead Acid Batteries for Recycle	D&D-2-10	4/6/99
03/18/99	5001	P04302-05462	03/18/99	SCO (air monitors, wire, pipe)	D&D-3-9 D&D-3-11	4/19/99
03/17/99	861	P04305-05463	03/17/99	Combustibles (wood)	D&D-3-3	4/19/99
03/17/99	863	P04308-05464	03/17/99	Plastic	D&D-3-9	4/19/99
03/22/99	861	P04434-05465	03/29/99	Combustibles (wood)	D&D-3-3	4/19/99
03/29/99	5001	P04438-05472	04/28/99	SCO (metal & plastic)	D&D-3-9 D&D-3-11	6/29/99
03/29/99	861	P04439-05473	03/29/99	Combustibles (wood & PPE)	D&D-3-3	4/21/99
03/30/99	1950	G04563-05476	04/27/99	Oil	D&D-1-6	7/14/99
03/30/99	529	G04626-05463	03/30/99	Oil	D&D-3-22	7/19/99
04/27/99	480	X13495-05477	04/27/99	Cement Mixer w/Pondcrete inside	D&D-4-11	4/27/99
06/04/99	1945	X13591-05484	06/04/99	Liquid from Battery - added to Blue Bomber and sent to 374	D&D-2-23	7/15/99
06/04/99	5001	P04590-05506	06/04/99	Battery from Forklift	D&D-4-21	7/28/99

BUILDING 788 CLUSTER DEMO WASTE TRACKING LOG

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RMRS /FWEC Waste Coordinator-Ernie Bentsen Updated 10/05/99

DATE CONTAINER INITIATED	IDC / WFC	CONTAINER NUMBER	DATE CONTAINER FILLED	WASTE DESCRIPTION	WASTE STREAM NUMBER	DATE CONTAINER SHIPPED
03/26/99	438	P04435-05471	03/26/99	Asbestos Insulation	D&D-3-76	04/21/99
03/26/99	861	P04442-05474	03/29/99	Combustibles (wood)	D&D-3-3	04/19/99
04/14/99	861	P04443-05478	04/28/99	Combustibles	D&D-3-3	06/29/99
04/15/99	1971	X13602-05488	06/01/99	4 Non-PCB Ballaasts	D&D-1-31	06/21/99
04/15/99	1973	X13603-05489	06/01/99	5 PCB Ballasts	D&D-1-32	06/21/99
04/19/99	438	P04589-05479	04/19/99	Pipe Insulation & Drywall	D&D-3-75	06/29/99
04/27/99	5001	P04584-05485	05/20/99	SCO (pipes, hoses) LLM	D&D-4-9 D&D-4-11	07/20/99
04/28/99	438	P04585-05486	05/25/99	Insulation	D&D-3-75	06/29/99
05/04/99	5001	X13600-05487	07/1/99	SCO Cargo 14,210 lbs net wt.	D&D-3-9 D&D-3-11 D&D-3-19	07/15/99
05/04/99	1325	X13601-05490	05/04/99	3 Mercury Ampules from Thermostat	D&D-2-17	06/21/99
05/04/99	1480	X13604-05491	05/04/99	5 Circuit Boards for Recycle	D&D-2-15	06/21/99
05/04/99	1980	X13605-05492	05/04/99	6 Lead Acid Batteries for Recycle	D&D-2-10	06/3/99
05/05/99	480	X13587-05480	05/11/99	Recycle Metal, RM2-0201 13,540 lb	D&D-3-11	06/18/99
04/15/99	1928	NA	06/02/99	18 Fluorescent Bulbs	D&D-2-21	06/03/99
04/15/99	1937	NA	06/01/99	Sodium Mercury Bulbs	D&D-2-22	06/03/99
04/19/99	1938	NA	05/25/99	Incandescent Bulbs	D&D-2-16	06/03/99
05/11/99	480	X13588-05481	05/12/99	Recycle Metal, RM2-0200, 8,110 lbs	D&D-3-11	06/18/99
05/12/99	480	X13589-05482	05/17/99	Recycle Metal, RM2-0067, 11,190 lb	D&D-3-11	06/29/99
05/18/88	480	X13590-05483	05/25/99	Recycle Metal, RM2-0143, 15,750 lb	D&D-3-11	06/29/99
05/14/99	861	P04720-05493	05/27/99	Combustibles	D&D-3-3	06/29/99
05/20/99	374	P04587-05494	07/14/99	Concrete	D&D-3-69	08/02/99
05/21/99	5001	P04719-05495	05/27/99	SCO (Pugmill) LLM	D&D-4-11	07/28/99
05/25/99	480	X13767-05496	06/07/99	Recycle Metal, RM2-0030 14,510 lb	D&D-3-11	07/22/99
05/26/99	861	P04728-05502	05/26/99	Combustibles (wood)	D&D-3-3	06/29/99
05/26/99	861	P04725-05500	05/26/99	Combustibles (wood)	D&D-3-3	06/29/99
05/26/99	861	P04726-05501	05/26/99	Combustibles (wood)	D&D-3-3	06/29/99
05/27/99	861	P04722-05503	05/27/99	Combustibles (wood)	D&D-3-3	06/29/99

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BUILDING 788 CLUSTER DEMO WASTE TRACKING LOG

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RMRS / FWEC Waste Coordinator-Ernie Bentsen Updated 10/05/99

DATE CONTAINER INITIATED	IDC / WFC	CONTAINER NUMBER	DATE CONTAINER FILLED	*WASTE DESCRIPTION*	WASTE STREAM NUMBER	DATE CONTAINER SHIPPED
05/27/99	5001	P04727-05504	06/03/99	SCO (Clarifier Pipes) LLM	D&D-4-9 D&D-4-11	07/28/99
06/1/99	861	P04721-05505	06/10/99	Combustibles (PPE & wood)	D&D-3-3	07/20/99
06/07/99	438	P04723-05507	06/07/99	Insulation (drywall)	D&D-3-75	07/20/99
06/07/99	5001	P04724-05508	06/29/99	SCO (pipes & tank)	D&D-4-11	07/28/99
06/08/99	438	P04593-05509	06/09/99	Insulation (drywall)	D&D-3-75	07/20/99
06/08/99	480	X13768-05497	06/09/99	Recycle Metal (RM2-0138) 19,370 lb	D&D-3-11	07/21/99
06/14/99	480	X13769-05498	06/17/99	Recycle Metal (RM2-0080) 12,150 lb	D&D-3-11	07/15 /99
06/15/99	438	P04586-05510	06/16/99	Insulation (fiberglass)	D&D-3-75	07/20/99
06/15/99	861	P04591-05511	06/16/99	Combustibles (PPE & wood)	D&D-3-3	07/20/99
06/17/99	480	X13770-05499	06/17/99	Recycle Metal (RM2-0058) 7,790 lb	D&D-3-11	07/15/99
06/21/99	861	P04592-05512	06/23/99	Telephone Poles	D&D-3-3	07/28/99
06/21/99	480	X14359-05513	06/21/99	Recycle Metal (RM2-0151) 6,080 lb	D&D-3-11	07/21/99
06/21/99	480	X14360-05514	06/21/99	Recycle Metal (RM2-0105) 9,470 lb	D&D-3-11	07/22/99
06/23/99	861	P05088-05517	06/23/99	Telephone Poles	D&D-3-3	08/02/99
06/23/99	861	P05089-05518	06/23/99	Telephone Poles	D&D-3-3	07/28/99
06/23/99	480	X14361-05515	06/30/99	Recycle Metal (RM2-0084) 21,750 lb	D&D-3-11	07/29/99
06/24/99	861	P05087-05519	06/24/99	Telephone Poles	D&D-3-3	07/20/99
06/24/99	861	P05092-05522	06/24/99	Telephone Poles	D&D-3-3	07/20/99
06/24/99	5001	P05091-05521	06/24/99	SCO (pipe w/insulation)	D&D-3-9 D&D-3-11 D&D-3-24	07/28/99
06/24/99	5001	P05090-05520	06/29/99	SCO (pipe w/insulation)	D&D-3-9 D&D-3-11 D&D-3-24	07/28/99
06/28/99	861	P05083-05523	06/28/99	Railroad Ties	D&D-3-3	07/20/99
06/28/99	861	P05084-05524	06/28/99	Railroad Ties	D&D-3-3	08/02/99
06/28/99	861	P05086-05525	06/29/99	Railroad Ties	D&D-3-3	07/20/99
06/30/99	861	P05085-05526	06/30/99	Railroad Ties & Stairs	D&D-3-3	07/28/99
06/30/99	861	P04588-05527	06/30/99	Railroad Ties & Stairs	D&D-3-3	07/28/99
07/06/99	374	H06492-05528	07/06/99	Concrete	D&D-3-69	08/02/99

BUILDING 788 CLUSTER DEMO WASTE TRACKING LOG

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RMRS / FWEC Waste Coordinator-Ernie Bentsen Updated 10/05/99

DATE CONTAINER INITIATED	IDC / WFC	CONTAINER NUMBER	DATE CONTAINER FILLED	*WASTE DESCRIPTION*	WASTE STREAM NUMBER	DATE CONTAINER SHIPPED
07/07/99	861	P05160-05529	07/15/99	Combustibles (wood, PPE)	D&D-3-3	08/02/99
07/08/99	374	H06488-05531	07/12/99	Concrete	D&D-3-69	08/02/99
07/08/99	374	H06489-05532	07/08/99	Concrete	D&D-3-69	08/02/99
07/08/99	374	H06493-05533	07/12/99	Concrete	D&D-3-69	08/02/99
07/12/99	480	X14362-05516	07/14/99	Recycle Metal (RM2-0160) 7,610 lb	D&D-3-11	07/29/99
07/13/99	374	H06486-05534	07/13/99	Concrete	D&D-3-69	08/02/99
07/13/99	374	H06487-05535	07/13/99	Concrete	D&D-3-69	08/02/99
07/14/99	374	H06490-05536	07/14/99	Concrete	D&D-3-69	08/02/99
07/14/99	374	H06491-05537	07/14/99	Concrete	D&D-3-69	08/02/99
07/14/99	5001	P05161-05530	07/22/99	SCO (wire & junk)	D&D-3-9 D&D-3-11	08/02/99
07/14/99	374	P05186-05538	07/15/99	Concrete	D&D-3-69	08/02/99
07/19/99	861	P05051-05539	07/19/99	Combustible (wood, PPE)	D&D-3-3	08/02/99
07/19/99	374	H06421-05540	07/22/99	Concrete	D&D-3-69	08/02/99
07/20/99	861	P05061-05541	07/20/99	Combustibles (wood)	D&D-3-3	08/02/99
07/20/99	861	P05059-05542	07/21/99	Combustibles (wood)	D&D-3-3	08/02/99
07/22/99	861	H06420-05543	07/22/99	Combustibles (wood & PPE)	D&D-3-3	08/02/99
09/22/99	532	X04861	09/22/99	Paint Chips	788-NR-01	09/22/99

ATTACHMENT 9

LETTERS OF COMPLETION
AND
PHOTOGRAPHS

OUTGOING LTR. NO:		
DE ORDER #		
99-RF-02380		
DIST.	LTR	ENC
NSUSSEN, STAN		
AILSFORD, M.		
RMOLINI, ANN		
RDGE, LARRY		
RD, BOB		
LTON, JOHN		
RDING, WYNN		
LL, JOHN		
ARTINEZ, LEN		
RKER, ALAN		
LSTON, STEVE		
ELTON, DAVE	X	
ORHEIS, GARY		
CHIBALD, JIM	X	
RR, KENT	X	
THRIE, VERN	X	
DAHL, TIM	X	
ILLIPS. F	X	
ORTH. K	X	
OHNS. T	X	
RRES.CONTROL	X	X
MIN RECRD/080		
AFFIC		
TS/T130G		
CLASSIFICATION:		
NI		
CLASSIFIED	X	X
NFIDENTIAL		
CRET		
ITHORIZED CLASSIFIER SIGNATURE:		
te: 6/18/99		
REPLY TO RFP CC NO.:		
ACTION ITEM STATUS:		
PARTIAL/OPEN		
CLOSED		
LTR APPROVALS:		
ORIG. & TYPIST INITIALS: KAD:kjs		
6469 (Rev. 8/4/95)		

Rocky Flats Environmental Technology Site

June 22, 1999 99-RF-0238(

Joe Schieffelin
Unit Leader
Permits and Compliance Unit
Federal Facilities Program
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive S., B-2
Denver, CO 80222-1530

SOLAR PONDS CLARIFIER TANK - AMP-139-99

Ref: Florence J. Phillips ltr to Joe Schieffelin, Same Subject, April 3, 1998

Dear Mr. Schieffelin:

This is to notify you that, in accordance with the agreement documented in the letter referenced abc regarding the 1997 Tank Management Plan, the United States Department of Energy (DOE) and Ka Hill Company, L.L.C. and it subcontractors have completed dismantling the solar ponds clarifier tani defined in that letter. The 207A clarifier (tank 138) and the plywood building surrounding the tank w dismantled and cut up, and the resultant waste was subsequently packaged and appropriately remc from the project site June 7, 1999. Please see the attachment which we are providing for your information.

If you have any questions, please contact Sandi MacLeod at 303-966-3367, or the Kaiser-Hill Projec Manager, Kent Dorr at 303-966-6034, so that any issues can be resolved in a timely manner.

Sincerely,

Joseph A. Legare
Assistant Manager for Environment & Infrastructure
Rocky Flats Field Office
U.S. Department of Energy

Alan M. Parker
Vice President
Closure Projects Integration
Kaiser-Hill Company, L.L.C.

KAD:kjs

Attachment:
As Stated

cc:
Rick DiSalvo Sandi MacLeod Matt McCormick John Rampe

89

ROCKY FLATS PLANT

PROJECT BENEFICIAL OCCUPANCY - SUBSTANTIAL COMPLETION NOTICE FOR THE REMOVAL OF THE CLARIFIER TANK 207A AND SURROUNDING PLYWOOD STRUCTURE

DATE: June 4, 1999

PROJECT: B788 RCRA Closure Project

BUILDING: Tank 207A and Plywood Structure

AUTHORIZATION# MA78EG00

SUBCONTRACT # RM907377

CONTRACTOR: Foster-Wheeler

BENEFICIAL OCCUPANCY IS TAKEN OF THE FOLLOWINGSITE AND/OR EQUIPMENT OF THE REFERENCED PROJECT WITH EXCEPTIONS AS NOTED:

None

NOTE:

ALL WASTE WAS PACKAGED AND DISPOSITIONED APPROPRIATELY

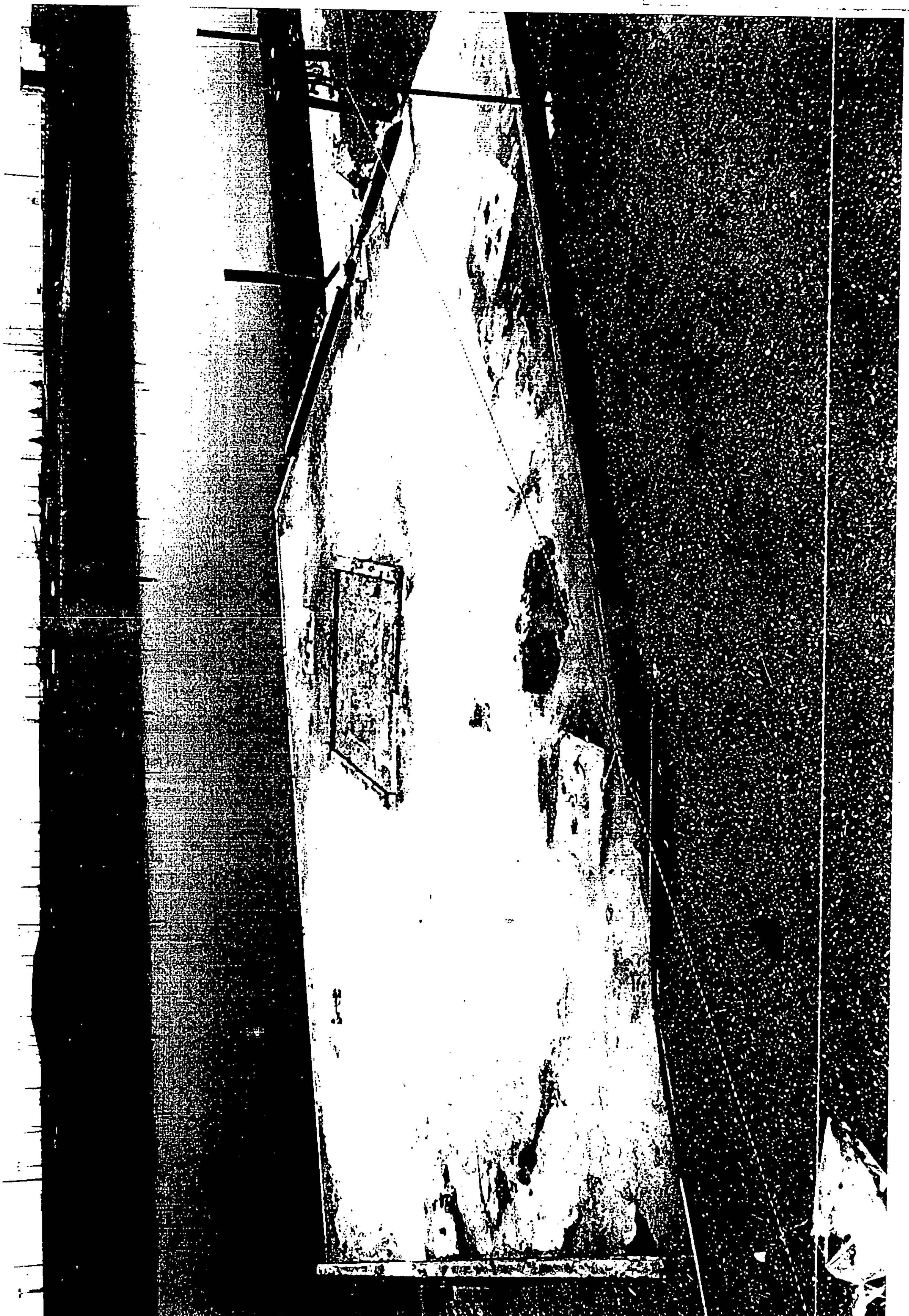
JUNE 7, 1999.

K.A.

REQUIRED APPROVALS	REQUIRED DISTRIBUTION
FACILITY MANAGER / LANDLORD	AREA UTILITIES MANAGER
K-H PROJECT MANAGER / RMRS PROJECT MANAGER	PLANT ALARMS
	TELECOMMUNICATIONS
	FIRE PROTECTION ENGINEERING
R P Campbell 6-15-99 PROJECT ENGINEER	HEALTH & SAFTEY AREA MANAGEMENT
	ENVIRONMENTAL MANAGEMENT
6-14-99 KH.CM	WASTE OPERATIONS
	CRITICALITY ENGINEERING
X RMRS CST.MGT. 6.15.99	EMERGENCY PREPAREDNESS
	SUBCONTRACTOR ADMINISTRATOR
	PROPERTY MANAGEMENT

THE ABOVE PROJECT IS BEING COMPLETED THROUGH INTEGRATED WORK CONTROL PACKAGE (IWCP) NUMBER(S) _____

RF/RMRS-99-426.UN
Page 9-2 of 9-36



OUTGOING LTR. NO.		
E ORDER #		
• 99-RF-02893		
DIST.	LTR	ENC
NSUSSEN, STAN		
AILSFORD, M.		
RMOLINI, ANN		
RDGE, LARRY		
RD, BOB		
LTON, JOHN		
RDING, WYNN		
L, JOHN		
ARTINEZ, LEN		
RKER, ALAN		
LSTON, STEVE		
ELTON, DAVE		
ORHEIS, GARY		
CHIBALD, JIM	X	X
THIS, BRIAN	X	X
THRIE, VERN	X	X
DRR. K	X	X
RRES.CONTROL	X	X
MIN RECRD/080		
AFFIC		
TS/T130G		
CLASSIFICATION:		
NI		
CLASSIFIED	X	X
NFIDENTIAL		
CRET		

THORIZED CLASSIFIER SIGNATURE: NO
A. Dorr
te: 7/21/99

REPLY TO RFP CC NO.:

ACTION ITEM STATUS:
PARTIAL/OPEN
CLOSED

LTR APPROVALS:

ORIG. & TYPIST INITIALS:
KAD:kjs

6469 (Rev. 8/4/95)

92

KAISER•HILL COMPANY

July 22, 1999

99-RF-02893

Sandra MacLeod
General Engineer
DOE, RFFO

TRANSMITTAL OF THE BENEFICIAL OCCUPANCY/SUBSTANTIALLY COMPLETE NOTICE FOR THE DEMOLITON OF BUILDING 308A, BUILDING 788 AND THE RELOCATION OF TRAILER T788A – KAD-018-99

Ref: Vern Guthrie ltr, CLG-012-99, to Kent Dorr, Same Subject, July 12, 1999

This letter and attachments are to notify you that the Building 788 Resource Conservation and Recovery Act (RCRA) Closure Project is complete.

The letter referenced above documents project completion on July 12, 1999. The project scop was to demolish Buildings 308A, 788, 788A, relocate trailer T788A and removal of all ancillary treatment equipment and debris in and around the solar pond area.

If you have any questions or concerns regarding this letter contact me at extension 6034.

Kent D. Dorr

Kent Dorr
Project Manager
D&D Project Execution

KAD:cah

Enclosure:
As Stated

Original & 1cc – Sandy MacLeod

cc:
Rick DiSalvo
Mathew McCormick

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.700
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

RMRS
Rocky Mountain
Remediation Services, L.L.C.
. . . protecting the environment
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, Colorado 80402-0464
Phone: (303) 966-7000

July 12, 1999

Kent Dorr
Bldg. 130
Kaiser-Hill Company, L.L.C.
P. O. Box 464
Golden, CO 80402-0464

TRANSMITTAL OF BENEFICIAL OCCUPANCY / SUBSTANTIALLY COMPLETE NOTICE FOR THE DEMOLITION OF B308A, B788 AND RELOCATION OF T788A – CLG-012-99

Attached is a copy of the Beneficial Occupancy / Substantially Complete Notice utilized to demonstrate completion of the demolition of B308A, B788, B788A, the relocation of T788A and the removal of all excess equipment and debris in and around the solar pond area. Also attached are several pictures of the site showing the work has been accomplished.

This project entailed demolishing B308A and all ancillary treatment equipment, removal of all excess equipment and debris in and around the solar pond area, and piping and power supply modifications to the Modular Storage Tank transfer system. Also included was the demolition of B788, B788A and relocating T788A.

