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CLOSURE REPORT

DECONTAMINATION OF THE FORMER BLISS & LAUGHLIN FACILITY

BUFFALO, NEW YORK

PREPARED FOR

UNITED STATES ARMY CORPS OF ENGINEERS
BUFFALO DISTRICT

PREPARED BY

RADIAN INTERNATIONAL
A DAMES & MOORE GROUP COMPANY

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Declaration of Remedial Action Completion & Issuance of the Closure Report

The remedial action at the former Bliss and Laughlin Facility has been completed in accordance with the Record of Decision (ROD) signed December 11, 1998 and in compliance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan. As a result of the remedial action, no radioactive material remains on-site above the cleanup level established in the ROD and no further action will be required at the site.

BG Hans A. Van Winkle
Deputy Commander for Civil Works
20 Massachusetts Avenue, NW
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30 Sep 99
Date

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LIST OF ACRONYMS

AEC	- Atomic Energy Commission
ALARA	- as low as reasonably achievable
ARAR	- applicable or relevant and appropriate requirement
BNI	- Bechtel National, Inc.
CERCLA	- Comprehensive Environmental Response, Compensation, and Liability Act
CFR	- Code of Federal Regulations
cm	-centimeter
cy	-cubic yard
DCGL	- Derived Concentration Guideline Level
DOE	- Department of Energy
dpm	- disintegrations per minute
ft	- foot/feet
FS	- Feasibility Study
FSS	- Final Status Survey
FUSRAP	- Formerly Utilized Sites Remedial Action Program
g	- gram
MARSSIM	- Multi-Agency Radiation Survey and Site Investigation Manual
MCL	- Maximum Concentration Level
MDC	- Minimum Detectable Concentration
MED	- Manhattan Engineer District
Mrem	- millirem
NRC	- Nuclear Regulatory Commission
NYSDEC	- New York State Department of Environmental Conservation
NYSDOL	- New York State Department of Labor
PP	- Proposed Plan
RI	- Remedial Investigation
ROD	- Record of Decision
TEDE	- Total Effective Dose Equivalent
U	- Uranium
USACE	- United States Army Corps of Engineers

EXECUTIVE SUMMARY

The United States Atomic Energy Commission (AEC), a predecessor of the Department of Energy (DOE), established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to identify, investigate, and remediate or control sites contaminated as a result of activities performed as part of the nation's early atomic energy program. On October 13, 1997, the Energy and Water Development Appropriations Act was signed into law, transferring the responsibility for the administration and execution of FUSRAP from the DOE to the United States Army Corps of Engineers (USACE). USACE is required to conduct response actions at FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The CERCLA process for response actions is established in the NCP.

The purpose of this closure report is to complete the Administrative Record to demonstrate compliance with CERCLA and the NCP in the conduct of response actions at the Bliss & Laughlin Site, Buffalo, NY and completion of all necessary remedial actions in accordance with the Record of Decision (ROD).

The Bliss & Laughlin Site is located at 110 Hopkins Street in Buffalo, New York and consists of a single large building (slab on grade). Historically, this facility was the site of uranium metal machining. Therefore, the primary radiological constituent of concern is natural uranium. The site was assigned to FUSRAP in 1992, based upon a designation survey performed by the Oak Ridge Institute for Science and Education (ORISE).

A site characterization was performed by Bechtel National Inc. (BNI) for the DOE. The results of this radiological and chemical characterization showed locations of elevated activity on the overheads and floor surfaces of the former Special Finishing Area.

A Remedial Investigation, conducted by USACE, identified Subpart E of 10 CFR 20 as being considered relevant and appropriate to the remedial action, i.e. an ARAR. The results of the radiological surveys conducted during the characterization were evaluated against the considered ARAR and it was determined that levels of contamination at the site were high enough such that

dose levels would exceed the 25 mrem/yr standard in the ARAR for a typical building occupancy scenario.

A Feasibility Study, also conducted by USACE, identified three alternatives for site remediation. These were No Action, Continued Institutional Controls, and Decontamination of Building.