If you have any questions or concerns regarding the above feel free to contact me at X7419.

Vern Guthrie, Project Manager
Building 788 RCRA Closure Project

rcg

Attachments:
As Stated (2)

93

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

PROJECT BENEFICIAL OCCUPANCY - SUBSTANTIAL COMPLETION NOTICE FOR THE DEMOLITION OF B308A, B788, RELOCATION OF T788A, AND REMOVAL OF EXCESS EQUIPMENT AND DEBRIS IN AND AROUND THE SOLAR POND AREA

DATE: July 12, 1999
PROJECT: B788 RCRA Closure Project
BUILDING: B308A, B788, B788A, and T788A
AUTHORIZATION# MA78EG00
SUBCONTRACT # RM907377/RM807290RR2
CONTRACTOR: Foster-Wheeler / DWRC

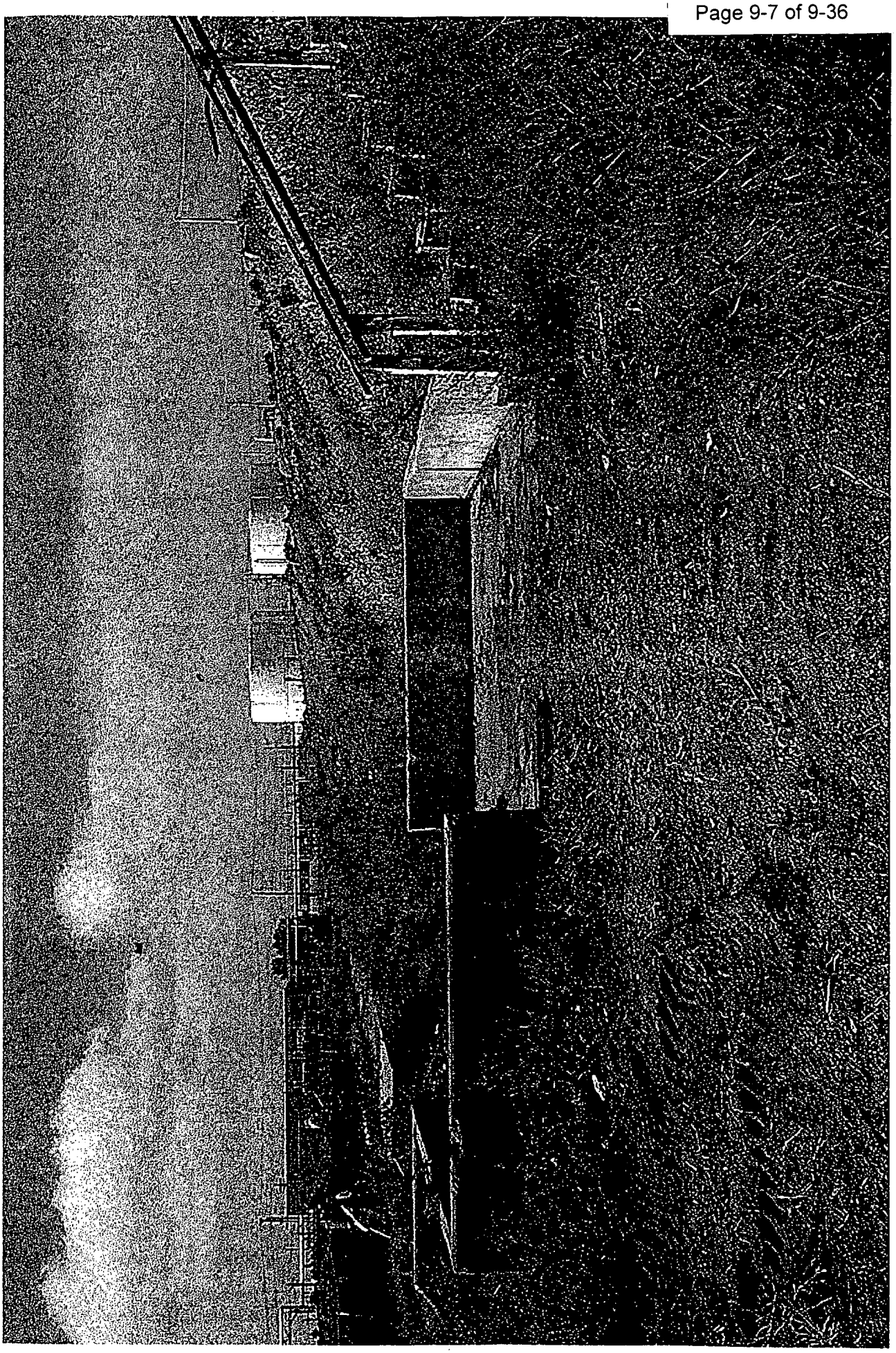
BENEFICIAL OCCUPANCY IS TAKEN OF THE FOLLOWING SITE AND/OR EQUIPMENT OF THE REFERENCED PROJECT WITH EXCEPTIONS AS NOTED:

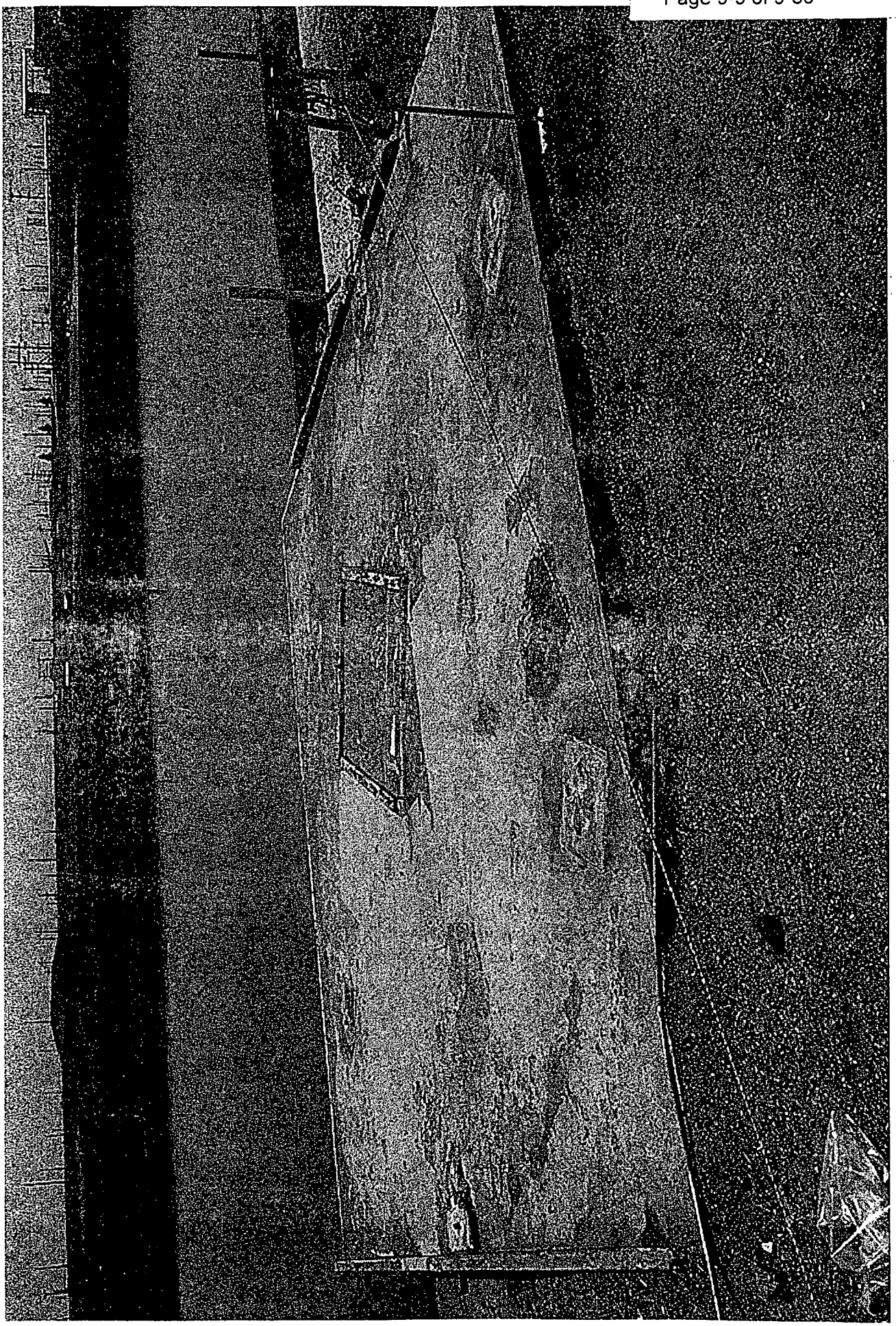
See attached Punch List along with scheduled completion dates for each item.

REQUIRED APPROVALS	REQUIRED DISTRIBUTION
FACILITY MANAGER / LANDLORD	AREA UTILITIES MANAGER
RMRS PROJECT MANAGER	PLANT ALARMS
K-H PROJECT MANAGER 7/12/99	TELECOMMUNICATIONS
RMRS PROJECT ENGINEER Robert P. Campbell 7/12/99	FIRE PROTECTION ENGINEERING
K-H CONSTRUCTION MANAGEMENT 7/12/99	HEALTH & SAFTEY AREA MANAGEMENT
RMRS CONSTRUCTION MANAGEMENT 7/13/99	ENVIRONMENTAL MANAGEMENT
	WASTE OPERATIONS
	CRITICALITY ENGINEERING
	EMERGENCY PREPAREDNESS
	SUBCONTRACTOR ADMINISTRATOR
	PROPERTY MANAGEMENT
	PLANT SERVICES

THE ABOVE PROJECT IS BEING COMPLETED THROUGH INTEGRATED WORK CONTROL PACKAGE (IWCP) NUMBER(S)

94





Dorr, Kent

From: Dorr, Kent
Sent: Monday, August 09, 1999 11:58 AM
To: MacLeod, Sandra
Cc: McCranie, Deanna; Guthrie, Vern; Dessi, Matt; Hoover, John
Subject: B788 DOE walkdown.

Sandi,

This email is to document the walkdown that was conducted today at 9:15 at the project site w/ DOE, KH and RMRS. The walkdown was to document the removal of the facilities and the corresponding waste package identification. There were no waste crates present but the Waste Summary Report for the project does document the items removed from the site. A copy of this report was delivered to your office.

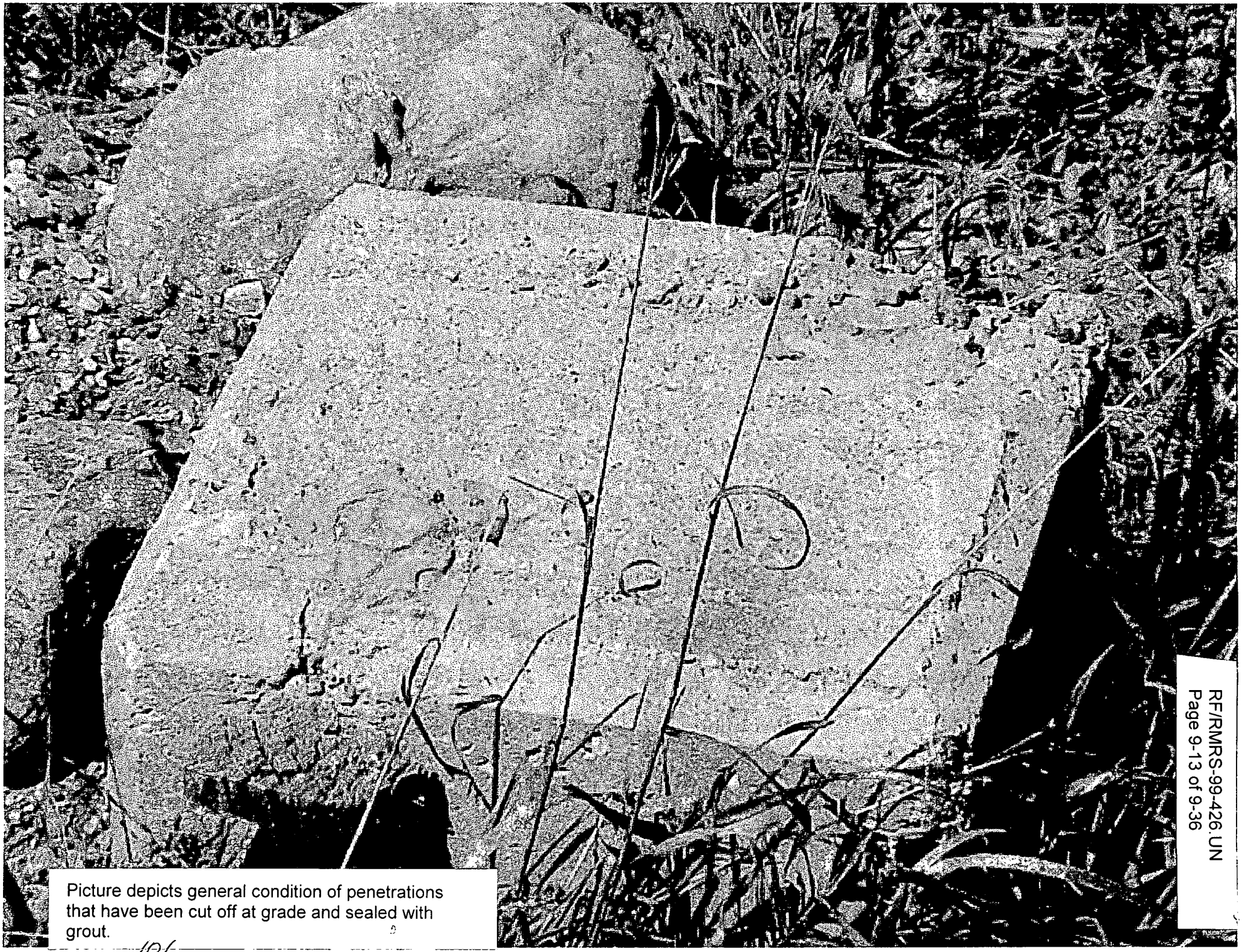
The items identified today that will be addressed at our 8:30 am. mtg. this Wednesday the 11th are:

1) The final posting for the site before the site is turned over to ER.
2) The final radiological controls and posting for the clarifier concrete pad.

If your understanding of the these items is different, please let me know.
Kent

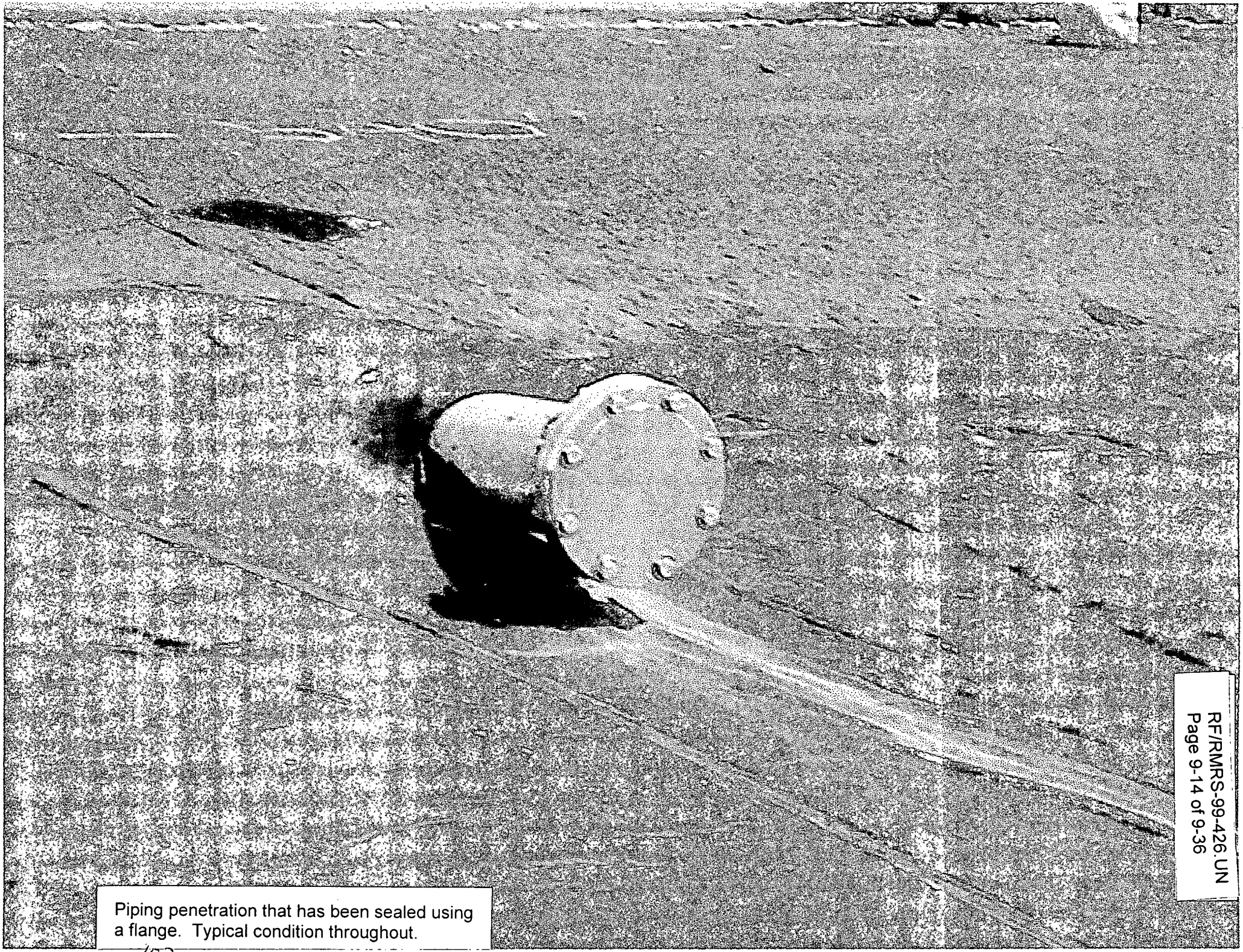
Completed project. Looking northeast. Building 788A covered with soil.

99



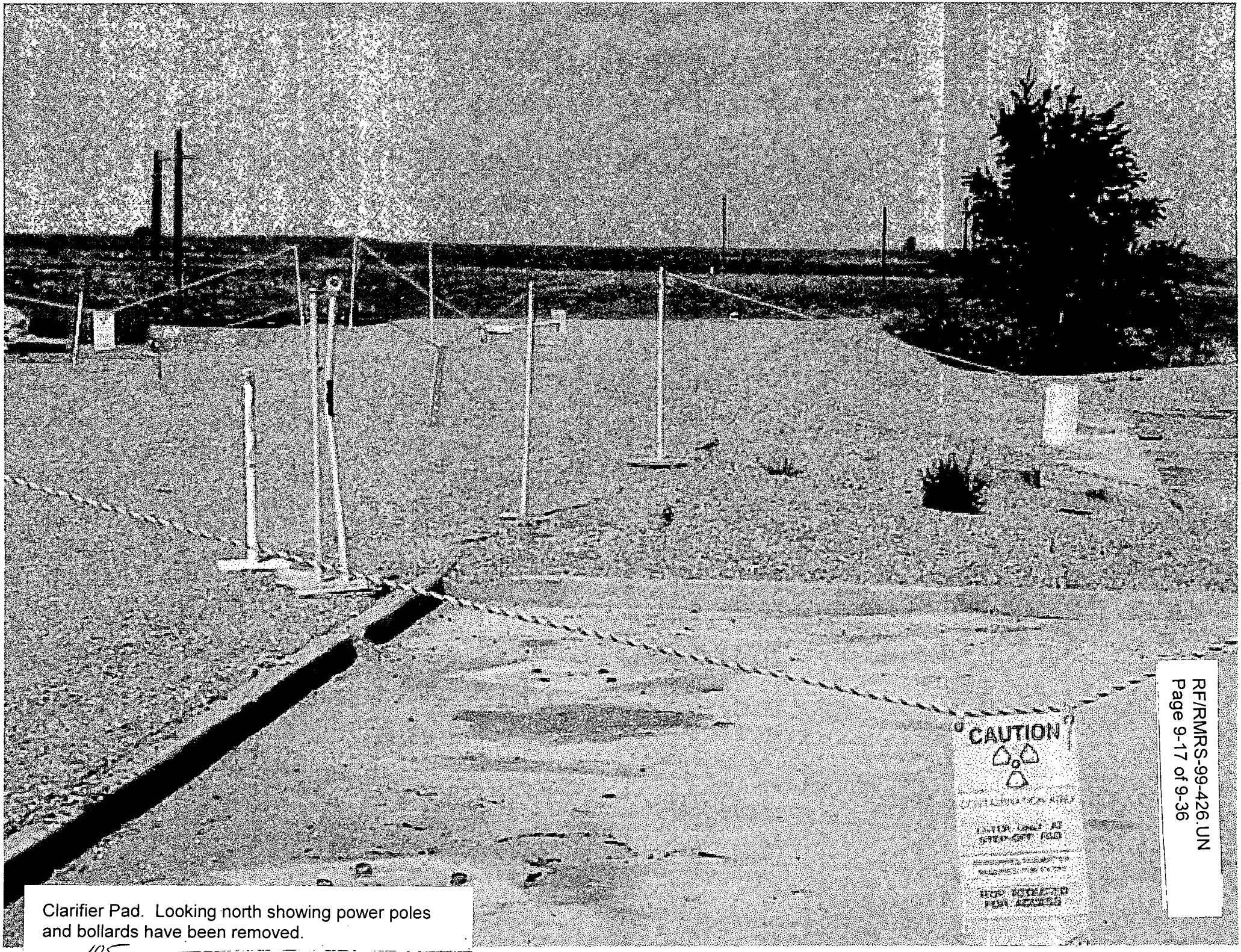
Picture depicts general condition of penetrations that have been cut off at grade and sealed with grout.

10f



Piping penetration that has been sealed using a flange. Typical condition throughout.