The alternatives described in the Feasibility Study were evaluated using CERCLA criteria to determine the most appropriate actions for cleanup of the Bliss & Laughlin site. These criteria were established to ensure that the remedy is protective of human health and the environment, meets regulatory requirements, is cost effective, and uses permanent solutions and treatment to the maximum extent practicable.

Alternative 3, Decontamination of Building, was selected as the preferred alternative for site remediation, and was presented as the Proposed Plan. On September 28, 1998, USACE issued the Remedial Investigation, Feasibility Study and Proposed Plan (RI/FS/PP) for the proposed cleanup of the Bliss & Laughlin site. The public and agencies were invited to submit comments on the RI/FS/PP. Two agencies, the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Labor (NYSDOL), submitted comments on the RI/FS/PP. No comments were received from the public.

USACE issued the Record of Decision (ROD) in December of 1998, the decision document that presented the selected remedy for the Bliss & Laughlin Site. This remedy was chosen in accordance with CERCLA and the NCP. Alternative 3, Decontamination of Building, was the selected remedy. The ROD concluded that if the selected remedy was implemented and completed, no further action would be required at the site.

Pre-remediation surveys were completed in early December 1998. Decontamination procedures started immediately thereafter and continued through March 1999. A post-remediation survey was conducted per a Final Status Survey Plan and a Final Status Survey Report was prepared. Results of the post-remediation survey indicated that the remaining radiological contaminants were below the levels required to meet the dose specified in the ARAR.

A Quality Assurance and Independent Technical Review Plan was prepared by USACE to document quality assurance activities and provide the framework for conducting an independent review of the final status survey data at the site. This plan was used to confirm that residual contamination met cleanup goals specified in the ROD.

This closure report demonstrates completion of all necessary remedial actions in accordance with the ROD, demonstrates compliance with CERCLA and the NCP and completes the Administrative Record for the Bliss & Laughlin Site.

1.0 INTRODUCTION

1.1 Purpose

The United States Atomic Energy Commission (AEC), a predecessor of the Department of Energy (DOE), established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to identify, investigate, and remediate or control sites contaminated as a result of activities performed as part of the nation's early atomic energy program. On October 13, 1997, the Energy and Water Development Appropriations Act was signed into law, transferring the responsibility for the administration and execution of FUSRAP from the DOE to the United States Army Corps of Engineers (USACE). USACE is required to conduct response actions at FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The CERCLA process for response actions is established in the NCP.

The purpose of this closure report is to complete the Administrative Record to demonstrate compliance with CERCLA and the NCP in the conduct of response actions at the Bliss & Laughlin Site, and completion of all necessary remedial actions in accordance with the Record of Decision (ROD).

1.2 History of Response Action

The Bliss & Laughlin Site is located at 110 Hopkins Street in Buffalo, New York and consists of a single large building (slab on grade). Refer to Figure 1 for a site plan. Historically, this facility was the site of uranium metal machining. Therefore, the primary radiological constituent of concern is natural uranium. The site was assigned to FUSRAP in 1992, based upon a designation survey performed by the Oak Ridge Institute for Science and Education (ORISE).

A site characterization was performed by Bechtel National Inc. (BNI) for the DOE. The results of this radiological and chemical characterization are described in a 1995 Technical Memorandum (BNI, 1995). In summary, locations of elevated activity were noted on the overheads and floor surfaces of the former Special Finishing Area.

The Remedial Investigation (USACE, September 1998), identified Subpart E of 10 CFR 20 as being considered relevant and appropriate to the remedial action, i.e. an ARAR. The results of the radiological surveys conducted during the characterization were evaluated against the considered ARAR and it was determined that levels of contamination at the site were high enough such that dose levels would exceed the 25 mrem/yr standard in the ARAR for a typical building occupancy scenario.

The Feasibility Study (USACE, September 1998), identified three alternatives for site remediation. Alternative 1, No Action, assumed that the facility is abandoned and institutional controls are discontinued. Alternative 2, Continued Institutional Controls at the site, assumed continued use of the site as an industrial facility, maintaining signs and fencing, continued maintenance and monitoring, restrictions of future use, and periodic inspections. Alternative 3, Decontamination of Building, assumed that contamination on the floors, walls, and overheads would be removed using appropriate decontamination technologies to a level sufficient to meet the ARAR. It was determined that for large areas, decontamination to levels below 1500 dpm/100cm^2 would result in a dose below the 25 mrem/yr ARAR level. However, the area in the Special Finishing Area is small and therefore a comparison was made to standards in Regulatory Guide 1.86, which is for much smaller areas. It was determined that decontamination to the levels in Regulatory Guide 1.86 for a small area (which is 5,000 dpm/100cm^2) would result in levels below 1500 dpm/100cm^2 when averaged over a large area and therefore would be below the 25 mrem/yr ARAR level. The USACE also proposed to conduct additional decontamination under this alternative to achieve as low as reasonably achievable (ALARA) levels. This required removal of surface contamination from areas with levels above 2,000 dpm/100cm^2 (i.e., 2,000 dpm/100cm^2 averaged over not more than 1 m^2 versus the 5,000 dpm/100cm^2 in Regulatory Guide 1.86). These decontamination efforts would remove most of the surface contamination and result in dose levels well below the 25mrem/yr level specified in the ARAR.

In addition to the surface contamination cleanup level of 2,000 dpm/100cm^2, established in the Feasibility Study, a cleanup goal for contamination in soils was also determined. The technical memorandum entitled "Cleanup Goals for Soil at the Finishing Area of the Former Bliss &

Laughlin Facility" (USACE, December 1998) established that a soil concentration of 100 pCi/g of U-238 would meet the dose standard of the ARAR, allowing unrestricted use of the facility.

The alternatives described in the Feasibility Study were evaluated using CERCLA criteria to determine the most appropriate actions for cleanup of the Bliss & Laughlin site. These criteria were established to ensure that the remedy is protective of human health and the environment, meets regulatory requirements, is cost effective, and uses permanent solutions and treatment to the maximum extent practicable.

Alternative 3, Decontamination of Building, was recommended as the preferred alternative for the final remedy for the site in the Proposed Plan. This alternative was the most protective of human health and the environment and eliminated the continuing costs for monitoring and periodic reviews. On September 28, 1998, USACE issued the Remedial Investigation, Feasibility Study and Proposed Plan (RI/FS/PP) for the proposed cleanup of the Bliss & Laughlin site. The public and agencies were invited to submit comments on the RI/FS/PP and written comments were accepted until the end of October 1998. Two agencies, the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Labor (NYSDOL), submitted comments on the RI/FS/PP. The New York State Department of Environmental Conservation (NYSDEC) agreed with the selection of Alternative 3 as the preferred remedy. No comments were received from the public.

USACE issued the Record of Decision (ROD) in December of 1998, the decision document that presented the selected remedy for the Bliss & Laughlin Site. This remedy was chosen in accordance with CERCLA and the NCP. Alternative 3, Decontamination of Building, was the selected remedy. The ROD concluded that if the selected remedy was implemented and completed, no further action would be required at the site.

Pre-remediation surveys were completed in early December 1998. Decontamination procedures started immediately thereafter and continued through March 1999.

An additional area of contamination was discovered during the remediation process. This was a trench that runs north-south in the former Special Finishing Area. The trench contained radioactive metal shavings and miscellaneous debris as was originally expected in the trench

identified in the ROD. The additional contamination was in the same basic location and had the same characteristics as previously identified in the ROD and therefore the remedy selected in the ROD was not changed, and could be applied to the additional trench remediation. The trench was cleaned, scabbled, jack-hammered, and sand-blasted in order to assure that all contamination was removed.

A post-remediation survey was conducted per a Final Status Survey Plan and a Final Status Survey Report was prepared. Results of the post-remediation survey indicate that the remaining radiological contaminants are below the levels required to meet the dose specified in the ARAR and the application of ALARA.