102

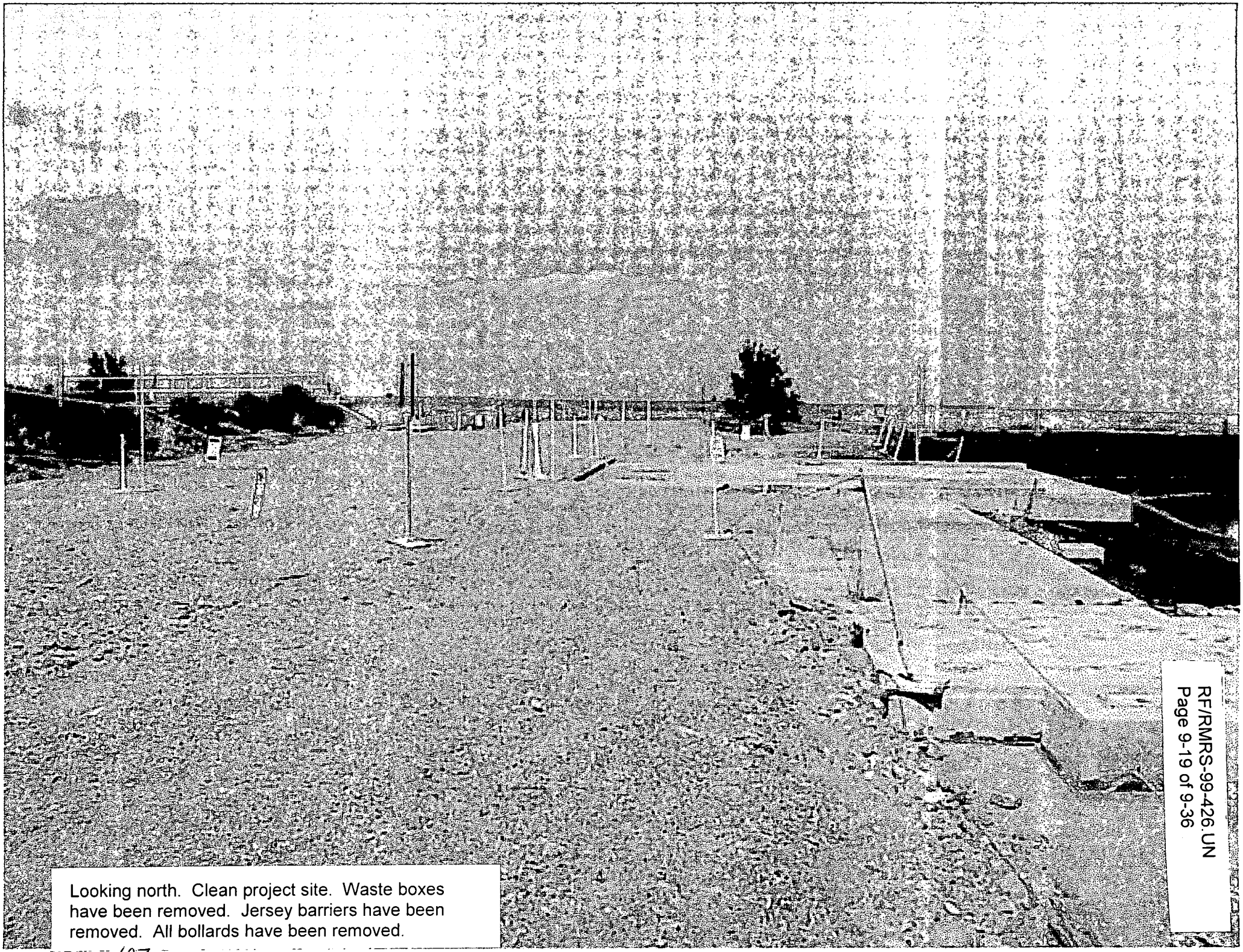


Clarifier Pad. Looking north showing power poles and bollards have been removed.

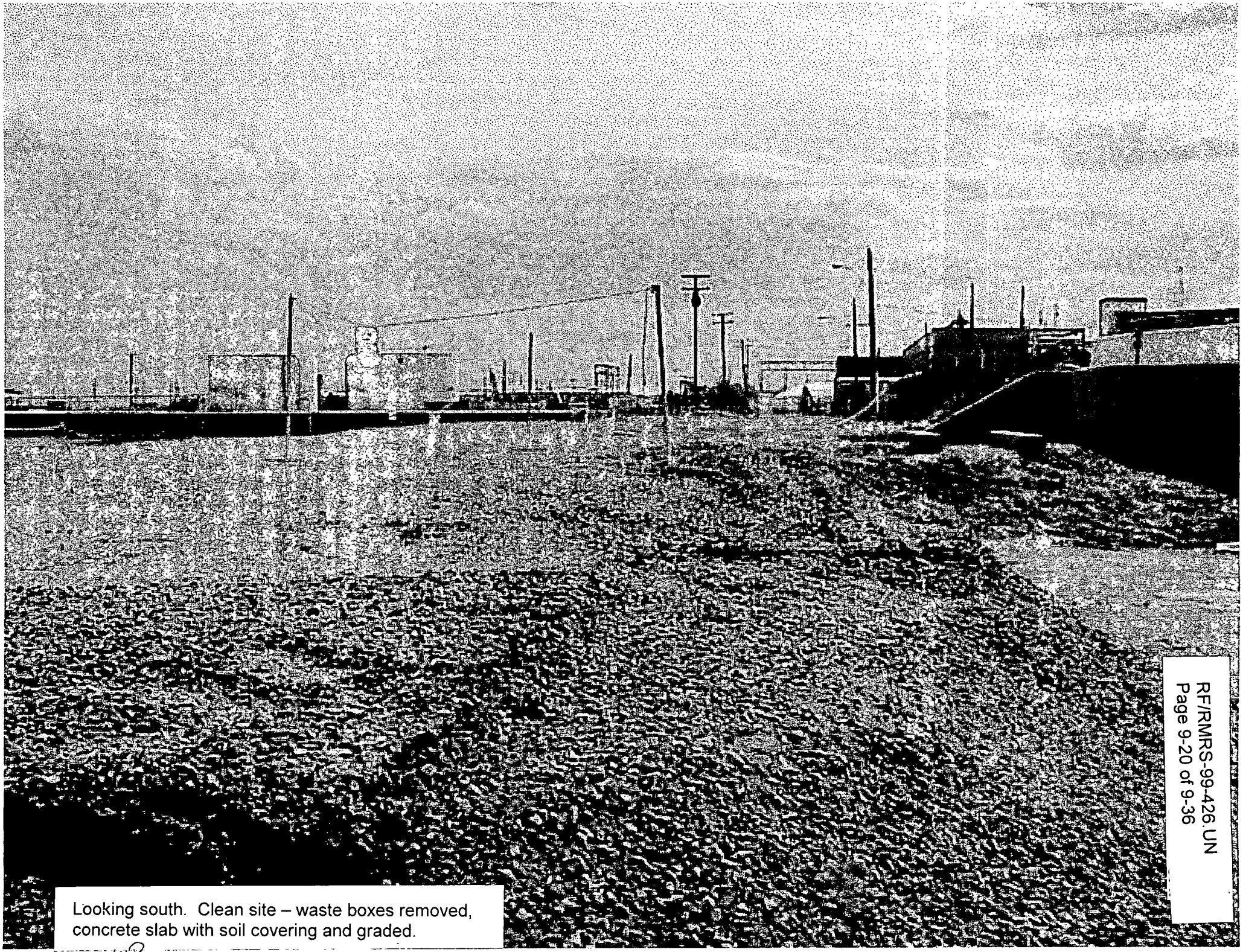
105

Looking north showing bollards and support structures have been removed.

106

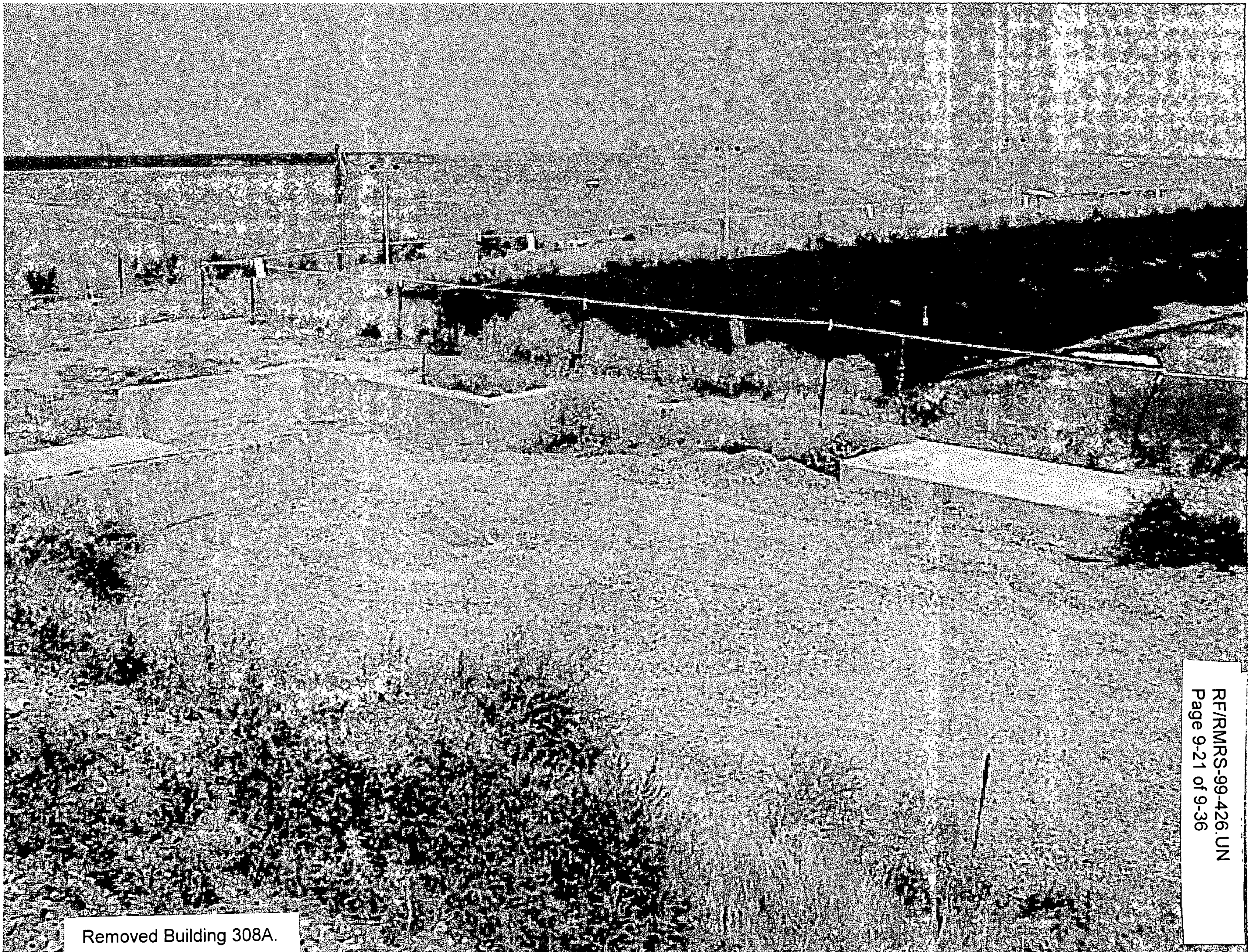


Looking north. Clean project site. Waste boxes have been removed. Jersey barriers have been removed. All bollards have been removed.

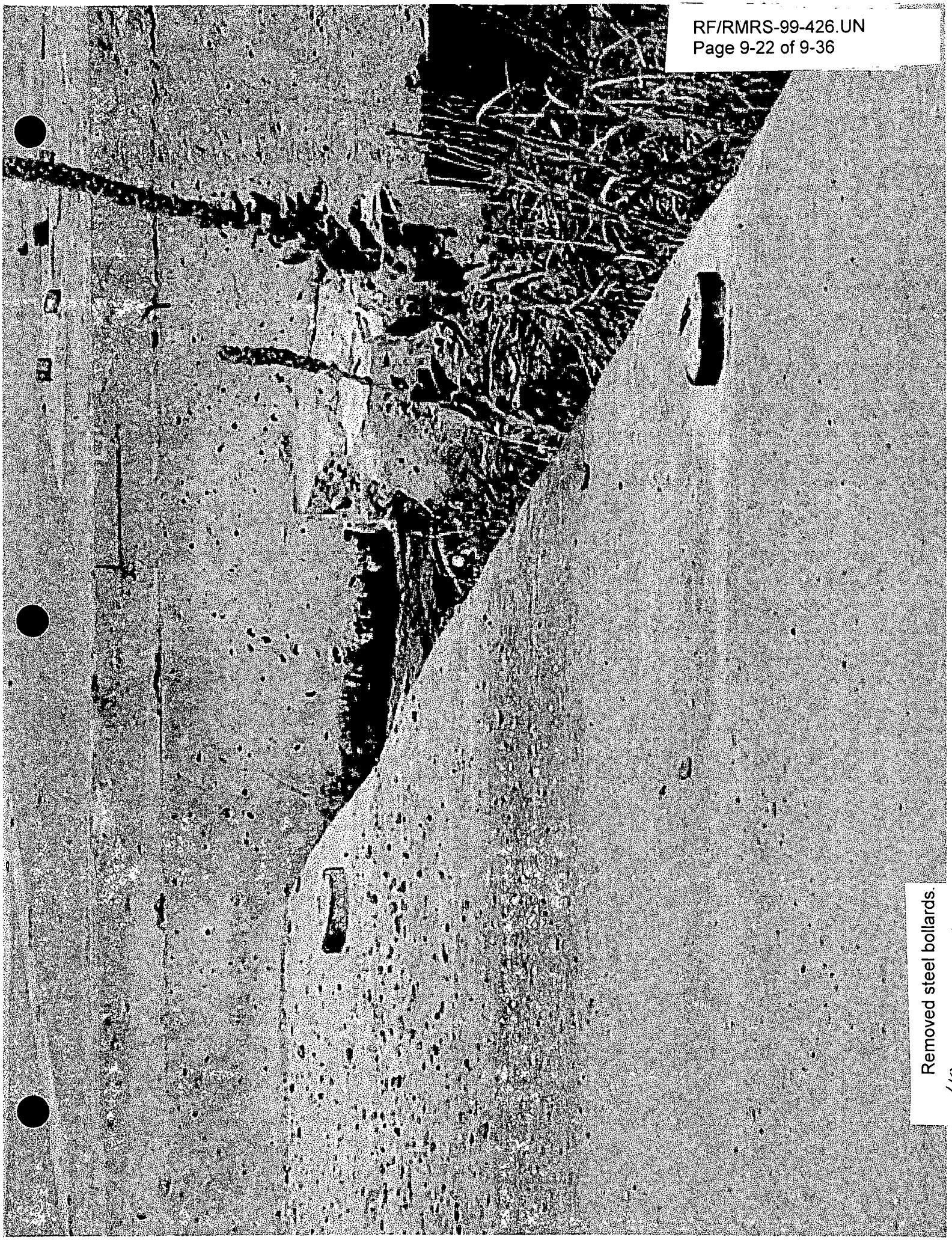


Looking south. Clean site – waste boxes removed, concrete slab with soil covering and graded.

108



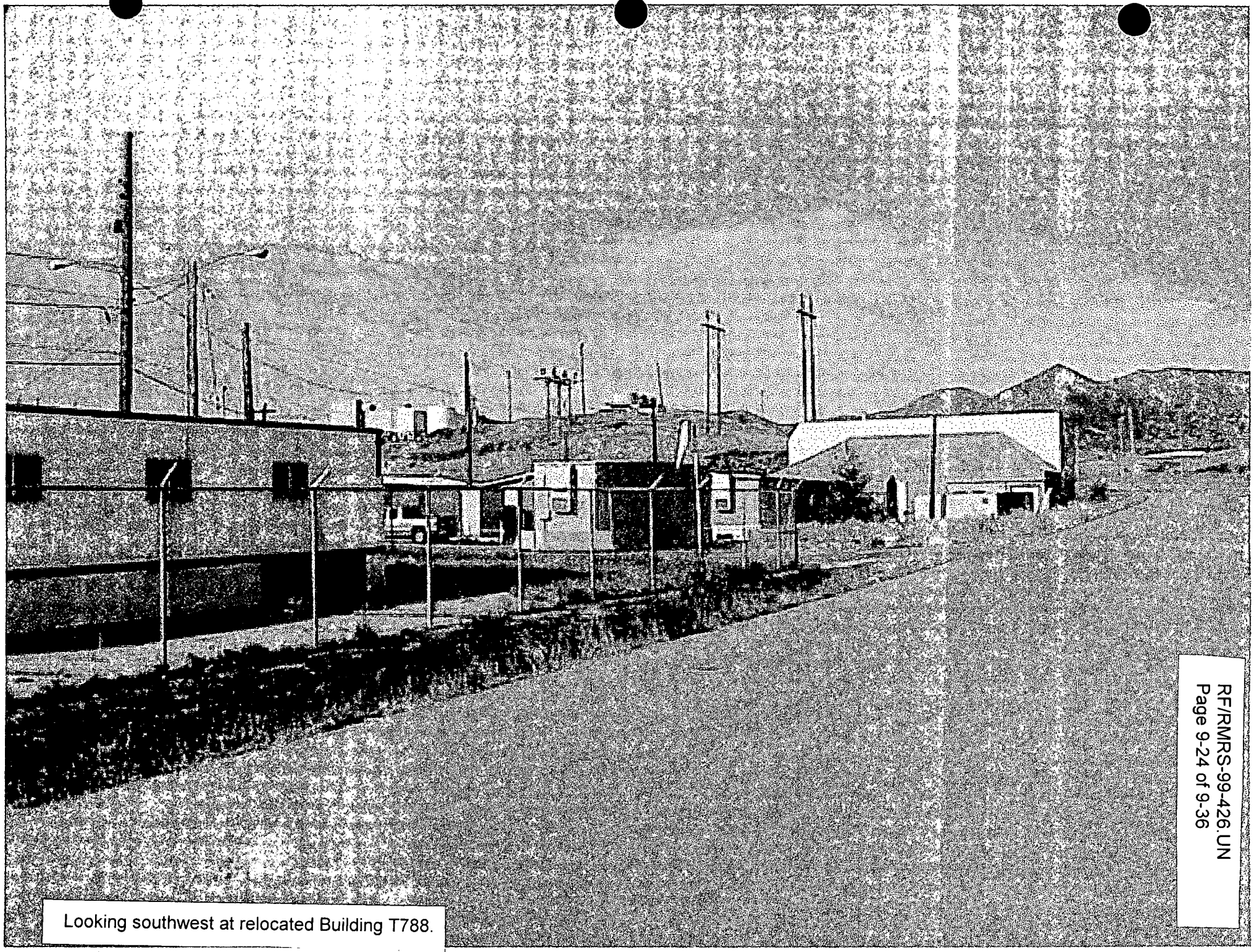
Removed Building 308A.



Removed steel bollards.

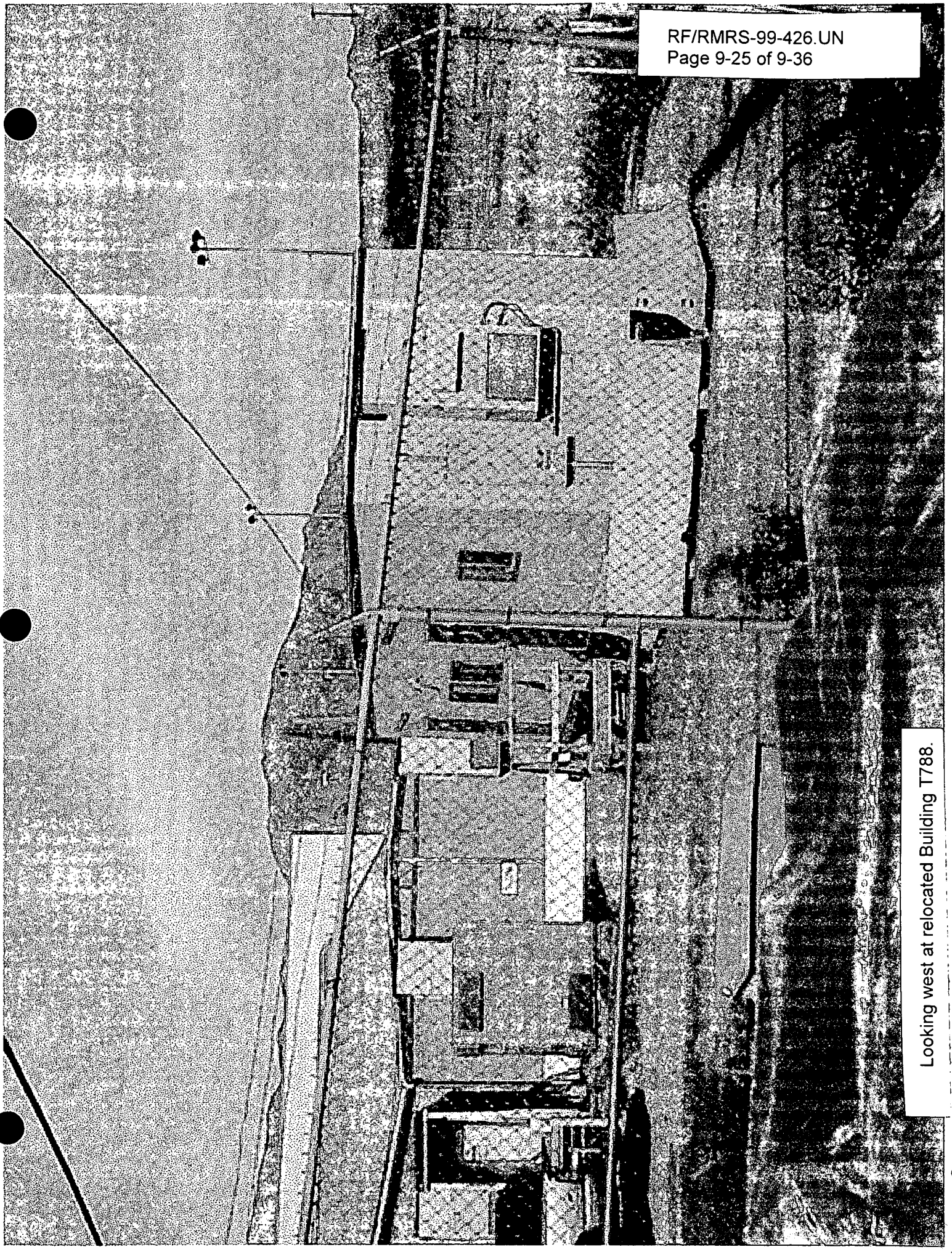
10

Removed power poles.



Looking southwest at relocated Building T788.

112



Looking west at relocated Building T788.

RFP-1325.01 (Rev. 6/97)
CORRES. CONTROL
OUTGOING LTR NO.
DOE ORDER #
99RF03457

DIST.	Ltr	Enc
Bensussen, S. J.		
Brailsford, M. D.		
Card, R. G.		
Cosgrove, M. M.		
Cox, C.M.		
Crawford, A. C.		
DeJong, V. J.		
Dieterle, S. E.	✓	
Ferrera, D. W.		
Fulton, J. C.		
Germain, A. L.		
Ito, F.M.		
Martinez, L.A.		
Parker, A.		
Polston, S		
Tuor, N. R.		
Cable, J.R.		
Demorest, J.L.		
Hayduk, R.B.		
Hoague, G.		
Kopplin R.E.		
Lucerna, J.J.		
Marschall, J.R.		
Parker, T.J.		
Perry, R.D.		
Thompson, J.D.	✓	
NORM SPRUS	✓	
PAT ERWIN	✓	
CORRES CONTROL	X	X
PATS/T130G		
CLASSIFICATION:		
UCNI		
UNCLASSIFIED	X	
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE
9/8/99
DATE

IN REPLY TO RFP CC NO:

ACTION ITEM STATUS
__PARTIAL/OPEN
__CLOSED
ORIG. & TYPIST INITIALS

KAISER•HILL COMPANY

August 31, 1999 99-RF-03457

Steven R. Schiesswohl
Realty Officer
DOE, RFFO

RECLASSIFICATION OF TRAILERS, SHEDS, & TANKS - SED-109-99

Kaiser-Hill requests your approval to remove the listed trailers from the Real Property Records and make ready for their disposition as personal property. Kaiser-Hill has determined that these Facilities are now or soon will be excess to the Site mission and are requesting that they be reclassified as personal property.

Currently excess to the Site:
- Trailer T788A

Previously submitted for reclassification, but not approved
- ~~Trailer T452C~~
- Trailer T452D
- Trailer T452E
- Trailer T452F
- Trailer T452G
- Trailer T771D

Your concurrence is appreciated as soon as possible.

Steve E. Dieterle
Division Manager
Safeguards, Security,
Site Operations & Integration
Kaiser-Hill Company, L.L.C

NDS:vlb

Orig. and 1 cc – S. Schiesswohl, DOE:RFFO

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

RESOURCE
TECHNOLOGIES
GROUP, INC.

3900 S. Wadsworth Blvd., Suite 155
Lakewood, Colorado 80235-2205
303-969-8511
FAX 303-989-8188

September 23, 1999

Mr. Robert E. Fiehweg
Rocky Mountain Remediation Services, L.L.C.
Rocky Flats Environmental Technology Site
10808 Highway 93, Unit B
Golden, Colorado 80403-8200

Re: Transmittal
Closure Certification Report for Concrete Pads at RCRA Units 21 and 48
Rocky Flats Environmental Technology Site

Dear Mr. Fiehweg:

Resource Technologies Group, Inc. (RTG) is please to present the Closure Certification Report for Concrete Pads at RCRA Units 21 and 48, in support of the Building 788 Closure Project. The Closure Certification Report is being submitted in one loose-leaf copy, complete with Professional Engineer certification, to facilitate incorporation into the Closure Summary Report for Building 788. Please let me know if additional certified copies are needed.

RTG appreciates the opportunity to assist RMRS with this important project. Feel free to call me on extension 6694 with any questions or comments on the Closure Certification Report.

Sincerely,

RESOURCE TECHNOLOGIES GROUP, INC.

Paul E. Pigeon, PE
Senior Engineer

cc:
C. L Guthrie, RMRS
R. C. Gransee, RMRS
K. M. Kelly, RTG

Enclosure
PEP/

115

CLOSURE CERTIFICATION REPORT
CONCRETE PADS AT RCRA UNITS 21 AND 48

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

Revision 0
September 23, 1999

Prepared for: Rocky Mountain Remediation Services, L.L.C.
Rocky Flats Environmental Technology Site
10808 Highway 93, Unit B
Golden, Colorado 80403-8200

Prepared by: Resource Technologies Group, Inc.
3900 South Wadsworth Blvd., Suite 155
Lakewood, Colorado 80235-2205

CLOSURE CERTIFICATION REPORT
CONCRETE PADS AT RCRA UNITS 21 AND 48
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

1.0 INTRODUCTION

As part of the closure project for Rocky Flats Environmental Technology Site (RFETS) Building 788 (B788), RCRA closure activities were conducted for RCRA Units 21 and 48, which are located within and surrounding B788. Unit 21 is a permitted storage unit located in B788, while Unit 48 is an interim status unit consisting of pondcrete solidification process equipment, including the clarifier and the pump transfer station at B308A. A decontamination strategy and Sampling and Analysis Plan (SAP) (RF/RMRS-99-319) were developed to clean close the RCRA unit concrete pads at B788, the clarifier and B308A. The decontamination and sampling field activities were conducted by Rocky Mountain Remediation Services, LLC (RMRS) from March through July 1999 and were observed by an independent professional engineer (hereinafter, the PE).

This report summarizes the field activities, identifying deviations from the SAP, presents sample analysis results and their statistical analysis, and provides a closure certification statement for RCRA Units 21 and 48.

2.0 SAMPLING AND ANALYSIS ACTIVITIES

Decontamination and sampling of the B788 and B308A concrete pads were accomplished in stages, with the activities performed in subsequent stages based upon analytical results for samples from the previous stage. Concurrently, the RCRA water sample parameters analyzed for samples from subsequent stages were pared down based on results from previous samples at the same locations.

Initially, the B788 South pad and the B308A pump station pad were decontaminated and sampled in accordance with the SAP, Sections 4.1 through 4.3. The South pad samples included the random sample grids Nos. 25, and 41 and the biased sampling location at a former contaminated area (CA). The former CA was small enough to include its entire floor area in the sampling. The RCRA water sample analysis results (discussed in Section 3.1) indicated resampling for B788 grid 25 and B308A. The South pad of B788 was subjected to a second round of decontamination and grid 25 was resampled in accordance with the SAP. B308A was not addressed again until after the pump station piping and building were removed.

Concurrently with the resampling of grid 25, the B788 North pad was decontaminated and sampled in accordance with the SAP. The North pad samples included the random sample grid Nos. 2, 8 and 12 and the biased sampling location in the Permacon. This stage was not initiated until overhead sludge and

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decant piping were removed above the North pad and a spray-on acrylic latex fixative was applied to the walls of the Permacon. The Permacon sample was collected from the center of the room because floor staining and pitting were evenly distributed across the floor area. Based on the RCRA sample analysis results, the Permacon was subjected to a second round of decontamination and sampling in accordance with the SAP.

At this point, additional decontamination and sampling were still indicated by the RCRA water metals results for the Permacon and B308A. Based upon the high metals concentrations in the B308A RCRA water sample and the fact that two rounds of decontamination of the Permacon in accordance with the SAP were unsuccessful, the next round incorporated a different decontamination method. High-pressure cold water spray decontamination was used and then the Permacon and B308A were resampled in accordance with the SAP. As presented in Section 3.1, these final samples also exceeded clean closure action levels.

Based upon the results for the Permacon and B308A pump station, and the observed condition of the clarifier pad, the clarifier pad was not decontaminated in accordance with the SAP. Loose material including frayed, peeling sections of an existing concrete sealant layer were scraped off and removed and a spray-on acrylic latex fixative was applied.

3.0 RCRA WATER SAMPLE RESULTS AND STATISTICAL ANALYSIS

3.1 Constituents of Concern in RCRA Samples

Analytical results for RCRA constituents of concern at Units 21 and 48 are listed on Table 3-1, including cyanide, nine metals and one volatile organic compound. Only 2-butanone was detected and so it is the only organic listed. Sample numbers listed include the assigned RIN code followed by the event sample number. Sampling dates and "resample" labels are included to indicate the stages of decontamination and resampling. Tier II ground water action levels from the Rocky Flats Cleanup Agreement (RFCA) are the clean closure action levels and achievement or exceedance of the action levels are marked "Pass" or "Fail", respectively.

The results show that, with the exception of the B308A samples, exceedances of the action levels occurred only for cadmium. In the final B308A sample, collected on July 12, 1999, exceedances occurred for cadmium, chromium and lead.

Clean closure was achieved for the former CA on the South pad of B788, while clean closure failed for the Permacon and the B308A pump station. The results for the random sampled area of the B788 pad are addressed in Section 3.2, while the Permacon, B308A and clarifier pads are covered in Section 4.0.

3.2 Statistical Analysis of Random Sample Results

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The analytical results in Table 3-1 from grids 2, 8, 12, 25 (resample) and 41 were statistically evaluated together in accordance with SAP Section 4.3 to assess whether clean closure was achieved for the B788 pad exclusive of the biased sample locations. This evaluation included the results from grid 12, which individually exceeded the action level for cadmium by 0.0014 mg/l. The mean cadmium concentration calculated from these five samples was 0.0027 mg/l, which is below the closure action level of 0.005 mg/l. However, the EPA G-4 sampling model (EPA, 1994) indicates that, to achieve 90% confidence that the mean is less than the clean closure action level for the RCRA water samples, a minimum of six samples would be required for the evaluation of cadmium.

Six samples were acquired to achieve the minimum as defined by the EPA G-4 model. In addition to the five random samples, the biased sample from the former CA was used in an attempt to conservatively represent contamination levels on the B788 concrete pad. Because the sixth sample was biased conservatively, it is included in the data set representative of the entire 788 concrete pad surface, excluding the walled Permacon. Other inputs into the EPA G-4 model were also conservative, including use of Student's t-statistics in lieu of z-scores and use of the arithmetic mean as the lower bound of the gray region. The beta error was set at 10% (to achieve 90% confidence); this to control the error (to 10%) of concluding the pad is RCRA-clean when it really is not. Alpha error was set at 20%, as a greater error was tolerated for concluding the pad is contaminated when, in fact, it is RCRA-clean.

The other RCRA constituents of concern were also evaluated for the necessary number of samples to assess 90% confidence, with none requiring more than two samples. A summary of the inputs and outputs from the statistical evaluation of 90% confidence is on Table 3-2.

Having established the adequacy of the number of samples taken, as described above, the 90% Upper Confidence Limit (UCL) was computed for each constituent of concern. The UCLs were computed consistent with EPA Guidance (EPA, 1993) and are displayed on Table 3-2. Because the metals of interest exhibit both normal and log-normal frequencies in background water matrices (DOE, 1993), the 90% UCL was computed assuming both normality and log-normality (i.e., the UCL was also evaluated via log-normal transformations when assuming log-normality). A t-statistic was selected for 90% confidence under the normal distribution assumption and 5 degrees of freedom. An H statistic was selected for the log-normal distribution and was specifically selected for each parameter based on the variance of the data set. None of the 90% UCLs exceeded the clean closure action level. The 90% UCL closest to an applicable clean closure action level was cadmium with a UCL range of 0.004 to 0.005 mg/l for normal and log-normal distribution assumptions, respectively, compared to the action level of 0.005 mg/l.

The statistical analysis showed that adequate sample quantities were collected and upper limits on the mean concentration values for all detected constituents of concern did not exceed the clean closure action levels. The decision criteria in SAP Section 4.3 for RCRA clean closure were met for the B788 concrete pad excluding the Permacon.

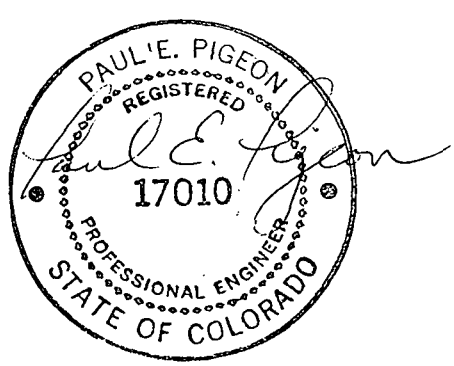
4.0 CLOSURE CERTIFICATION

The decontamination and sampling activities described in Section 2.0 were observed by the PE and were conducted in accordance with the SAP. Changes in decontamination technique and analyte lists during the latter stages of the closure activities were reviewed by the PE and found to be reasonable and appropriate to the objective of achieving RCRA clean closure of the concrete pads. In preparing this closure certification, the PE reviewed the analytical data generated and statistical analyses performed by RMRS. As attested by the PE seal and signature below, RCRA clean closure was achieved in accordance with the decision criteria in the SAP for the B788 concrete pad excluding the Permacon.

As attested by the PE seal and signature below, a RCRA stable condition was achieved for the concrete pads that make up the rest of the two RCRA units, by taking measures to prevent the release of waste constituents to the environment. The B788 Permacon area and B308A pump station pads were rendered RCRA stable by the chemical cleaning and high pressure spray methods employed for decontamination prior to collection of RCRA water samples. The clarifier pad was rendered RCRA stable by application of an acrylic latex spray-on fixative.

The concrete pads for RCRA Units 21 and 48, which are the remaining structural features for these units, will be deferred to Environmental Restoration (ER) for remediation.

PE seal and signature attesting to closure certification statements:



Paul E. Pigeon, PE
Colorado PE No. 17010

120

5.0 REFERENCES

EPA, 1993, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Publication 9285.708I

EPA, 1994, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Final, September.

DOE, 1993, *Background Geochemical Characterization Report*, Rocky Flats Environmental Technology Site (RFETS), Golden, Colorado.

Gilbert, R.O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

RF/RMRS-99-319, *Sampling and Analysis Plan for Concrete Pads at RCRA Units 21 and 48*, Revision 0, March 3, 1999.

121

5.0 REFERENCES

EPA, 1993, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, Publication 9285.708I

EPA, 1994, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Final, September.

DOE, 1993, *Background Geochemical Characterization Report*, Rocky Flats Environmental Technology Site (RFETS), Golden, Colorado.

Gilbert, R.O., 1987, *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

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Table 3-1

RCRA CLOSURE WATER SAMPLE RESULTS
RCRA UNITS 21 AND 48

Sample Number (RIN-Event)		99A5904-001	99A5904-002	99A5904-003	99A5904-004	99A6873-001 (Resample)	99A6873-002	99A6873-003	99A6873-004	99A6873-006	99A7628-001 (Resample)	99A8357-001 (Resample)	99A8357-005 (Resample)
Collection Date		3/22/99	3/24/99	3/24/99	3/24/99	4/27/99	4/27/99	4/27/99	4/27/99	4/27/99	5/27/99	7/12/99	7/12/99
Constituents of Concern	Action Level[1]	Pump Station B308A	B788 Grid # 41	B788 Former CA	B788 Grid #25	B788 Grid #25	B788 Grid #2	B788 Grid #8	B788 Grid #12	B788 Permacon	B788 Permacon	B788 Permacon	Pump Station B308A
Cyanide (CN)	0.2	0.046 PASS	U 0.005 PASS	U 0.005 PASS	U 0.005 PASS	Not Sampled	U 0.005 PASS	0.007 PASS	U 0.005 PASS	U 0.005 PASS	Not Sampled	Not Sampled	Not Sampled
Arsenic (As)	0.05	1.26 FAIL	0.0029 PASS	0.0031 PASS	0.0046 PASS	0.0013 PASS	0.0048 PASS	0.0045 PASS	0.002 PASS	0.0106 PASS	0.0133 PASS	0.0067 PASS	0.0301 PASS
Barium (Ba)	2	2.28 FAIL	0.0138 PASS	0.014 PASS	0.0392 PASS	0.0125 PASS	0.0043 PASS	0.0073 PASS	0.0073 PASS	0.02 PASS	0.0544 PASS	0.066 PASS	0.158 PASS
Cadmium (Cd)	0.005	2.13 FAIL	0.0021 PASS	0.0037 PASS	0.0195 FAIL	0.0019 PASS	0.0011 PASS	0.0022 PASS	0.0064 FAIL	0.0303 FAIL	0.0686 FAIL	0.0213 FAIL	0.213 FAIL
Chromium (Cr)	0.1	2.4 FAIL	0.0056 PASS	0.0082 PASS	0.0212 PASS	0.0047 PASS	0.0044 PASS	0.0082 PASS	0.0095 PASS	0.027 PASS	0.0548 PASS	0.0291 PASS	0.155 FAIL
Lead (Pb)	0.015	11.7 FAIL	0.006 PASS	0.0073 PASS	0.0273 FAIL	0.003 PASS	0.002 PASS	0.0046 PASS	0.0046 PASS	0.0145 PASS	0.029 FAIL	0.0125 PASS	0.522 FAIL
Mercury (Hg)	0.002	0.0137 FAIL	U 0.0001 PASS	0.0001 PASS	0.00017 PASS	U 0.0001 PASS	U 0.0001 PASS	U 0.0001 PASS	U 0.0001 PASS	0.00013 PASS	0.00018 PASS	U 0.0001 PASS	U 0.0001 PASS
Nickel (Ni)	0.14	0.653 FAIL	0.0066 PASS	0.009 PASS	0.0157 PASS	0.002 PASS	0.0088 PASS	0.0096 PASS	0.0046 PASS	0.0161 PASS	0.0338 PASS	0.0144 PASS	0.0936 PASS
Selenium (Se)	0.05	0.0141 PASS	U 0.0009 PASS	0.0012 PASS	U 0.0009 PASS	U 0.0012 PASS	U 0.0012 PASS	U 0.0012 PASS	U 0.0012 PASS	U 0.0012 PASS	0.0016 PASS	U 0.00002 PASS	U 0.00092 PASS
Silver (Ag)	0.183	0.09 PASS	0.00046 PASS	0.0005 PASS	0.0012 PASS	U 0.00035 PASS	U 0.00035 PASS	U 0.00035 PASS	U 0.00035 PASS	0.00071 PASS	0.0018 PASS	0.00067 PASS	0.0014 PASS
2-Butanone	21.9	J 0.009 PASS	J 0.002 PASS	J 0.002 PASS	J 0.002 PASS	Not Sampled	U 0.01 PASS	U 0.01 PASS	U 0.01 PASS	U 0.001 PASS	Not Sampled	Not Sampled	Not Sampled

[1] RFCA Table 2 Ground Water Action Levels Tier 2.

NOTES:
1. All concentrations in mg/L.
2. Qualifiers: J = Estimated value below instrument detection limit.
   U = Not detected.

Table 3-2

STATISTICAL ANALYSIS OF RCRA WATER SAMPLES
BUILDING 788 CONCRETE PAD

RCRA Water Samples	Cyanide (CN)		Arsenic (As)		Barium (Ba)		Cadmium (Cd)		Chromium (Cr)		Lead (Pb)		Mercury (Hg)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		2-butanone	
	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log	(ppb)	nat log
Grid 41	5	1.609	2.9	1.065	13.8	2.625	2.1	0.742	5.6	1.723	6	1.792	0.1	-2.303	6.6	1.887	0.9	-0.105	0.46	-0.777	2	0.693
Grid 25 (resample)	5	1.609	1.3	0.262	12.5	2.526	1.9	0.642	4.7	1.548	3	1.099	0.1	-2.303	2	0.693	1.2	0.182	0.35	-1.050	2	0.693
Grid 2	5	1.609	4.8	1.569	4.3	1.459	1.1	0.095	4.4	1.482	2	0.693	0.1	-2.303	8.8	2.175	1.2	0.182	0.35	-1.050	10	2.303
Grid 8	7	1.946	4.5	1.504	7.3	1.988	2.2	0.788	8.2	2.104	4.6	1.526	0.1	-2.303	9.6	2.262	1.2	0.182	0.35	-1.050	10	2.303
Grid 12	5	1.609	2	0.693	7.3	1.988	6.4	1.856	9.5	2.251	4.6	1.526	0.1	-2.303	4.6	1.526	1.2	0.182	0.35	-1.050	10	2.303
Former CA	5	1.609	3.1	1.131	14	2.639	3.7	1.308	8.2	2.104	7.3	1.988	0.1	-2.303	9	2.197	1.2	0.182	0.5	-0.693	2	0.693
Statistical Parameters for 90% Confidence																						
Assumed Distribution	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans	normal	log trans
Standard Deviation (Std Dev)[2]	0.7	0.14	1.9	0.50	16.7	0.47	3.7	0.61	4.6	0.33	3.7	0.47	0.00	0.00	8.9	0.60	0.01	0.12	0.005	0.16	19.2	0.88
Number of Samples (N)	6	0.02	6	0.2	6	0.2	6	0.4	6	0.1	6	0.2	6	0.00	6	0.4	6	0.01	6	0.03	6	0.8
Student's t statistic (0.2) Alpha	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Student's t statistic (0.1) Beta	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476	1.476
H statistic[1]		1.48		1.8		1.8		1.977		1.67		1.8		1.42		1.9		1.41		1.48		2.5
Mean Concentration (ppb)	5.333	1.666	3.1	1.037	9.867	2.204	2.9	0.905	6.767	1.869	4.583	1.437	0.1	-2.303	6.767	1.790	1.15	0.134	0.393	-0.945	6	1.498
Action Level[2] (ppb)	200	5.298	50	3.912	2000	7.601	5	1.609	100	4.605	15	2.708	2	0.693	140	4.942	50	3.912	183	5.209	21900	9.994
Minimum Number of Samples for 90% Confidence Limit[3]	1	1	1	1	1	1	6	5	1	1	1	2	1	1	1	1	1	1	1	1	1	1
90% Upper Confidence Limit (UCL)[4] (ppb)	6	6	4	5	12	15	4	5	8	9	6	7	0	0	9	12	1	1	0	0	9	18

[1] Table A10 (Gilbert, 1987)
[2] RFCA Table 2 - Ground Water Action Levels - Tier 2
[3] EPA G-4, Appendix C (EPA, 1993)
[4] Calculated using Beta t-statistic for normal and H statistic for log-normal.

ATTACHMENT 10

SUMMARY OF ENVIRONMENTAL DOCUMENTS

Table 1 – Summary of Environmental Documents for the B788 Project*

	DOCUMENT TITLE	DOCUMENT NUMBER	DOCUMENT AUTHOR(S)	DATE PREPARED OR APPROVED	DOCUMENT DESCRIPTION AND COMMENTS
1	Environmental Checklist	NA	R. E. Fiehweg	October 21, 1998	RMRS prepared summary of environmental conditions for K-H review and use in preparing the NEPA documentation for DOE.
2	NEPA – Categorical Exclusion Determination	RFFO/CX18-98	DOE		Categorical exclusion issued by DOE.
3	Closure Description Document for RCRA Units 21 and 48	RF/RMRS-98-288	R. E. Fiehweg	January 15, 1999	The document describing how the RCRA units will be closed in compliance with the applicable closure plans. It specifically identified how waste would be disposed, and how the units would meet the closure standards set forth in the plans.
4	Site Hazard Assessment Report for Buildings 788 and 207A Clarifier	RF/RMRS-98-299.UN	G. Digregorio, S. Luker	March 25, 1999	The summary report of all hazards presented by the project, including radiological levels, asbestos, and PCBs.
5	Radiological History Assessment for the 207 Cluster	NA	M. Rodriguez	September 22, 1998	A summary document presenting a preliminary review of historical knowledge a radiological levels in the project area.
6	Rocky Flats Building 788 Cluster RCRA Closure Project Project Execution Plan	RF/RMRS-98-276	E. Bentsen	March 8, 1999	This document outlined the organization of the project and

	DOCUMENT TITLE	DOCUMENT NUMBER	DOCUMENT AUTHOR(S)	DATE PREPARED OR APPROVED	DOCUMENT DESCRIPTION AND COMMENTS
					personnel, the work that was to be done, and incorporated a number of the regulatory description documents.
7	Sampling and Analysis Plan for Clean Closure of the B788 Concrete Slab	NA	K. Kelly		This document describes specifically how the floor cleaning operations would be conducted, including a description of the selection of random grid components, special areas, and the treatment of data once analytical results were obtained.
8	Waste management Plan For the Building 788 Cluster Decommissioning project	RMRS/OPS-PRO.097	E. Bentsen	December 28, 1999	This document provided a summary of the types of wastes expected from project activities, the anticipated disposal of each type of waste, and a description of the duties of the various personnel involved in the generation, identification, packaging and disposal of the waste.