A Quality Assurance and Independent Technical Review Plan was prepared by USACE to document quality assurance activities and provide the framework for conducting an independent review of the final status survey data at the site. This plan was used to confirm that residual contamination met cleanup goals specified in the ROD.

1.3 Remedial Action Guidelines

Remedial action objectives established for the Bliss & Laughlin Site in the December 1998 ROD formed the basis for the scope of the remediation that was conducted. Remedial action objectives were established based on a review of potential Applicable or Relevant and Appropriate Requirements (ARARs) as defined in CERCLA.

In the ROD, USACE determined that Subpart E of 10 CFR 20 was not applicable, however, it was relevant and appropriate in considering the remediation of the Bliss & Laughlin Site because the activities and resulting contaminates were similar to those that would have required an NRC license.

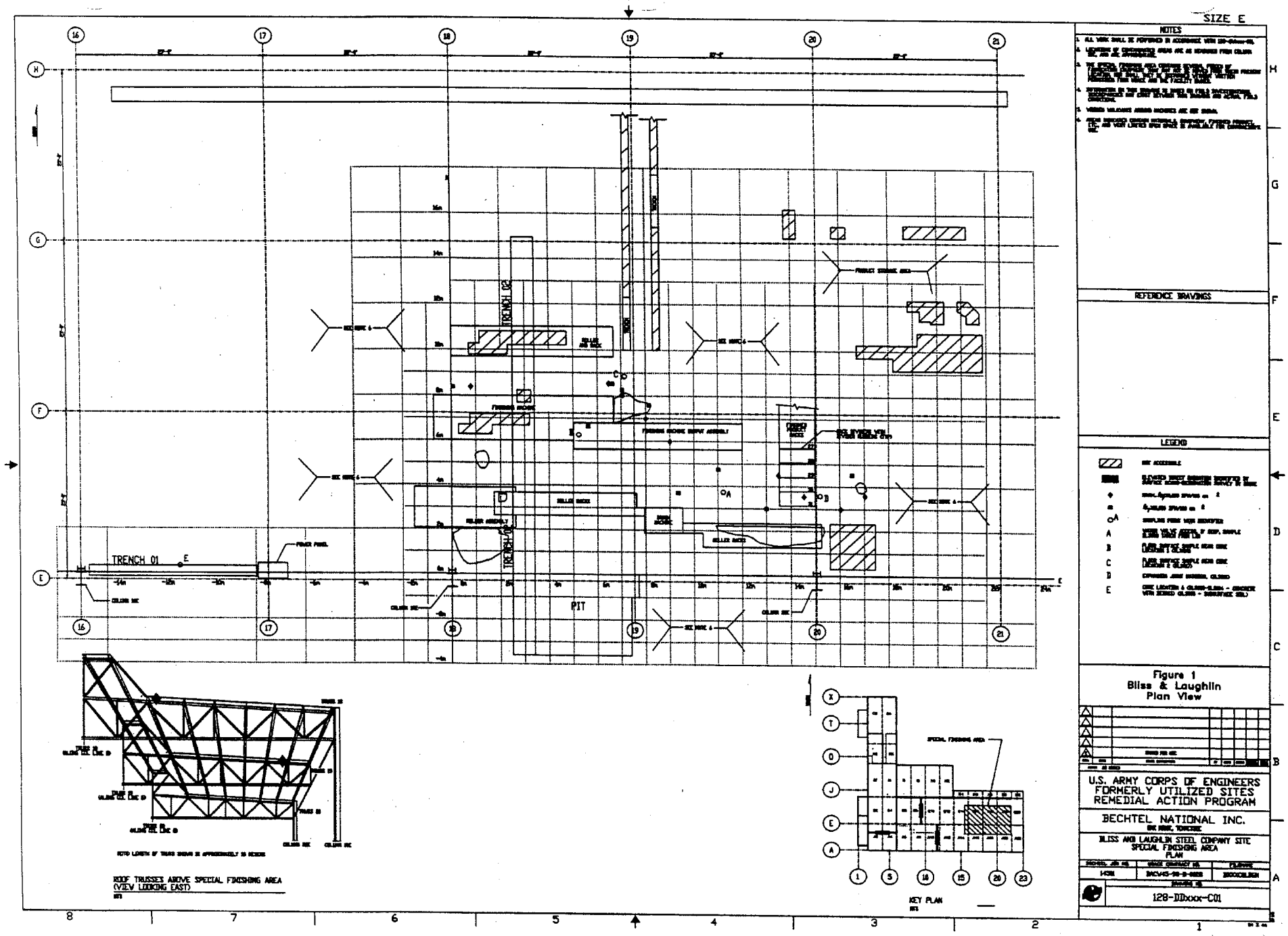
Subpart E of 10 CFR 20 was promulgated by the Nuclear Regulatory Commission (NRC) to establish criteria for residual radioactivity allowable at sites licensed by NRC that are being decommissioned. Under those criteria, a site will be considered acceptable for unrestricted use if the residual activity that is distinguishable above background radiation results in a total effective dose equivalent (TEDE) to an average member of a critical group that does not exceed 25 mrem/yr and the residual radioactivity has been reduced to levels which are as low as reasonably