* The B788 Project scope included the removal of Building 788 and the pondcrete processing equipment. The clarifier tank had previously been emptied of residual pondcrete, washed, rinsed, and clean closed to standards agreed to by CDPHE.

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ATTACHMENT 11

LESSONS LEARNED

Lessons Learned

The Building 788 Closure Project was completed without serious personal injuries or environmental impact. The project experienced several unknown site conditions, which impacted the budget and schedule. Provided below is a summary of the lessons learned:

- The safety performance throughout the project was well managed. All team members always gave safety top priority. However, attention to detail and communication between project personnel decreased near completion of the field activities. There were miscommunications, which resulted in a small amount of liquid into the surrounding environment. Soil sampling was needed to confirm that a release of contamination to the environment did not occur.

  Additionally, personnel were reassigned prior to completion of the project. In some cases, this extended field activities and created communication problems due to lack of key personnel.

  Lesson learned: Safety awareness and communication must be given highest priority from the start of the project through the completion of all field activities. This must be reinforced at the POD and at the Toolbox meetings.

- During the strip-out and demolition phases of the Building 788 Cluster, several delays were incurred due to acquiring proper notification of facilities and appropriate signatures/reviews prior to work beginning. The review of IWCP procedures and approved signatures are essential prior to performing work. It should be noted that ample time to acquire signoffs and reviews should be included in project schedule and budget. Concurrence signatures should be coordinated in a timely manner so that downtime and delays are limited and do not impact schedule or contractors abilities to start work. For D&D projects, the emphasis is primarily for utility terminations (LO/TO) and/or modifications that affect other buildings. In addition, signatures and/or approval from Shift Manager/Configurations Control Authorities, Operations Review Committee (ORC) / Process Review Committee (PRC) review or waiver, and Authorization Basis screen for any buildings involved in modifications, all have a direct impact on schedule and should be included in the initial planning and project budget.

  Lesson learned: Appropriate time is needed to acquire signatures and reviews prior to beginning work. It should be noted that additional costs are incurred when supporting organizations are needed for Lock Out /Tag Out (LO/TO) and/or contractors are delayed when signatures are not acquired on time.

- Building 788 Demolition and Closure was completed several weeks early. There were significant delays accrued to RMRS by the subcontractor due to lack of Supervision, prolonged pre-evolutions (i.e., discussions not within project scope and new time card procedures) and improper safety coverage during the course of the project. In addition to the subcontractors inability to provide a full time safety officer, the safety officer who was assigned was "uncleared" and had to have an escort. This made it difficult for the safety officer to "cover" several areas at a time, due to the confines of the escort procedures.

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Lesson learned: It is prudent to keep the focus of the pre-evolutions in direct relation to the scope of the project and having the appropriate assigned personnel available to support evolutions. This will enable the subcontractor to be more efficient and ensure all workers are properly supervised.

- During the planning phase, characterization of Building 788 for the SHAR was delayed due to lack of coordination between supporting groups. Once sampling was completed, the results for the samples were delayed by the lab's inability to meet schedules. Turn-around delays and the additional sampling that was required throughout the project impacted the schedule and caused several revisions to the SHAR.

  Lesson learned: Coordination between the Characterization Group, Sampling Team, Project Planners, and the Labs ability to process samples must be demonstrated to keep impacts on budget and schedule to a minimum.

- There were misinterpretations by direct communications (i.e., "he said, she said"). The use of the site email system ensures all communications are documented as to who sent and received the letter, and the dates and times sent.

  Lesson learned: Documentation of all verbal agreements and conversations between private parties enables a source for referencing at a later date.

- During strip-out of the process pipeline inside B788, a subcontractor (pipefitter) was injured by a section of the pipe when the hangers slipped off the ceiling I-beam and landed on his forearm. The work was being performed inside a posted Contaminated Area (CA). A Radiological Work Permit (RWP) was in use. The glove-bags were utilized during cutting of the pipe and a mock-up was performed prior to making bag-cuts. The pipefitters stated that during the pipe removal, one end of the pipe slipped out of its hanger and the second hanger (closest to the pipefitter who got injured) slipped off the ceiling I-beam and came down with the pipe (hanger still intact), hitting the worker. A fact-finding meeting was held and one corrective action was for the pipefitters to inspect all remaining hangers prior to removing remaining sections. The installment of additional hangers and/or rope to support overhead pipes during removal would be implemented per inspections. It was also noted that many of the existing buildings on the RFETS site do not have the correct hangers installed to support overhead piping and/or utilities.

  Lesson learned: Prior to strip-out of any overhead process lines or utilities, a walk-down should be completed by engineering and the craft workers to inspect all hangers. Installation of additional supports should be implemented per the walkdown findings. Precautions should be taken into consideration prior to removal during D&D operations.

- Another incident involving process pipe removal within a CA, resulted in a Radiological Improvement Report (RIR). A spill of less than 1 pint of process liquids, occurred as a result of the use of improper glove-bags and tape by the subcontractor. The spill was cleaned up and it was determined by Radiological Operations that no contamination to the environment had occurred. A fact finding meeting was held. Discussions ensued regarding the method of bag-cut, type of

glove-bag and tape for glove-bags. This was not in the subcontractors approved plans for cut and removal. The subcontractor was in violation and instructed to acquire the appropriate glove-bags and rated tape to comply with approved plans.

Lesson learned: Procedural Compliance is to be followed at all times with no exceptions at RFETS, and must be demonstrated for every evolution.

- The SHAP did not include characterization for Beryllium (Be). The SHAR did not have any information regarding Be as a hazard for this project. When the Subcontractor raised the concern of potential Be contamination, results from a routine survey of the Contamination Control Room were above allowable limits. Reviewing existing characterization of the SEP sludge found potential Be contamination in Building 788 and the Clarifier piping. Building 788 and the SEPs were included on the site list of facilities with potential Be contamination. If existing characterization data had been reviewed during the planning phase, delays and subcontractor claims would have been avoided.

  Lessons Learned: All potential hazards need to be evaluated during characterization. The project team needs to be thorough when filling out the Job Hazards Analysis Checklist, which has a specific question regarding Be.

ATTACHMENT 12

RADIOLOGICAL REPORT

Radiological Characterization of Surface Contaminated Objects (SCO):

The Building 788 Cluster, consisting of Building 788, Trailer 788A, Pump House 308A, Tank 207A, and various pieces of ancillary equipment, was surveyed in accordance with PRO-267-RSP-09.05, *Radiological Characterization of Surface Contaminated Objects*. This procedure prescribes the techniques and methodologies employed at Rocky Flats Environmental Technology Site to demonstrate compliance with Department of Transportation regulation 49 CFR 173, Subpart I.

The Building 788 Cluster was divided into ten SCO Characterization Survey Units (See Table 1). All characterization units were qualified under the SCO I categorization based on the limits established for SCO I and/or application of a permanent fixative. Detailed radiological survey results and applicable SCO documentation are contained in "The Site Hazard Assessment Report for Buildings 788 & 207A Clarifier," RF/RMRS-98-299.UN, Revision 1. Appendix 12-A of this report provides the information for SCO I determination for each SCO Characterization Survey Unit.

Table 1. Building 788 Cluster SCO Characterization Survey Units

Characterization Survey Unit	Location
SCO-788-01-WI	Building 788 Interior Walls
SCO-788-02-RI	Building 788 Ceiling
SCO-788-03-CCR	Building 788 Contamination Control Room
SCO-788-06-WE	Building 788 Exterior Walls
SCO-788-07-RE	Building 788 Exterior Roof
SCO-207-01-CI	Clarifier Tank Interior Walls
SCO-207-02-CW	Clarifier Tank Catwalk
SCO-308A-02-WE	Building 308A (Pump House) Exterior Walls
SCO-EQU-01-PMCM	Pug Mill and Cement Mixer
SCO-SPD-001	Solar Pond Debris

Radiological Surveys of 788 Cluster Concrete Pads:

B788 Pad

Removable and total contamination surveys were performed on the pad of Building 788. Fixed alpha contamination was identified on approximately 80 percent of the slab's surface. For detailed survey results refer to "The Site Hazard Assessment Report for Buildings 788 & 207A Clarifier," RF/RMRS-98-299.UN, Revision 1. To rule out the presence of naturally occurring radioactivity, Benchmark Environmental Corporation was contracted to perform gamma spectroscopy of the affected area. Gamma spectroscopy analysis was performed on 24 of the most highly contaminated 100 cm^2 grids. The analysis failed to provide conclusive data that indicated the source of activity was

naturally occurring. Without data suggesting otherwise, the source of contamination was assumed to result from Site operations and therefore controls were implemented to protect the pad and mitigate the spread of contamination and generation of airborne radioactivity during demolition activities.

Based on the above, approximately six to eight inches of road base soil was applied to the surface of the pad. A baseline sample was collected from the road base soil prior to work being conducted. Isotopic analysis was performed on the sample, see Table 2 for isotopic data.

Table 2. Baseline radioanalytical results from road base soil.

Radionuclide	Activity (pCi/g)	Minimum Detectable Activity (pCi/g)	Uranium Total (pCi/g)	Transuranic Total (pCi/g)
U-233/234	0.771	0.065		
U-235	0.050	0.046		
U-238	0.849	0.065	1.67	
Pu-239/240	0.061	0.083		
Am-241	0.065	0.044		0.126

Two locations, North (Location A) and South West (Location B) of the Clarifier pad, were set up as size reduction areas for various building parts, piping, and equipment (Figure 1). Location A was used mostly for the size reduction of the Clarifier Tank and Location B was used for the reduction of Building 788, the Pug Mill, piping, and miscellaneous pieces of equipment. Upon the completion of the demolition activities, 14 soil samples at different depths were chosen from the two areas (Figure 2) and analyzed for gross alpha and gross beta contamination and isotopic constituents (Tables 3 and 4 respectively).

The gross alpha and beta activity for the 14 sample locations, ranging in depths from surficial to approximately five inches, were all above the Minimum Detectable Activity (MDA). No correlation of contamination could be determined from Location A or Location B, nor could the contamination be limited to a certain depth.

A comparison of the isotopic total uranium and total Transuranic activities to the background sample indicates Pu-239/240 and Am-241 contamination. Site locations 4A, 5A, 10B, 12B, 13B, and 14B appear to be well above the background levels and indicate contamination from size reduction activities. However, due to only one background characterization sample analyzed, statistical analysis would not be suitable for this situation. See Appendix 12-B for analytical results.

Contamination Control Room

The Contamination Control Room (CCR) is located within Building 788 (Figure 1). Surveys of the CCR concrete pad indicate removable and fixed alpha contamination on

100 percent of the 100 cm^2 grids. The removable alpha contamination was decontaminated from the concrete pad and protected from demolition activities by application of 6 inches of road base soil.

Having reached completion of demolition activities, the CCR pad was uncovered for a final RCRA rinse. The soil was placed on the West side of the pad where the cement mixer once resided (approximately three feet deep). The rinse was performed using a high power pressure wash of 1800 psi, which is capable of removing fixed contamination. Approximately 1-2 gallons of the rinse water flowed into the soil west of the CCR Pad. The pad was covered again with new soil before contamination surveys could be performed.

Twelve samples at various depths (Figure 3) were taken from the west location of the CCR pad. Gross alpha and beta analysis and radioisotopic analysis were performed on the samples (Tables 5 and 6 respectively).

The 12 samples were taken from four locations ranging in depths from surficial to approximately two feet. Except for sample location 201B, (alpha), all sample results were above the MDA for gross alpha and beta. Again there appears to be no pattern of contamination relating to location, or limited to a certain depth.

The isotopic analysis from the CCR area indicates Pu-239/240 and Am-241 contamination at sample locations 201, 201A and possibly location 401. It is assumed from the isotopic data that there may be a correlation between contamination and depth since contamination was only detected at the surface and within the first six inches. As previously stated, due to only one background sample analyzed, statistical testing would be difficult to perform. See Appendix 12-B for analytical data.

B308A Pad

The Pump House 308A concrete pad was surveyed for removable and total alpha and beta/gamma contamination prior to and after the demolition of Building 308A. No removable or total contamination was detected above Table 2-2 of the RFETS Radiological Control Manual.

Clarifier Tank 207A Pad

Prior to demolition, accessible areas of the concrete pad were surveyed. Fixed contamination was detected and an epoxy coating, most likely applied during the operation period of the clarifier tank, was noticed on various areas of the pad. Characterization surveys were conducted on the concrete pad after the demolition of the clarifier tank. Removable and total alpha contamination were detected. The removable alpha contamination was decontaminated from the pad and the area posted accordingly.

Within weeks, the epoxy coating began to peel in several locations on the exposed pad. The loose coating was scraped from the surface of the pad and two coats of weather-resistant epoxy fixative were applied to the clarifier pad.

Final Radiological Postings:

In accordance with the RFETS Radiological Control Manual and DOE Order 5400.5, the entire 788 Pad is radiologically posted as a "Underground Radioactive Material Area." The posting is required due to the fixed contamination detected on the Building 788 Pad. The road base soil is to remain in place providing coverage of the pad.

Based on the analytical sample data from Locations A and B of the size reduction areas and the CCR area, the detectable concentrations are below the Tier II values (38 pCi/g). The areas will not be required to be posted as a "Soil Contamination Area," however, for future reference, alpha contamination has been detected from these areas.

The clarifier tank pad is posted as a fixed contamination area and has been set on a survey frequency in accordance with 3-PRO-164-RSP-07.01, *Radiation, Contamination, and Airborne Radioactivity Survey Frequency.*

Property/Waste Release Evaluations (P/WRE) – RSFORMS-09.01-01:

Various items located within the 788 Cluster were free-released in accordance with 1-P73-HSP-18.10, *Radioactive Material Transfer and Unrestricted Release of Property and Waste*, 3-PRO-141-RSP-09.01, *Unrestricted Release of Property, Material, Equipment, and Waste*, and 3-PRO-140-RSP-09.03, *Unrestricted Release of Bulk or Volume Material.*

Items such as office equipment, unused supplies, batteries, aerosol cleaners, and rental equipment used for the demolition of the 788 Cluster, were free-released based on removable and total alpha and beta release limits (See Table 2-2 of the RFETS Radiological Control Manual).

As of September 1, 1999, all original P/WREs (RSFORMS-09.01-01) associated with the closure of the 788 Cluster can be located at the Radiological Records Retention Center located in Trailer 130B.

Table 3 – Building 788 Size Reduction Area Gross Alpha and Gross Beta Soil Sample Results

Location Description /Depth	Sample Location Number	Site Sample ID RIN Number 99A9499	Activity (pCi/g)	MDA (pCi/g)	Activity (pCi/g)	MDA (pCi/g)
Location A Two Inches	1A	001.002	15	5	22	2
Location A Surficial	2A	002.002	16	5	25	2
Location A Four Inches	3A	003.002	14	4	25	2
Location A Five Inches	4A	004.002	20	5	29	2
Location A Two Inches	5A	005.002	12	5	23	2
Location A Three Inches	6A	006.002	15	5	24	2
Location B Three Inches	7B	007.002	14	5	27	2
Location B Two Inches	8B	008.002	11	5	19	2
Location B Four Inches	9B	009.002	12	5	20	2
Location B Three Inches	10B	010.002	15	5	21	1
Location B Three Inches	11B	011.002	10	5	18	2
Location B Surficial	12B	012.002	11	4	20	2
Location B Two Inches	13B	013.002	13	5	20	2
Location B Five Inches	14B	014.002	15	5	20	2

Table 4 - Building 788 Size Reduction Area
Isotopic Soil Sample Results

LOCATION DESCRIPTION/Depth	SAMPLE LOCATION NUMBER	SITE SAMPLE ID RIN Number 99A9499	NUCLIDE	pCi/g	MDA (pCi/g)	URANIUM TOTAL (pCi/g)	TRANSURANIC TOTAL (pCi/g)
Location A Two Inches	1A	001.002	U-233/234	0.721	0.074		
			U-235	0.097	0.044		
			U-238	0.911	0.035	1.7	
			Pu-239/240	0.305	0.046		
			Am-241	0.735	0.044		1.0
Location A Surficial	2A	002.002	U-233/234	0.630	0.036		
			U-235	0.049	0.044		
			U-238	0.627	0.035	1.3	
			Pu-239/240	0.094	0.080		
			Am-241	0.469	0.042		0.6
Location A Four Inches	3A	003.002	U-233/234	0.524	0.034		
			U-235	0.046	0.042		
			U-238	0.847	0.070	1.4	
			Pu-239/240	0.113	0.044		
			Am-241	0.111	0.043		0.2
Location A Five Inches	4A	004.002	U-233/234	0.820	0.061		
			U-235	0.063	0.042		
			U-238	1.070	0.061	2.0	
			Pu-239/240	4.130	0.049		
			Am-241	8.270	0.042		12.4
Location A Two Inches	5A	005.002	U-233/234	0.848	0.066		
			U-235	0.034	0.046		
			U-238	0.693	0.066	1.6	
			Pu-239/240	0.892	0.049		
			Am-241	2.400	0.045		3.3
Location A Three Inches	6A	006.002	U-233/234	0.635	0.063		
			U-235	0.032	0.044		
			U-238	0.521	0.035	1.2	
			Pu-239/240	0.191	0.047		
			Am-241	0.694	0.043		0.9
Location B Three Inches	7B	007.002	U-233/234	0.904	0.040		
			U-235	0.036	0.049		
			U-238	0.936	0.070	1.9	
			Pu-239/240	0.235	0.042		
			Am-241	0.739	0.046		1.0

Table 4 - Building 788 Size Reduction Area
Isotopic Soil Sample Results

LOCATION DESCRIPTION/Depth	SAMPLE LOCATION NUMBER	SITE SAMPLE ID RIN Number 99A9499	NUCLIDE	pCi/g	MDA (pCi/g)	URANIUM TOTAL (pCi/g)	TRANSURANIC TOTAL (pCi/g)
Location B Two Inches	8B	008.002	U-233/234	0.802	0.078		
			U-235	0.051	0.046		
			U-238	0.644	0.037	1.5	
			Pu-239/240	0.154	0.046		
			Am-241	0.349	0.045		0.5
Location B Four Inches	9B	009.002	U-233/234	0.730	0.073		
			U-235	0.032	0.043		
			U-238	0.797	0.062	1.6	
			Pu-239/240	0.136	0.041		
			Am-241	0.703	0.079		0.8
Location B Three Inches	10B	010.002	U-233/234	0.971	0.036		
			U-235	0.049	0.044		
			U-238	0.806	0.036	1.8	
			Pu-239/240	0.691	0.044		
			Am-241	0.686	0.042		1.4
Location B Three Inches	11B	011.002	U-233/234	0.687	0.037		
			U-235	0.119	0.046		
			U-238	0.701	0.077	1.5	
			Pu-239/240	0.214	0.098		
			Am-241	0.450	0.044		0.7
Location B Surficial	12B	012.002	U-233/234	0.649	0.067		
			U-235	0.069	0.047		
			U-238	0.632	0.066	1.4	
			Pu-239/240	0.389	0.095		
			Am-241	0.925	0.048		1.3
Location B Two Inches	13B	013.002	U-233/234	0.901	0.086		
			U-235	0.034	0.046		
			U-238	0.952	0.066	1.9	
			Pu-239/240	0.647	0.085		
			Am-241	1.990	0.042		2.6

Table 4 - Building 788 Size Reduction Area
Isotopic Soil Sample Results

LOCATION DESCRIPTION/Depth	SAMPLE LOCATION NUMBER	SITE SAMPLE ID RIN Number 99A9499	NUCLIDE	pCi/g	MDA (pCi/g)	URANIUM TOTAL (pCi/g)	TRANSURANIC TOTAL (pCi/g)
Location B Five Inches	14B	014.002	U-233/234	1.080	0.063		
			U-235	0.081	0.044		
			U-238	0.998	0.036	2.2	
			Pu-239/240	0.809	0.108		
			Am-241	1.970	0.047		2.8

Min =	**1.2**	**0.2**
Max =	**2.2**	**12.4**
Avg =	**1.6**	**2.1**
sd =	**0.3**	**3.1**

Table 5 – Building 788 Contamination Control Room Gross Alpha and Gross Beta Soil Sample Results

			Gross Alpha		Gross Beta	
Depth	Sample Location Number	Site Sample ID RIN Number 99A9037	Activity (pCi/g)	MDA (pCi/g)	Activity (pCi/g)	MDA (pCi/g)
Surficial	101	001.002	8.2	3.7	19	3
Two Feet	101A	002.002	8.9	3.7	18	2
Surficial	201	003.002	21	4	19	3
Six Inches	201A	004.002	10	4	20	3
One Foot	201B	005.002	2.5	3.5	20	2
Two Feet	201C	006.002	7.6	3.4	19	2
Surficial	301	007.002	11	5	25	1
Six Inches	301A	008.002	9.4	4.8	23	2
One Foot	301B	009.002	10	5	25	1
Two Feet	301C	010.002	11	4	22	1
Surficial	401	011.002	12	4	23	2
Two Feet	401A	012.002	10	4	24	2

Table 6 - Building 788
Contamination Control Room Pad Soil Sample Results

LOCATION DESCRIPTION/Depth	SAMPLE LOCATION NUMBER	SITE SAMPLE ID RIN NUMBER 99A9037	NUCLIDE	pCi/g	MDA (pCi/g)	URANIUM TOTAL (pCi/g)	TRANSURANIC TOTAL (pCi/g)
Surficial	101	001.002	U-233/234	0.982	0.160		
			U-235	0.001	0.196		
			U-238	1.730	0.179	2.7	
			Pu-239/240	0.070	0.250		
			Am-241	0.114	0.077		0.2
Two Feet	101A	002.002	U-233/234	0.066	0.222		
			U-235	0.022	0.142		
			U-238	0.791	0.190	0.9	
			Pu-239/240	0.014	0.161		
			Am-241	0.029	0.078		0.0
Surficial	201	003.002	U-233/234	1.330	0.211		
			U-235	0.022	0.145		
			U-238	1.390	0.079	2.7	
			Pu-239/240	4.150	0.139		
			Am-241	15.600	0.143		19.8
Six Inches	201A	004.002	U-233/234	1.020	0.238		
			U-235	0.009	0.218		
			U-238	1.930	0.238	3.0	
			Pu-239/240	0.884	0.264		
			Am-241	2.890	0.205		3.8
One Foot	201B	005.002	U-233/234	0.662	0.275		
			U-235	0.008	0.200		
			U-238	1.270	0.178	1.9	
			Pu-239/240	0.024	0.160		
			Am-241	0.057	0.077		0.1
Two Feet	201C	006.002	U-233/234	0.507	0.236		
			U-235	0.008	0.201		
			U-238	0.845	0.082	1.4	
			Pu-239/240	0.061	0.083		
			Am-241	0.135	0.142		0.2
Surficial	301	007.002	U-233/234	0.601	0.145		
			U-235	0.044	0.172		
			U-238	0.862	0.145	1.5	
			Pu-239/240	0.095	0.160		
			Am-241	0.157	0.136		0.3

Table 6 - Building 788
Contamination Control Room Pad Soil Sample Results

LOCATION DESCRIPTION/Depth	SAMPLE LOCATION NUMBER	SITE SAMPLE ID RIN NUMBER 99A9037	NUCLIDE	pCi/g	MDA (pCi/g)	URANIUM TOTAL (pCi/g)	TRANSURANIC TOTAL (pCi/g)
Six Inches	301A	008.002	U-233/234	0.605	0.233		
			U-235	0.043	0.167		
			U-238	0.857	0.167	1.5	
			Pu-239/240	0.029	0.188		
			Am-241	0.111	0.202		0.1
One Foot	301B	009.002	U-233/234	1.060	0.350		
			U-235	0.090	0.109		
			U-238	1.270	0.367	2.4	
			Pu-239/240	0.077	0.106		
			Am-241	0.072	0.099		0.1
Two Feet	301C	010.002	U-233/234	0.360	0.131		
			U-235	0.014	0.155		
			U-238	0.929	0.155	1.3	
			Pu-239/240	0.063	0.247		
			Am-241	0.054	0.233		0.1
Surficial	401	011.002	U-233/234	0.674	0.237		
			U-235	0.037	0.191		
			U-238	0.880	0.143	1.6	
			Pu-239/240	0.090	0.211		
			Am-241	0.448	0.195		0.5
Two Feet	401A	012.002	U-233/234	0.654	0.170		
			U-235	0.000	0.170		
			U-238	0.927	0.116	1.6	
			Pu-239/240	-0.007	0.144		
			Am-241	0.073	0.066		0.1

Min =	**0.9**	**0.0**
Max =	**3.0**	**19.8**
Avg =	**1.9**	**2.1**
sd =	**0.7**	**5.7**

ATTACHMENT 12A

RADIOLOGICAL CHARACTERIZATION FOR SURFACE CONTAMINATED OBJECTS

CASE NARRATIVE
RIN 99A7349
Laboratory Report Identification Number: 1587
PSA Module RC01B.3

June 22, 1999

I. Introduction

On June 2, 1999, one soil sample, (RIN 99A7349), was received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The sample was analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by Eichrom Industries, Inc. extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

None.

Matrix Interferences

There were no indications of matrix interference.

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses.

Reanalysis

There were no reanalysis.

Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

IV. Quality Control

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1583-LC1	Laboratory Control Sample
Laboratory Type II Water	SCAQC-1583-PB	Preparation Blank
99A6817-001.003 4.2 903 Pad BH96598	SCAQC-1583-LD1	Laboratory Duplicate Sample

This sample received on 6/2/99, RIN 99A7349 (Batch No. 1587), was analyzed concurrently with six soil samples received on 5/28/99, RIN 99A6817, (Batch No. 1583). Therefore, the Laboratory Control Sample (SCAQC-1583-LC1), the Laboratory Duplicate Sample (SCAQC-1583-LD1), and the Preparation Blank (SCAQC-1583-PB) were used as quality control samples for both sample batches.

The analytical results of all quality control samples met the acceptance criteria specified in the SOW.

Sincerely,

Joe Stinson
Laboratory Manager

6/22/99
Date

Commodor[illegible] .dvanced Sciences, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99..7349#002

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[redacted]

99A7349

	Contact/Requester: NELSON, M.J.	Telephone No.: 7647	MSIN / FAX
	Sampling Origin: Bldg. 788	Purchase Order/Charge Code: MA78CH10	
Project Title: N/A	Logbook No.: 92 Vaq	Ice Chest No.: N/A	Temp.
To (Lab): S. Cohen & Associates	Method of Shipment: N/A Fed Ex	Bill of Lading/Air Bill No.: 4533 2124 7816	
Protocol: CAS-SOP. 003		Offsite Property No.	

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☐ No ☐

KH199-1587-

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative; Packing
99A7349-001.002	B788	SOLID	5/20/99	8:40	ROAD BASE (DIRT/GRAVEL)	125-G P/G	RC01B003 (Isotopic (Soil)) [Routine] 01	None 4 degrees C

5/20/99 MDV

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Hand Carry	5/20/99 10:00	TB91R Box #2	5/20/99 10:00	Refrigerator #2	6/1/99 1345		6/1/99 1345
	6-1-99 1500	FedEx					6/2/99 1000

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A7349

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A7349#002	Matrix:	Soil
Site Sample ID:	001.002				
Other Sample ID:	Road Base (Dirt/Gravel)	Collection Date:	5/20/99	Date Received:	6/2/99
		Batch Number:	1587	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1587-01	0.771	0.218	0.267	0.065
ACW03	U-235	KH199-1587-01	0.050	0.058	0.060	0.046
ACW03	U-238	KH199-1587-01	0.849	0.229	0.285	0.065
ACW03	PU-239/240	KH199-1587-01	0.061	0.068	0.069	0.083
ACW03	AM-241	KH199-1587-01	0.065	0.066	0.067	0.044

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1583-LC1	SCAQC-1583-LD1	SCAQC-1583-PB
Pu	SCAQC-1583-LC1	SCAQC-1583-LD1	SCAQC-1583-PB
Am	SCAQC-1583-LC1	SCAQC-1583-LD1	SCAQC-1583-PB

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number: 99A7349

Project Name: Kaiser-Hill Laboratory Code: SCA

Laboratory Contol Sample (LC1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	(CV) Decay Corrected Activity of Spike Added (dpm)	(OV) Laboratory Control Sample Activity (dpm)	Laboratory Control Sample % Recovery (Accuracy)	Number of σ Between CV and OV
ACW03	AM-241	SCAQC-1583-LC1	4.24 ∓ 0.117	4.39 ∓ 1.18	103	0.197
ACW03	PU-239/240	SCAQC-1583-LC1	4.55 ∓ 0.100	5.32 ∓ 1.36	117	0.885
ACW03	U-233/234	SCAQC-1583-LC1	8.02 ∓ 0.321	8.35 ∓ 1.96	104	0.244
ACW03	U-238	SCAQC-1583-LC1	8.02 ∓ 0.321	9.20 ∓ 2.14	115	0.809

Laboratory Duplicate Sample (LD1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	Original Sample Activity (pCi/g)	Duplicate Sample Activity (pCi/g)	Difference Between Original Activity and Duplicate Sample Activity (F)	Ratio of the Difference Between the Sample Activities and the Propagated Measurement Original Activity and Uncertainty of the Difference at 2 σ (F/E)
ACW03	U-233/234	SCAQC-1583-LD1	0.417 ∓ 0.175	0.409 ∓ 0.168	0.008	0.031
ACW03	U-235	SCAQC-1583-LD1	0.033 ∓ 0.047	0.000 ∓ 0.000	0.033	0.690
ACW03	U-238	SCAQC-1583-LD1	0.389 ∓ 0.168	0.442 ∓ 0.180	0.053	0.217
ACW03	PU-239/240	SCAQC-1583-LD1	0.071 ∓ 0.072	0.046 ∓ 0.061	0.025	0.264
ACW03	AM-241	SCAQC-1583-LD1	0.000 ∓ 0.000	0.015 ∓ 0.030	0.015	0.496

CASE NARRATIVE
RIN 99A9499
Laboratory Report Identification Number: 1684, 1685
PSA Module RC01B.3

September 14, 1999

I. Introduction

On September 1, 1999, 14 soil samples, (RIN 99A9499), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The chain-of-custody accompanying the sample requested that it be analyzed on a "rush" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by Eichrom Industries, Inc. extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

None.

Matrix Interferences

There were no indications of matrix interference.

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses.

Reanalysis

There were no reanalysis.

Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

IV. Quality Control

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1684-LC1	Laboratory Control Sample
99A9499-001.002 Bldg 788 Pad	SCAQC-1684-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1684-PB	Preparation Blank

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1670-LC1	Laboratory Control Sample
99A9457-005.003 Bldg 891 Filter Press (RS8)	SCAQC-1670-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1670-PB	Preparation Blank

Four of these soil samples received on 9/1/99, RIN 99A9499 (Batch No. 1685), were analyzed concurrently with one soil sample received on 8/20/99, RIN 99A9457, (Batch No. 1670). Therefore, the Laboratory Control Sample (SCAQC-1670-LC1), the Laboratory Duplicate Sample (SCAQC-1670-LD1), and the Preparation Blank (SCAQC-1670-PB) were used as quality control samples for both sample batches.

The analytical results of all quality control samples met the acceptance criteria specified in the SOW.

Sincerely,

Joe Stinson
Laboratory Manager

6/14/99
Date

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RFETS

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99[illegible]499#002

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Collector J Wagerd	Contact/Requester SZYDLOWSKI, TOM	Telephone No. 8165 MSIN FAX
RIN 99A9499	Sampling Origin Bldg 788 Pad	Purchase Order/Charge Code MA78CH10
Project Title NA	Logbook No. 94 VAN	Ice Chest No. NA Temp.
To (Lab) S. Cohen & Associates	Method of Shipment CAS	Bill of Lading/Air Bill No. 4533 2125 0593
Protocol CAS-SOP-003		PRE

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☐ No ☐

KH199-1684-

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative ; Packing
99A9499-001.002	NA	SOLID	8/24/99	1250	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 01	None None
99A9499-002.002		SOLID		1251	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 02	None None
99A9499-003.002		SOLID		1252	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 03	None None
99A9499-004.002		SOLID		1300	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 04	None None
99A9499-005.002		SOLID		1257	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 05	None None
99A9499-006.002		SOLID		1253	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 06	None None
99A9499-007.002		SOLID		1310	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 07	None None

Relinquished By: / Date/Time	Received By: / Date/Time	Relinquished By: / Date/Time	Received By: / Date/Time
J Wagerd CAS 8/24/99 1610	Fridge #2 CAS T691R 8/24/99 1610	Fridge #2 CAS T691R 8-31-99 1400	L. Miller 8-31-99 1400
L. Miller 8-31-99 1500	Fed Ex		Stisher BCA 9-1-99/0900

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

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Commodor. Ivanced Sciences, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99[illegible]499#002

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RIN	Contact/Requestor	Telephone No.	MSIN	FAX
99A9499	SZYDLOWSKI, TOM	8165		

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis KH199-1684	Preservative ; Packing
99A9499-008.002	NA	SOLID	8/24/99	1312	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 08	None None
99A9499-009.002		SOLID		1345	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 09	None None
99A9499-010.002		SOLID		1315	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 10	None None
99A9499-011.002		SOLID		1320	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] KH199-1685-01	None None
99A9499-012.002		SOLID		1347	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 02	None None
99A9499-013.002		SOLID		1346	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 03	None None
99A9499-014.002		SOLID		1342	Bldg 788 Pad	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 04	None None

SW 8/24/99

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
J Wingard CAS	8/24/99 1610	Fridge #2 CAS T891R	8/24/99 1610	Fridge #2 CAS T891R	8-31-99/1400	G. Miller	8-31-99/1400
G. Miller	8-31-99/1500	Fed Ex				S Fisher/SC:9	9-1-99/0900

FINAL SAMPLE DISPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	001.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/29/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-01	0.721	0.207	0.252	0.074
ACW03	U-235	KH199-1684-01	0.097	0.079	0.085	0.044
ACW03	U-238	KH199-1684-01	0.911	0.233	0.296	0.035
ACW03	PU-239/240	KH199-1684-01	0.305	0.150	0.162	0.046
ACW03	AM-241	KH199-1684-01	0.735	0.240	0.282	0.044

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	002.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-02	0.630	0.191	0.228	0.036
ACW03	U-235	KH199-1684-02	0.049	0.056	0.058	0.044
ACW03	U-238	KH199-1684-02	0.627	0.190	0.228	0.035
ACW03	PU-239/240	KH199-1684-02	0.094	0.084	0.086	0.080
ACW03	AM-241	KH199-1684-02	0.469	0.182	0.205	0.042

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	003.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-03	0.524	0.168	0.198	0.034
ACW03	U-235	KH199-1684-03	0.046	0.053	0.055	0.042
ACW03	U-238	KH199-1684-03	0.847	0.219	0.277	0.070
ACW03	PU-239/240	KH199-1684-03	0.113	0.087	0.090	0.044
ACW03	AM-241	KH199-1684-03	0.111	0.085	0.088	0.043

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	004.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-04	0.820	0.218	0.273	0.061
ACW03	U-235	KH199-1684-04	0.063	0.063	0.066	0.042
ACW03	U-238	KH199-1684-04	1.07	0.252	0.331	0.061
ACW03	PU-239/240	KH199-1684-04	4.13	0.800	1.15	0.049
ACW03	AM-241	KH199-1684-04	8.27	1.29	2.10	0.042

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	005.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-05	0.848	0.231	0.286	0.066
ACW03	U-235	KH199-1684-05	0.034	0.048	0.049	0.046
ACW03	U-238	KH199-1684-05	0.693	0.206	0.248	0.066
ACW03	PU-239/240	KH199-1684-05	0.892	0.285	0.336	0.049
ACW03	AM-241	KH199-1684-05	2.40	0.515	0.704	0.045

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	006.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-06	0.635	0.192	0.230	0.063
ACW03	U-235	KH199-1684-06	0.032	0.046	0.047	0.044
ACW03	U-238	KH199-1684-06	0.521	0.171	0.200	0.035
ACW03	PU-239/240	KH199-1684-06	0.191	0.118	0.124	0.047
ACW03	AM-241	KH199-1684-06	0.694	0.228	0.267	0.043

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	007.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-07	0.904	0.244	0.304	0.040
ACW03	U-235	KH199-1684-07	0.036	0.051	0.052	0.049
ACW03	U-238	KH199-1684-07	0.938	0.250	0.312	0.070
ACW03	PU-239/240	KH199-1684-07	0.235	0.125	0.134	0.042
ACW03	AM-241	KH199-1684-07	0.739	0.244	0.286	0.046

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	008.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-08	0.802	0.225	0.276	0.078
ACW03	U-235	KH199-1684-08	0.051	0.059	0.061	0.046
ACW03	U-238	KH199-1684-08	0.644	0.197	0.236	0.037
ACW03	PU-239/240	KH199-1684-08	0.154	0.105	0.109	0.046
ACW03	AM-241	KH199-1684-08	0.349	0.159	0.174	0.045

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	009.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-09	0.730	0.207	0.254	0.073
ACW03	U-235	KH199-1684-09	0.032	0.045	0.046	0.043
ACW03	U-238	KH199-1684-09	0.797	0.216	0.269	0.062
ACW03	PU-239/240	KH199-1684-09	0.136	0.092	0.096	0.041
ACW03	AM-241	KH199-1684-09	0.703	0.236	0.275	0.079

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	010.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1684	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1684-10	0.971	0.244	0.312	0.036
ACW03	U-235	KH199-1684-10	0.049	0.057	0.059	0.044
ACW03	U-238	KH199-1684-10	0.808	0.220	0.273	0.036
ACW03	PU-239/240	KH199-1684-10	0.691	0.230	0.269	0.044
ACW03	AM-241	KH199-1684-10	0.686	0.225	0.264	0.042

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	011.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1685	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1685-01	0.687	0.204	0.246	0.037
ACW03	U-235	KH199-1685-01	0.119	0.090	0.097	0.046
ACW03	U-238	KH199-1685-01	0.701	0.208	0.251	0.077
ACW03	PU-239/240	KH199-1685-01	0.214	0.125	0.132	0.098
ACW03	AM-241	KH199-1685-01	0.450	0.180	0.202	0.044

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Pu	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Am	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	012.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1685	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1685-02	0.649	0.200	0.239	0.067
ACW03	U-235	KH199-1685-02	0.069	0.069	0.072	0.047
ACW03	U-238	KH199-1685-02	0.632	0.197	0.234	0.066
ACW03	PU-239/240	KH199-1685-02	0.389	0.174	0.190	0.095
ACW03	AM-241	KH199-1685-02	0.925	0.282	0.337	0.046

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Pu	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Am	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	013.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1685	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1685-03	0.901	0.238	0.299	0.066
ACW03	U-235	KH199-1685-03	0.034	0.048	0.049	0.046
ACW03	U-238	KH199-1685-03	0.952	0.245	0.311	0.066
ACW03	PU-239/240	KH199-1685-03	0.647	0.216	0.252	0.085
ACW03	AM-241	KH199-1685-03	1.99	0.438	0.592	0.042

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Pu	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Am	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB

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Radioanalytical Results

Report Identification Number: 99A9499

Project Name:	Kaiser-Hill	Chain-of-Custody Number:	99A9499#002	Matrix:	Soil
Site Sample ID:	014.002				
Other Sample ID:	BLDG 788 PAD	Collection Date:	8/24/99	Date Received:	9/1/99
		Batch Number:	1685	Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1685-04	1.08	0.258	0.336	0.063
ACW03	U-235	KH199-1685-04	0.081	0.073	0.077	0.044
ACW03	U-238	KH199-1685-04	0.998	0.246	0.317	0.036
ACW03	PU-239/240	KH199-1685-04	0.809	0.278	0.322	0.108
ACW03	AM-241	KH199-1685-04	1.97	0.457	0.603	0.047

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Pu	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Am	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB

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Quality Control Sample
Preparation Blank (PB)

Report Identification Number: 99A9499

Project Name: Kaiser-Hill	Chain-of-Custody Number: None		Matrix: Water
Site Sample ID: N/A			
Other Sample ID: PB	Collection Date: 8/20/99	Date Received:	9/1/99
		Laboratory Code:	SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1670-PB	0.104	0.083	0.086	0.081
ACW03	U-235	SCAQC-1670-PB	-0.007	0.014	0.014	0.085
ACW03	U-238	SCAQC-1670-PB	0.037	0.051	0.052	0.069
ACW03	PU-239/240	SCAQC-1670-PB	0.000	0.000	0.000	0.046
ACW03	AM-241	SCAQC-1670-PB	0.019	0.037	0.037	0.050

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Pu	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB
Am	SCAQC-1670-LC1	SCAQC-1670-LD1	SCAQC-1670-PB

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Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number: 99A9499

Project Name: Kaiser-Hill	Chain-of-Custody Number: None	Matrix: Water	
Site Sample ID: BLANK1			
Other Sample ID: BLANK1	Collection Date: 9/1/99	Date Received: 9/1/99	
		Laboratory Code: SCA	

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1684-PB	0.089	0.079	0.081	0.076
ACW03	U-235	SCAQC-1684-PB	0.020	0.039	0.040	0.053
ACW03	U-238	SCAQC-1684-PB	-0.006	0.013	0.013	0.076
ACW03	PU-239/240	SCAQC-1684-PB	-0.008	0.017	0.017	0.100
ACW03	AM-241	SCAQC-1684-PB	0.019	0.037	0.038	0.050

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Pu	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB
Am	SCAQC-1684-LC1	SCAQC-1684-LD1	SCAQC-1684-PB

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Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number: 99A9499

Project Name: Kaiser-Hill Laboratory Code: SCA

Laboratory Contol Sample (LC1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	(CV) Decay Corrected Activity of Spike Added (dpm)	(OV) Laboratory Control Sample Activity (dpm)	Laboratory Control Sample % Recovery (Accuracy)	Number of σ Between CV and OV
ACW03	AM-241	SCAQC-1670-LC1	4.24 ∓ 0.117	3.91 ∓ 1.09	92.3	0.481
ACW03	PU-239/240	SCAQC-1670-LC1	4.55 ∓ 0.100	5.61 ∓ 1.49	123	1.14
ACW03	U-233/234	SCAQC-1670-LC1	8.02 ∓ 0.321	7.70 ∓ 1.84	96.0	0.257
ACW03	U-238	SCAQC-1670-LC1	8.02 ∓ 0.321	8.37 ∓ 1.99	104	0.255
ACW03	AM-241	SCAQC-1684-LC1	4.24 ∓ 0.117	4.54 ∓ 1.27	107	0.387
ACW03	PU-239/240	SCAQC-1684-LC1	4.55 ∓ 0.100	5.34 ∓ 1.43	117	0.879
ACW03	U-233/234	SCAQC-1684-LC1	8.02 ∓ 0.321	7.89 ∓ 1.85	98.3	0.109
ACW03	U-238	SCAQC-1684-LC1	8.02 ∓ 0.321	8.41 ∓ 1.97	105	0.288

Laboratory Duplicate Sample (LD1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	Original Sample Activity (pCi/g)	Duplicate Sample Activity (pCi/g)	Difference Between Original Activity and Duplicate Sample Activity (F)	Ratio of the Difference Between the Sample Activities and the Propagated Measurement Original Activity and Uncertainty of the Difference at 2 σ (F/E)
ACW03	U-233/234	SCAQC-1670-LD1	8.30 ∓ 2.01	8.32 ∓ 2.00	0.021	0.007
ACW03	U-235	SCAQC-1670-LD1	0.486 ∓ 0.254	0.440 ∓ 0.233	0.046	0.132
ACW03	U-238	SCAQC-1670-LD1	19.0 ∓ 4.42	19.0 ∓ 4.39	0.020	0.003
ACW03	PU-239/240	SCAQC-1670-LD1	0.125 ∓ 0.099	0.093 ∓ 0.086	0.032	0.241
ACW03	AM-241	SCAQC-1670-LD1	0.123 ∓ 0.098	0.037 ∓ 0.053	0.087	0.777
ACW03	U-233/234	SCAQC-1684-LD1	0.721 ∓ 0.252	0.595 ∓ 0.224	0.126	0.375
ACW03	U-235	SCAQC-1684-LD1	0.097 ∓ 0.085	0.033 ∓ 0.048	0.064	0.652
ACW03	U-238	SCAQC-1684-LD1	0.911 ∓ 0.296	0.590 ∓ 0.220	0.321	0.871
ACW03	PU-239/240	SCAQC-1684-LD1	0.305 ∓ 0.162	0.271 ∓ 0.151	0.034	0.152
ACW03	AM-241	SCAQC-1684-LD1	0.735 ∓ 0.282	0.941 ∓ 0.337	0.206	0.469

Thermo NUtech - Rocky Flats
RFETS, Building T886D
Golden, Colorado 80403
(303) 966-6860

GROSS A, B's

RIN: 99A9037
Report Date: 09/01/99

Sample and Duplicate Analysis Results

		Gross Alpha			Gross Beta				
Customer Sample ID	Lab Sample ID	Activity	Unc. (2s)	MDA	Activity	Unc. (2s)	MDA	Units	QC Batch
99A9037-001.001	99080003-01	8.2	2.7	3.7	19	3	3	pCi/g	99AB158
99A9037-001.001	99080003-15 D	8.1	2.5	3.2	18	3	3	pCi/g	99AB158
99A9037-002.001	99080003-02	8.9	2.6	3.7	18	2	2	pCi/g	99AB158
99A9037-003.001	99080003-03	21	4	4	19	3	3	pCi/g	99AB158
99A9037-004.001	99080003-04	10	3	4	20	3	3	pCi/g	99AB158
99A9037-005.001	99080003-05	9.0	2.5	3.5	20	2	2	pCi/g	99AB158
99A9037-006.001	99080003-06	7.6	2.4	3.4	19	2	2	pCi/g	99AB158
99A9037-007.001	99080003-07	11	3	5	25	2	1	pCi/g	99AB159
99A9037-008.001	99080003-08	9.4	3.1	4.8	23	2	2	pCi/g	99AB159
99A9037-009.001	99080003-09	10	3	5	25	2	1	pCi/g	99AB159
99A9037-010.001	99080003-10	11	3	4	22	2	1	pCi/g	99AB159
99A9037-011.001	99080003-11	12	3	4	23	2	2	pCi/g	99AB159
99A9037-011.001	99080003-18 D	12	3	5	23	2	1	pCi/g	99AB159
99A9037-012.001	99080003-12	10	3	4	24	2	2	pCi/g	99AB159

Preparation Blank Results

		Gross Alpha			Gross Beta				
QC Batch	Lab Sample ID	Activity	Unc. (2s)	MDA	Activity	Unc. (2s)	MDA	Units	
99AB158	99080003-16	0.0	0.6	1.1	0.5	1.1	1.9	pCi/g	
99AB159	99080003-19	0.0	0.3	0.5	0.1	0.6	1.0	pCi/g	

LCS Results

		Gross Alpha			Gross Beta				
QC Batch	Lab Sample ID	Activity	Unc. (2s)	MDA	Activity	Unc. (2s)	MDA	Units	SRM
99AB158	99080003-17	11.5	1.7	1.7	12.8	1.6	1.8	pCi/ml	STD_21
99AB159	99080003-20	9.9	1.6	1.6	12.1	1.5	1.6	pCi/ml	STD_21

0012

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99A9037
Data Package Narrative

Twelve priority soil samples, under the Subcontract Number KH700331EP6, were received on August 17, 1999. Twelve soil samples were analyzed by Alpha Spectroscopy for Plutonium 239/240, Uranium 233/234, 235, 238 and Americium 241.

- Analytical Method: EPI A-011 (Alpha Spec)
- Matrix Interferences: There are no matrix interferences to report.
- QC-Deficiencies: See NCR# GEL-AS-RC-1313.
- Hold Times: All samples were analyzed within the required holding time.
- RDLs: There were no failed detection limits.
- Reanalysis Information: There were no reanalysis of the samples.
- Deviations from SOP: There were no method deviations.

Comments:

1. The following samples did not meet the requirement in the SOW, Section 11.2.1 page E-10. The FWHM resolution for the tracer peak was not $\leq$ 80 keV for:

99A9037-001.002_UU	82 keV
99A9037-005.002_UU	83 keV

2. RC01CAL_EPI_2-SEP-1999 and RC01CAL_EPI_3-SEP-1999 correspond to RC01CAL_EPI_01SEP1999.

3. NCR# GEL-AS-RC-1313:

   QC643068_UU (Blank) had a tracer yield greater than 110%.

4. NCR# GEL-AS-RC-1314:

   99A9037-008.002_AM had a tracer yield greater than 110%.

Rocky Flats

Sample QC Results Summary
9/13/99

Batch # : 157100
RIN 99A9037
Line Item Code: RC01B003
Matrix: Soil

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL pCi/g	Tracer Yield %
99A9037-001.002	9908548-01	Americium-241	1.14E-01	1.12E-01	7.74E-02	0.30	101.50
		Plutonium-239/240	7.01E-02	1.21E-01	2.50E-01	0.30	79.46
		Uranium-233/234	9.82E-01	3.21E-01	1.60E-01	1.00	96.67
		Uranium-235	1.08E-03	5.85E-02	1.96E-01	1.00	96.67
		Uranium-238	1.73E+00	4.25E-01	1.79E-01	1.00	96.67
99A9037-002.002	9908548-02	Americium-241	2.88E-02	5.63E-02	7.79E-02	0.30	94.07
		Plutonium-239/240	1.41E-02	5.60E-02	1.61E-01	0.30	98.92
		Uranium-233/234	6.62E-01	2.74E-01	1.90E-01	1.00	95.29
		Uranium-235	2.17E-02	5.73E-02	1.42E-01	1.00	95.29
		Uranium-238	7.91E-01	3.02E-01	2.22E-01	1.00	95.29
99A9037-003.002	9908548-03	Americium-241	1.56E+01	1.31E+00	1.43E-01	0.30	97.30
		Plutonium-239/240	4.15E+00	6.68E-01	1.39E-01	0.30	101.38
		Uranium-233/234	1.33E+00	3.90E-01	2.11E-01	1.00	97.78
		Uranium-235	2.21E-02	5.84E-02	1.45E-01	1.00	97.78
		Uranium-238	1.39E+00	3.93E-01	7.85E-02	1.00	97.78
99A9037-004.002	9908548-04	Americium-241	2.89E+00	6.22E-01	2.05E-01	0.30	103.00
		Plutonium-239/240	8.84E-01	3.74E-01	2.64E-01	0.30	87.71
		Uranium-233/234	1.02E+00	3.65E-01	2.38E-01	1.00	89.44
		Uranium-235	9.20E-03	6.95E-02	2.18E-01	1.00	89.44
		Uranium-238	1.93E+00	4.98E-01	2.38E-01	1.00	89.44
99A9037-005.002	9908548-05	Americium-241	5.68E-02	7.87E-02	7.69E-02	0.30	104.04
		Plutonium-239/240	2.43E-02	6.45E-02	1.60E-01	0.30	88.45
		Uranium-233/234	6.62E-01	2.91E-01	2.75E-01	1.00	92.61
		Uranium-235	8.42E-03	6.36E-02	2.00E-01	1.00	92.61
		Uranium-238	1.27E+00	3.86E-01	1.78E-01	1.00	92.61

99A9037-006.002	9908548-06	Americium-241	1.35E-01	1.25E-01	1.42E-01	0.30	105.58
		Plutonium-239/240	6.11E-02	8.46E-02	8.28E-02	0.30	94.27
		Uranium-233/234	5.07E-01	2.53E-01	2.36E-01	1.00	104.13
		Uranium-235	8.48E-03	6.41E-02	2.01E-01	1.00	104.13
		Uranium-238	8.45E-01	3.13E-01	8.18E-02	1.00	104.13
99A9037-007.002	9908548-07	Americium-241	1.57E-01	1.31E-01	1.36E-01	0.30	100.14
		Plutonium-239/240	9.48E-02	1.07E-01	1.60E-01	0.30	97.01
		Uranium-233/234	6.01E-01	2.61E-01	1.45E-01	1.00	102.83
		Uranium-235	4.42E-02	8.26E-02	1.72E-01	1.00	102.83
		Uranium-238	8.62E-01	3.11E-01	1.45E-01	1.00	102.83
QC643068	Blank	Americium-241	2.29E-02	6.06E-02	1.50E-01	0.30	89.95
		Plutonium-239/240	-1.18E-02	1.63E-02	1.46E-01	0.30	101.48
		Uranium-233/234	1.91E-02	5.06E-02	1.25E-01	1.00	110.87
		Uranium-235	-1.21E-02	1.67E-02	1.49E-01	1.00	110.87
		Uranium-238	6.93E-02	8.60E-02	1.25E-01	1.00	110.87
QC643069	Duplicate 99A9037-005.002	Americium-241	7.85E-02	9.75E-02	1.42E-01	0.30	89.50
		Plutonium-239/240	1.07E-01	1.13E-01	1.42E-01	0.30	84.73
		Uranium-233/234	8.81E-01	2.80E-01	1.36E-01	1.00	105.83
		Uranium-235	1.19E-02	4.73E-02	1.36E-01	1.00	105.83
		Uranium-238	1.02E+00	3.01E-01	1.14E-01	1.00	105.83
QC6403070	LCS	Americium-241	8.66E+00	9.49E-01	7.35E-02	0.30	97.52
		Plutonium-239/240	8.08E+00	9.10E-01	1.58E-01	0.30	94.19
		Uranium-233/234	9.05E+00	8.94E-01	1.53E-01	1.00	103.46
		Uranium-235	3.06E-01	1.69E-01	1.53E-01	1.00	103.46
		Uranium-238	8.18E+00	8.50E-01	1.36E-01	1.00	103.46

LCS recovery:

	Nom. Conc.	Recovery:
Am-241	8.81	98%
Pu-239/240	8.61	94%
U-238	8.7	94%

Rocky Flats

Sample QC Results Summary
9/13/99

Equivalency:

Am-241	F/E = 0.173
Pu-239/240	F/E = 0.636
U-233/234	F/E = 0.542
U-235	F/E = 0.044
U-235	F/E = 0.511

Rocky Flats

Sample QC Results Summary
9/13/99

Batch # : 157101
RIN 99A9037
Line Item Code: RC01B003
Matrix: Soil

KHCO ID #	GEL ID #	Analysis	Result pCi/g	2sigma Error pCi/g	MDA pCi/g	RDL pCi/g	Tracer Yield %
99A9037-008.002	9908548-08	Americium-241	1.11E-01	1.20E-01	2.02E-01	0.30	115.03
		Plutonium-239/240	2.86E-02	7.59E-02	1.88E-01	0.30	86.88
		Uranium-233/234	6.05E-01	2.66E-01	2.33E-01	1.00	95.51
		Uranium-235	4.28E-02	8.00E-02	1.67E-01	1.00	95.51
		Uranium-238	8.57E-01	3.07E-01	1.67E-01	1.00	95.51
99A9037-009.002	9908548-09	Americium-241	7.24E-02	9.93E-02	1.71E-01	0.30	105.77
		Plutonium-239/240	7.66E-02	1.06E-01	1.04E-01	0.30	87.99
		Uranium-233/234	1.06E+00	3.50E-01	2.98E-01	1.00	104.80
		Uranium-235	8.97E-02	1.09E-01	1.82E-01	1.00	104.80
		Uranium-238	1.27E+00	3.67E-01	1.62E-01	1.00	104.80
99A9037-010.002	9908548-10	Americium-241	5.36E-02	1.06E-01	2.33E-01	0.30	96.59
		Plutonium-239/240	6.32E-02	1.19E-01	2.47E-01	0.30	85.17
		Uranium-233/234	3.60E-01	1.92E-01	1.31E-01	1.00	106.88
		Uranium-235	1.36E-02	5.41E-02	1.55E-01	1.00	106.88
		Uranium-238	9.29E-01	3.08E-01	1.55E-01	1.00	106.88
99A9037-011.002	9908548-11	Americium-241	4.48E-01	2.31E-01	1.95E-01	0.30	91.41
		Plutonium-239/240	8.95E-02	1.23E-01	2.11E-01	0.30	97.93
		Uranium-233/234	6.74E-01	2.82E-01	2.37E-01	1.00	96.03
		Uranium-235	3.67E-02	8.26E-02	1.91E-01	1.00	96.03
		Uranium-238	8.80E-01	3.12E-01	1.43E-01	1.00	96.03
99A9037-012.002	9908548-12	Americium-241	7.27E-02	8.23E-02	6.57E-02	0.30	104.35
		Plutonium-239/240	-6.91E-03	1.35E-02	1.44E-01	0.30	102.40
		Uranium-233/234	6.54E-01	2.47E-01	1.70E-01	1.00	98.66
		Uranium-235	9.35E-04	5.07E-02	1.70E-01	1.00	98.66
		Uranium-238	9.27E-01	2.89E-01	1.16E-01	1.00	98.66

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Rocky Flats

Sample QC Results Summary
9/13/99

QC643071	Blank	Americium-241	9.55E-02	1.06E-01	1.72E-01	0.30	99.22
		Plutonium-239/240	-1.37E-02	1.90E-02	1.69E-01	0.30	96.76
		Uranium-233/234	-1.14E-01	6.44E-02	4.20E-01	1.00	62.17
		Uranium-235	-1.90E-02	2.63E-02	2.35E-01	1.00	62.17
		Uranium-238	0.00E+00	0.00E+00	1.07E-01	1.00	62.17
QC643072	Duplicate 99A9037-011.002	Americium-241	6.01E-01	3.10E-01	2.03E-01	0.30	85.82
		Plutonium-239/240	7.53E-02	1.41E-01	2.94E-01	0.30	64.19
		Uranium-233/234	9.06E-01	3.28E-01	2.72E-01	1.00	98.55
		Uranium-235	3.65E-02	8.22E-02	1.90E-01	1.00	98.55
		Uranium-238	1.02E+00	3.35E-01	1.42E-01	1.00	98.55
QC6403073	LCS	Americium-241	9.88E+00	1.30E+00	1.20E-01	0.30	65.64
		Plutonium-239/240	9.73E+00	1.05E+00	1.75E-01	0.30	91.63
		Uranium-233/234	9.36E+00	1.29E+00	3.35E-01	1.00	56.27
		Uranium-235	2.66E-01	2.22E-01	2.30E-01	1.00	56.27
		Uranium-238	1.06E+01	1.37E+00	2.30E-01	1.00	56.27

LCS recovery:

	Nom. Conc.	Recovery:
Am-241	9.51	104%
Pu-239/240	9.29	104%
U-238	9.39	113%

Equivalency:

Am-241	F/E = 0.396
Pu-239/240	F/E = 0.076
U-233/234	F/E = 0.536
U-235	F/E = 0.002
U-235	F/E = 0.306

ATTACHMENT 12B

SOIL SAMPLE
RADIOANALYTICAL RESULTS

R6

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-02-RI

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Roof (ceiling) - Interior

Location: Building 788

Survey Plan

Collect measurements from accessible surfaces as specified in the table below:

Removable and direct surveys are performed by RCTs.

Sampling is the responsibility of the customer.

If sampling is specified, the removable survey does not need to be in the same location as the sample.

Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT.	40 (minimum) total α direct measurements at locations selected by an RCT.	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 (minimum) removable β/γ swipes at locations selected by an RCT.	40 (minimum) total β/γ direct measurements at locations selected by an RCT.	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or applicable instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign M. Rodriguez date 12-10-98

Reviewed by: print John M. Ilcr sign [signature] date 12-14-98

Approved by: print ES TABROOKS sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-02-RI

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	8.4	9.0	6.6	10.0
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	175.7	176.0	32.6	183.2

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	76.7	58.0	77.6	94.7
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1284.4	1321.5	248.4	1342.1

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I XX SCO II ____ Subdivide and resample ____

Comments:

Characterization Survey Unit not used for SCO purposes. Data used for LSA waste Determination instead.

M. Rodriguez

Prepared by Rad Eng print Michalene Rodriguez sign [signature] date 1/4/99

Reviewed by Rad Eng print John M. Miller sign [signature] date 1-5-99

Approved by print E. Stansbooks sign [signature] date 1/6/99

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-03-CCR

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Contamination Control Room - to include vent exhaust (referenced in past as Permacon)
Location: Inside Building 788

Survey Plan

Collect measurements from accessible surfaces as specified in the table below.
Removable and direct surveys are performed by RCTs.
Sampling is the responsibility of the customer.
If sampling is specified, the removable survey does not need to be in the same location as the sample. Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

Note: RWP Required For Entry

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or applicable instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts, and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez, Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print John Miller sign [signature] date 12-14-98

Approved by: print ESTABROOKS sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-03-CCR

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	8.1	3.0	19.1	13.3
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	158.0	156.0	26.0	165.0

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	99.7	57.0	110.5	129.1
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1122.6	1092.0	225.3	1182.6

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I __XX__ SCO II _____ Subdivide and resample _____

Comments:

Characterization Survey Unit not used for SCO purposes. Data used for LSA waste Determination instead.

M. Rodriguez

Prepared by Rad Eng print Michalene Rodriguez sign M. Rodriguez date 1/4/99

Reviewed by Rad Eng print John Miller sign [signature] date 1-5-99

Approved by print E STABROOKS sign [signature] date 1/6/99

RADIOLOGICAL CHARACTERIZATION FOR SCO (REV 1)

Characterization Survey Unit ID SCO-308A-01-WE

Description of Characterization Survey Unit Isotopic information

WG Pu ☐	Enriched U ☐	Depleted U ☐	Natural U ☐	Other ☒ (see comment section)

Contents of Characterization Survey Unit:
North, South, West, and East Exterior Walls of Building 308A aka Pump House
Location: North side between A & B ponds

Survey Plan
Collect measurements from accessible surfaces as specified in the table below.
Removable and direct surveys are performed by RCTs.
Sampling is the responsibility of the customer.
If sampling is specified, the removable survey does not need to be in the same location as the sample.
Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~_____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or appropriate instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts, and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print John Miller sign [signature] date 12-14-98

Approved by: print E S Mathews sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RSFORM-09.05-01

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-308A-01-WE

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	1.4	0.0	2.3	19.50
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	206.1	208.0	17.5	2108.0

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	698.0	558.0	367.3	795.8
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1609.2	1545.0	191.8	1660.3

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I __XX__ SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 7.6% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Americium and Plutonium activities have been quantitatively described by the Alpha component.

Prepared by Rad Eng print Michalene Rodriguez sign _____ date 7/1/99

Reviewed by Rad Eng print P.A. Nikkels sign _____ date 7/1/99

Approved by print W.J. Bair sign _____ date 7/7/99

Logbook Control Number SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-EQU-01-PMCM

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Pug Mill and Cement Mixer

Location: Pug Mill – South of the Clarifier Tank,
Cement Mixer - between Building 788 (west) and Solar Pond 207C

Survey Plan

See attached Technical Basis Document 00119.

Sampling is the responsibility of the customer.

If sampling is specified, the removable survey does not need to be in the same location as the sample.

Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	~~40 (minimum) removable α swipes at locations selected by an RCT~~	~~40 (minimum) total α direct measurements at locations selected by an RCT~~	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	~~30 removable β swipes at locations selected by RCT~~	~~____ total β direct measurements at locations selected by RCT~~	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Radiological Work Permit required before entry.
- ~~Obtain direct alpha measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100.~~
- ~~Neglect background when calculating alpha activity.~~
- ~~RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.~~
- ~~Record actual instrument readings for direct counts, and smears.~~
- ~~Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.~~
- ~~Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.~~

Prepared by: print Michalene Rodriguez Radiological Engineer sign M. Rodriguez date 1/6/99

Reviewed by: print John Miller sign [signature] date 1-6-99

Approved by: print E STAVBROOKS sign [signature] date 1/6/99

Each section of this form may be enlarged, or continuation pages added, as required. Logbook Control Number SCO-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-EQU-01-PMCM

Summary of Data

Removable Contamination Dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	See Note[1]	N/A	N/A	N/A
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	See Note[1]	N/A	N/A	N/A

Total Contamination Dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	212,500[2]	N/A	N/A	212,500
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	27,800[2]	N/A	N/A	27,800

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I __XX__ SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.
Only alpha removable and total contamination was used in determining SCO categorization.
Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

[1] Areas are inaccessible.

[2] Total (fixed and removable) measurements were not obtained due to inaccessible areas and hazards associated with entry into the Pug Mill and Cement Mixer i.e., confined space entry. An estimate of the total contamination present will be based on Technical Basis Document-00119 (See Attachment).

Prepared by Rad Eng print Michalene Rodriguez sign M. Rodriguez date 6/3/99
Reviewed by Rad Eng print P.A. DUKART sign P.A. Dukart date 6/4/99
Approved by print GARY GUINN sign Gary D. Guinn date 6/8/99

Logbook Control Number SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-207-02-CW

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Catwalk

Location: Top and side of Clarifier Tank 207A

Survey Plan

Collect measurements from accessible surfaces as specified in the table below.

Removable and direct surveys are performed by RCTs.

Sampling is the responsibility of the customer.

If sampling is specified, the removable survey does not need to be in the same location as the sample. Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

Note: RWP Required For Entry

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or appropriate instrumentation.
- Neglect background when calculating alpha and beta activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts, and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print John Miller sign [signature] date 12-14-98

Approved by: print Es Maybrooks sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-207-02-CW

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	2.3	1.5	3.2	31.6
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	153.5	148.0	22.8	1595.2

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	147.2	75.0	159.7	189.7
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1192.6	1177.5	215.4	1250.0

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I __XX__ SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Only alpha removable and total contamination was used in determining SCO categorization.

Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

Prepared by Rad Eng print Michalene Rodriguez sign [signature] date 6/3/99

Reviewed by Rad Eng print P.A. OUKART sign [signature] date 6/4/99

Approved by print GARY GUNN sign [signature] date 6/7/99

Logbook Control Number SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-207-01-CI

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Interior of Clarifier Tank

Location: Located between Building 788 and 207A Solar Pond

Survey Plan

Collect measurements from accessible surfaces as specified in the table below.

Removable and direct surveys are performed by RCTs.

Sampling is the responsibility of the customer.

If sampling is specified, the removable survey does not need to be in the same location as the sample. Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

Note: RWP Required For Entry

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts, and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print John Miller sign [signature] date 12-14-98

Approved by: print ES Mabrooks sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RSFORM-09.05-01

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-207-01-CI

Summary of Data

Removable Contamination Dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	150.7	117.0	142.5	1802.40
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	191.8	200.0	22.7	1965.30

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	212,500[1]	N/A	N/A	N/A
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	27,800[1]	N/A	N/A	N/A

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I XX SCO II _____ Subdivide and resample _____

Comments:

Removable survey points 1-12 were taken on 12/31/98. Not all areas of the clarifier tank floor were accessible due to the accumulation of water, ice, and snow over the past several weeks. Removable survey points 13-65 were taken from 8/19/98-9/16/98. These surveys were conducted during the removal of sludge material from the clarifier tank. Since the removal of all sludge material, the clarifier tank has been power-washed several times thus the removable activity revealed from survey points 13-65 may be conservative in nature.

Total (fixed and removable) measurements were not obtained due to the hazards associated with entry into the clarifier tank, i.e., confined space entry, ice and snow accumulation. An estimate of the total contamination present will be based on Technical Basis Document-00119[1] (See Attachment).

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-207-01-CI

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.
Americium and Plutonium activities have been quantitatively described by the Alpha component.

Prepared by Rad Eng print Michalene Rodriguez sign _____ date 7/1/99

Reviewed by Rad Eng print PA Duran sign _____ date 7/1/99

Approved by print WJ BAIR sign _____ date 7/7/99

Logbook Control Number SCO-CHAR-98-418

RSFORM-09.05-01

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-07-RE

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:
Exterior Roof
Location: Building 788

Survey Plan
Collect measurements from accessible surfaces as specified in the table below.
Removable and direct surveys are performed by RCTs.
Sampling is the responsibility of the customer.
If sampling is specified, the removable survey does not need to be in the same location as the sample.
Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or appropriate instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print [signature] sign [signature] date 12-14-98

Approved by: print ESTHER COOKS sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RSFORM-09.05-01

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-07-RE

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	6.6	3.0	7.2	78.0
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	170.2	168.0	27.7	1749.0

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	121.2	90.0	107.6	139.5
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1368.6	1332.0	248.8	1411.0

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I XX SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Only alpha removable and total contamination was used in determining SCO categorization.

Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

Prepared by Rad Eng print Michelene Rodriguez sign M. Rodriguez date 6/2/99

Reviewed by Rad Eng print Patrick Durant sign P. Durant date 6/8/99

Approved by print GARY GUINN sign Gary D. Guinn date 6/7/99

6/8/99 TELECON APPROVAL

Logbook Control Number SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-06-WE

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:
Exterior North, South, East, and West walls of Building 788
Location: Exterior of Building 788

Survey Plan
Collect measurements from accessible surfaces as specified in the table below.
Removable and direct surveys are performed by RCTs.
Sampling is the responsibility of the customer.
If sampling is specified, the removable survey does not need to be in the same location as the sample.
Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~_____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or appropriate instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts, and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign Michalene Rodriguez date 12-10-98

Reviewed by: print John M. Miller sign [signature] date 12-14-98

Approved by: print E S TAYBROOKS sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-06-WE

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	8.4	20.0	9.2	95.4
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	171.4	200	30.4	1753.8

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	78.1	93.0	22.0	81.0
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1174.3	1114.5	226.0	1203.6

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I __XX__ SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Only alpha removable and total contamination was used in determining SCO categorization.

Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

Prepared by Rad Eng print Michalene Rodriguez sign M. Rodriguez date 6/2/99

Reviewed by Rad Eng print P.A. Dunbar sign P.A. Dunbar date 6/4/99

Approved by print R.M. RICHARDS sign R.M. Richards date 6/7/99

Logbook Control Number SCO-CHAR-98-418

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RSFORM-09.05-01

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-01-WI

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Interior North, South, East, and West walls of Building 788 (to include structural uprights)
(This does not include the Contamination Control Room)

Survey Plan

Collect measurements from accessible surfaces as specified in the table below.
Removable and direct surveys are performed by RCTs.
Sampling is the responsibility of the customer.
If sampling is specified, the removable survey does not need to be in the same location as the sample.
Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	40 (minimum) removable α swipes at locations selected by an RCT	40 (minimum) total α direct measurements at locations selected by an RCT	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	40 removable β swipes at locations selected by RCT	40 total β direct measurements at locations selected by RCT	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
  - Record actual instrument readings for direct counts and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 12-10-98

Reviewed by: print John Miller sign [signature] date 12-14-98

Approved by: print ESTABROOK sign [signature] date 12/14/98

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

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RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-788-01-WI

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	5.0	3.0	4.5	55.5
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	162.0	160.0	25.6	1650.2

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Alpha contamination	70.0	66.0	37.7	74.7
Plutonium contamination				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1154.9	1174.5	214.3	1181.1

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I XX SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and < 1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Only alpha removable and total contamination was used in determining SCO categorization.

Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

Prepared by Rad Eng print Michalene Rodriguez sign M. Rodriguez date 6/2/99

Reviewed by Rad Eng print CA. Mikat sign _____ date 6/4/99

Approved by print R.M. RICHARDS sign _____ date 6/7/99

Logbook Control Number SCO-CHAR-98-418

199

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-SPD-01

Description of Characterization Survey Unit Isotopic information

WG Pu ☐ Enriched U ☐ Depleted U ☐ Natural U ☐ Other ☒ (see comment section)

Contents of Characterization Survey Unit:

Solar Pond Debris

Location: Solar Ponds 207A, 207B (North, Center, and South) and 207C (outside and inside of posted Contaminated Areas – majority of items being within the posted CA)

Survey Plan

Collect measurements from accessible surfaces of metal, plastic, and hard rubber items as specified in the table below:

Removable and direct surveys are performed by RCTs.

Sampling is the responsibility of the customer.

If sampling is specified, the removable survey does not need to be in the same location as the sample.

Return the results of all measurements to Radiological Engineering, T891C, for evaluation.

	Swipes for Removable Contamination	Direct Measurements Made with a Survey Meter	Samples Collected from Surfaces and Analyzed by a Lab
Alpha Measurements	15 (minimum) removable α swipes for metal, plastic, and rubber (each) objects at each pond location. The item to be surveyed will be selected by an RCT.	15 (minimum) total α direct measurements for metal, plastic, and rubber (each) objects at each pond location. The item to be surveyed will be selected by an RCT.	~~____ samples collected by customer at locations described below, analyzed for gross α~~
Beta/Gamma Measurements	15 (minimum) removable β/γ swipes for metal, plastic, and rubber (each) objects at each pond location. The item to be surveyed will be selected by an RCT.	15 (minimum) total β/γ direct measurements for metal, plastic, and rubber (each) objects at each pond location. The item to be surveyed will be selected by an RCT.	~~____ samples collected by customer at locations described below, analyzed for gross β~~

Note. The sum of direct measurements and samples should be ≥ 30. A typical survey plan calls for 30 direct measurements and zero samples. If high levels of contamination are expected below non-factory original coatings, the number of samples would increase.

Survey Plan Comments and Special Instructions

- Radionuclides of concern are Americium-241 and Plutonium-239. Isotopic mixture is approximately 76% Am-241 and 23% Pu-239/240.
- Obtain direct alpha and beta/gamma measurements by performing 1 minute PAT using the NE Electra with DP6 Probe or Bicron A-100 or applicable instrumentation.
- Neglect background when calculating alpha and beta/gamma activity.
- RCT shall annotate each survey conducted on each page (front and continuation sheets) with a unique Survey Number acquired by the RCT from a Survey Log located in B788.
- Record actual instrument readings for direct counts and smears.
- Document results on "788 Cluster Radiological Contamination Survey Form." This form is equivalent to RSFORMS-07.02-01.
- Attach copy of completed survey(s) to this Characterization Form, RSFORM-09.05-01, and forward to Radiological Engineering, T891-C.

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-SPD-01

Prepared by: print Michalene Rodriguez Radiological Engineer sign [signature] date 1/5/99

Reviewed by: print John J. Miller sign [signature] date 1/5/99

Approved by: print ESTABROOKS sign [signature] date 1/5/99

Each section of this form may be enlarged, or continuation pages added, as required. SCO-CHAR-98-418

RADIOLOGICAL CHARACTERIZATION FOR SCO

Characterization Survey Unit ID SCO-SPD-01

Summary of Data

Removable Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Total Alpha Contamination	44.6	30.0	104.5	58.2
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma	1379.2	1392.0	254.5	1412.4

Total Contamination dpm/100 cm2	Mean	Median	Standard Deviation	UCL95
Total Alpha Contamination	148.4	94.0	293.9	186.7
Plutonium				
Enriched uranium				
Natural or depleted uranium				
Beta/gamma contamination	1894.7	1767.0	908.3	2013.1

Attach copies of survey forms and sampling data.

Analysis of Results

SCO I XX SCO II _____ Subdivide and resample _____

Comments:

Isotopic Mixture is 76% Americium-241, 23% Plutonium-239/240, and <1% other.

Removable Contamination was multiplied by 10% (swipe efficiency) See TBD-00126.

Only alpha removable and total contamination was used in determining SCO categorization.

Beta/gamma component not considered due to Am-241 and Pu-239 are the main radionuclides of concern and are strictly alpha emitters (gamma emission from Am-241 already accounted for from the alpha emission).

Prepared by Rad Eng print Michalene Rodriguez sign M. Rodriguez date 4/29/99

Reviewed by Rad Eng print R. MARK RICHARDS sign [signature] date 4/29/99

Approved by print ESTABROOKS sign [signature] date 4/29/99

Logbook Control Number SCO-CHAR-98-418

202

The Estimation of Total Surface Contamination Levels Utilizing Analytical Data Obtained From Analysis of Clarifier Sludge Material.

January 5, 1999
Technical Basis Document-00119

Written By: Michalene Rodriguez Signature Date
Radiological Engineer

Reviewed By: John J. Miller Signature Date
Radiological Engineer

Approved By: H. Bates Estabrooks Signature Date
Radiological Engineering Manager

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Purpose

The purpose of this document is to provide a technical basis for the methodology in applying analytical data obtained from the clarifier sludge material as an estimation of total surface contamination. This method will be applicable to various items with unsurveyable or inaccessible areas located in the vicinity of Building 788 and the Solar Evaporation Ponds (SEP).

Background

The Solar Evaporation Ponds, also known as the "high nitrate ponds," were used primarily for the disposal of low-level radioactive wastes contaminated with high concentrations of nitrate and for difficult to treat wastes. Solar pond clean-up activities began in the mid-1980's and was a response action to the presence of waste materials in the solar ponds and the presence of contamination in nearby soils, groundwater, and surface water. In 1985, Building 788, Trailer 788A, the 207A Clarifier Tank, and various ancillary equipment (Pug Mill, cement mixer) were constructed as part of the treatment process to convert pond sludge into pondcrete, which is a mixture of SEP sludge and Portland cement.

In 1989, the last of the process waste sludge was removed from Pond 207A and pumped into the open top clarifier tank. Clarifier operations were halted shortly thereafter leaving approximately 16,500 gallons of waste sludge and water in the 30,000 gallon capacity clarifier tank.

In 1992 and 1995 two laboratory analyses were conducted to determine and estimate the radionuclides and associated activities in the waste sludge. The first study in 1992, was from Brown and Root, Inc. The analysis revealed approximately 3400-6600 pCi/g gross alpha and 540-860 pCi/g gross beta activity in the sludge waste (Attachment I). The second study performed in 1995, from Halliburton NUS Corporation, estimated the sludge contained 13,000 pCi/g of Americium-241, 3,900 pCi/g of Plutonium-239/240 and 89 pCi/g of Plutonium-238 (Attachment II).

A letter dated January 7, 1998 to S.M. Nesta from C.A. Patnoe, K-H Air Quality Management, states the "Brown and Root analysis is the most accurate and representative analysis of the sludge and water contained in the tank." (Attachment III).

In 1998, the remaining sludge held in the Clarifier Tank was successfully removed. The mission today is the Decontamination and Decommissioning (D&D) of the Building 788 Cluster by June 30, 1999. This action will satisfy one of the requirements of Order on Consent 97-08-21-01 that has been agreed to by Kaiser-Hill. The general cleanup, removal and packaging of waste and equipment from the SEPs will supplement this action.

Technical Discussion

The waste generated from the D&D of the Building 788 Cluster will be disposed of as low-level waste, low-level mixed waste, or free released. The majority of the waste will be sent as low-level waste to a recycle metal melt facility and will be shipped, per Department of Transportation, as Surface Contaminated Objects (SCO). The low-level mixed waste will be sent to Envirocare or NTS and will be shipped as Low Specific Activity Waste. Few items from the D&D process will be free released. Items such as desks, chairs, lockers, and cabinets, located inside Building 788 and T788A will be free released upon survey results.

To demonstrate compliance with Radiological Safety Practice PRO-267-RSP-09.05, *Radiological Characterization For Surface Contaminated Objects*, DOT shipping regulations, and disposal site waste acceptance criteria, characterization surveys were conducted. The surveys were performed on the interior and exterior walls, roof top, and ceiling of Building 788, Contamination Control Room (located inside Building 788), interior surface of the clarifier tank (removable only), catwalk, and exterior walls of the 308A Pump House.

Certain items and materials such as the Pug Mill, Cement Mixer, Clarifier Tank (total) and wooden surfaces were not surveyed due to the items being inaccessible, posing a hazard, or composed of unsurveyable material. The intention to characterize these items is to apply the analytical data, taken from the sludge waste, from Brown and Root, Inc., as an estimate of total surface contamination for these items. The methodology imposed is shown below:

Alpha Parameters:

Description	Amount
Activity	6600 pCi/g
Density of Sludge (from Halliburton NUS Report)	1.45 g/cm^3
Thickness of Residual Sludge Remaining on Surfaces (assumed)	0.1 cm
Conversion Factor	1 Ci = $2.22E10^{12}$ dpm

Activity ($dpm/100\ cm^2$) = [6600 pCi/g] [1.45 g/cm^3] [0.1 cm] =

[$9.57E10^{-10}$ Ci/cm^2] [$2.22E10^{12}$ dpm] [100 cm^2] ~ **212,500 dpm/100 cm^2**

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Beta Parameters:

Description	Amount
Activity	860 pCi/g
Density of Sludge (from Halliburton NUS Report)	1.45 g/cm^3
Thickness of Residual Sludge Remaining on Surfaces (assumed)	0.1 cm
Conversion Factor	1 Ci = $2.22E10^{12}$ dpm

Activity (dpm/100 cm^2) = [860 pCi/g] [1.45 g/cm^3] [0.1 cm] =

[$1.25E10^{-10}$ Ci/cm^2] [$2.22E10^{12}$ dpm] [100 cm^2] ~ **27,800 dpm/100 cm^2**

Conclusions

The upper SCO I limit as specified in Table I of RSP-09.05 is **1,000,000 dpm/cm^2** for fixed Plutonium/Americium on inaccessible areas. Based on this information, items coming from the SEP area with inaccessible areas, i.e., Pug Mill, cement mixer, meet the definition of SCO I and will be assigned the above calculated activities.

References

PRO-267-RSP-09.05, Rev. 1, *Radiological Characterization for Surface Contaminated Objects*, November, 98.

Historical Release Report For The Rocky Flats Plant, Volume I, June, 1992.

Safety Analysis For Clarifier To RCRA Stable Project, Nuclear Safety Technical Report, Revision 0, NSTR-017-97, Rocky Mountain Remediation Services, LLC, December, 1997.

Integrated Safety Management Plan For The Clarifier To RCRA Closure Project, Revision 0, RF/RMRS-98-213UN, Rocky Mountain Remediation Services, LLC, May, 1998.

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ATTACHMENT 1 TBD 00119

Brown & Root, Inc.	CONTRACT NO. JR-1198
STANDARD PROCESS DATA SHEETS	IDENTIFICATION NO. 000-020-00-001
APPROVAL DATE 06/04/92	PAGE 46 OF 97

SLUDGE

ANALYSIS	UNITS	RANGE	MEAN [a] CONCENTRATION
Cyanide-Amenable	mg/kg	NA	NA
Cyanide-Total	mg/kg	21-190	87
Gross Alpha	pCi/g	3400-6600	5250
Gross Beta	pCi/g	540-860	695
Moisture-Gravimetric	%	33.1-72.5	60.6[d]
Moisture-Karl Fisher	%	NA	NA
pH	units	9.7-9.8	9.75
Specific Gravity	-	NA	NA
Swell Test	%	10	10
TOC (Total Organic Carbon)	mg/kg	3500-6400	5175
Chloride [b]	mg/l	160-180	168
Nitrate [b]	mg/l	410-450	430
% Recovery of Solids [b]	%	18.0-22.2	21
Phosphorus, Total (as P) [b]	mg/l	33-52	46
Sulfate [b]	mg/l	210-280	243
TDS (Total Dissolved Solids) [b]	mg/l	4600-5400	4950
Total Solids	%	27.5-66.9	39.4
Inorganics			
Arsenic	mg/kg	13.5-21.9	12
Barium	mg/kg	94.8-217	183
Boron	mg/kg	420-1380	930
Cadmium	mg/kg	2010-4660	3660
Chromium	mg/kg	1180-3190	2480
Lead	mg/kg	83-191	161
Magnesium	mg/kg	10,400-24,200	20,500
Mercury	mg/kg	5-14	9
Nickel	mg/kg	339-902	700
Potassium	mg/kg	28,700-67,900	56,500
Selenium	mg/kg	ND	ND
Silver	mg/kg	64.6-166	134.9
Sodium	mg/kg	39,200-96,300	78,900

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

May 05, 1995
Report No.: 00025501
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: ROCKY FLATS - C/O NUS CORPORATION
ADDRESS: 661 ANDERSEN DRIVE
PITTSBURGH, PA 15220-
ATTENTION: MR. RICH NINESTEEL

NUS CLIENT NO: 1431 0007
WORK ORDER NO: 3A23
VENDOR NO:

SAMPLE ID: CLARIFIER AS REC'D
NUS SAMPLE NO: P0297299
P.O. NO.:

DATE SAMPLED: UnAvail
DATE RECEIVED: 03-JAN-95
APPROVED BY: Lynch, Pat

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	R110AS	Isotopic Americium and Curium		
		Americium-241 (Am-241)	13 +/-2	nCi/g
2	R200S	Gamma Spectroscopy		
		Cesium-134	< 4	pCi/g
		Cesium-137	< 6	pCi/g
3	R110PS	Isotopic Plutonium		
		Plutonium-238 (Pu-238)	89 +/- 37	pCi/g
		Plutonium-239/240 (Pu-239/240)	3900+/-400	pCi/g
4	R05S	Radium-226 (Ra-226)	6.2 +/- 0.7	pCi/g
5	R110US	Isotopic Uranium		
		Uranium-233/234 (U-233/234)	28 +/- 3	pCi/g
		Uranium-235 (U-235)	1.1 +/- 0.2	pCi/g
		Uranium-238 (U-238)	32 +/- 4	pCi/g
6	R11S	Strontium-89 and -90		
		Strontium-89 (Sr-89)	0.53+/-0.06	pCi/g
		Strontium-90 (Sr-90)	0.88+/-0.27	pCi/g
7	ABES	Beryllium, Total (Be)	320	mg/kg
8	ACDS	Cadmium, Total (Cd)	2100	mg/kg
9	S088	Bulk Density on Waste	1.45	g/cc
10	I630	Percent Moisture	61.9	%
11	I490S	Non-aqueous sample pH in Water	9.8	
19	DPACK	CLP Data Package Deliverable	DONE	

COMMENTS:
2 Density of original sample 1/10 of the density of standard.
Density adjusted to 98% of standard. (All Nuclides affected.)

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KAISER · HILL
COMPANY

INTEROFFICE MEMORANDUM

DATE: January 7, 1998

TO: S. M. Nesta, National Environmental Policy Act, Bldg. T130C, X6386

FROM: C. A. Patnoe, K-H Air Quality Management, Bldg. T130C, X2440

SUBJECT: AIR QUALITY REVIEW OF THE PROJECT TO EMPTY THE SOLAR PONDS CLARIFIER TANK - CAP-003-98

Ref: Letter #SMN-236-97 to distribution entitled " Review of the Project to Empty the Solar Ponds Clarifier Tank", dated December 17, 1997, the attached NEPA checklist, the preliminary project plan dated October 30, 1997, and Brown and Root laboratory data sheets, identification number 000-020-00-01 dated 06/04/92

Per your request, Air Quality Management/Radian International has evaluated the project to remove solar pond sludge from the Building 788 clarifier tank for air quality regulatory issues. The project has a potential to emit regulated air pollutants and was assessed to determine reporting, air permitting, regulatory approval, testing, recordkeeping, and monitoring requirements. This assessment is based on the following worst-case, bounding assumptions derived from information provided by project personnel:

- The tank is an open-top tank, has a capacity of 30,000 gallons, and currently contains approximately 16,500 gallons of sludge and water.
- The Brown and Root, Inc. laboratory analysis from 1992 is the most accurate and representative analysis of the sludge and water contained in the tank.
- For the purposes of this air assessment, radionuclide contamination is assumed to be 6,600 picocuries per gram (pCi/g) gross alpha (assumed to be americium 241), and 860 pCi/g gross beta (assumed to be plutonium 241) for the entire contents of the tank.
- The highest concentration volatile organic contaminant (VOC) level is tetrachloroéthylene (BIN A hazardous air pollutant) at 1,000 micrograms per kilogram. The highest concentration regulated inorganic contaminants are cadmium at 4,660 milligrams per kilogram (mg/kg), and chromium at 3,190 mg/kg (BIN A hazardous air pollutants).
- The average specific gravity for the tank contents is 1.28 (36% total dissolved solids).
- The project will utilize sparging and high pressure water sprayers to help mobilize the sludge during draining operations.
- Conservative estimates for cadmium and chromium emissions were calculated utilizing particulate emission factors for cooling towers.
- All fuel-fired compressors and generators utilized during the project will be existing on-Site units.

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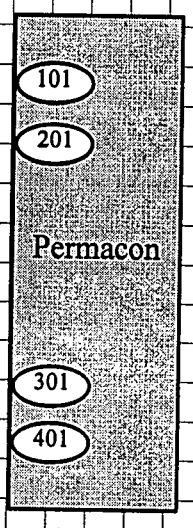
Building 788 Pad

Figure 3



Road Base Fill

Reduction Area
Location A

1A
6A
2A
4A
3A
5A

Clarifier
Pad

N

0 FEET 30

0 METERS 10

Figure 2

Size Reduction Area
Location B

9B
C-Pond
7B
12B
10B
13B
8B
11B
14B

Test Well

SURVEY MAP LEGEND

(#) Sample Location

Soil Boundary

Roped Area

RF/RMRS-99-426.UN
Page 12A-34 of 12A-35

RL1

Building 788 Pad

Figure 1