achievable (ALARA). At the Bliss and Laughlin Site, the only reasonable foreseeable use of the facility where radioactive contamination exists is industrial. Therefore the appropriate critical group was determined to be industrial workers.

It was determined that decontamination to levels in Regulatory Guide 1.86 would result in average levels in the former Special Finishing Area below the 1500 dpm/100cm^2 large area average, which would result in a dose below the 25 mrem/yr ARAR level. The USACE also decided to conduct additional decontamination under this alternative to achieve as low as reasonably achievable (ALARA) levels. This required removal of surface contamination from areas with levels above 2,000 dpm/100cm^2 (i.e., 2,000 dpm/100cm^2 averaged over not more than 1 m^2 versus the 5,000 dpm/100cm^2 in Regulatory Guide 1.86), which would result in dose levels well below the 25 mrem/yr level specified in the ARAR.

In addition to the cleanup goal of 2,000 dpm/100cm^2 for surface contamination, it was determined that a cleanup level for U-238 in soil of 100 pCi/g or less would result in dose levels well below the 25 mrem/yr level specified in the ARAR (USACE, December 1998).

Fig


SIZE E
NOTES
REFERENCE DRAWINGS
LEGEND
TRENCH 01
TRENCH 02
PIT
ROOF TRUSSES ABOVE SPECIAL FINISHING AREA
(VIEW LOOKING EAST)
KEY PLAN
Figure 1
Bliss & Laughlin
Plan View
U.S. ARMY CORPS OF ENGINEERS
FORMERLY UTILIZED SITES
REMEDIAL ACTION PROGRAM
BECHTEL NATIONAL INC.
BLISS AND LAUGHLIN STEEL COMPANY SITE
SPECIAL FINISHING AREA
PLAN
128-DDxxx-C01

2.0 REMEDIATION METHODOLOGY

2.1 Pre-Remediation Surveys

Radian performed pre-remediation surveys (Tables 4-1 to 4-5) to identify and confirm the findings of the 1995 BNI investigation. A scan survey was conducted over 25% of the surfaces on the overhead trusses and ceiling above the Special Finishing Area using a beta/gamma detector (Ludlum 2221 with 44-9 detector), while the floor area was surveyed using a three-phase approach:

- A Level I survey was performed in the areas documented under the BNI report to be 15,000 dpm/100 cm^2 or greater. This survey consisted of dividing the subject area into 1 m^2 grids, performing a 100% scan of the subject area, performing direct measurements in 50% of the grids by obtaining five one-minute readings (four corners and center) in alternating grids. Both a beta/gamma (Ludlum 2221 with 44-9 detector) and alpha probe (Ludlum 2221 with 43-5 detector) were used for the Level I survey.
- A Level II survey was subsequently performed over a 6 meter area surrounding the previously identified "hot spots". The Level II survey consisted of a 50% scan using a sodium iodide detector (Ludlum 2221 with a 44-19 detector). Level II surveys were typically performed in walkways and heavy traffic areas.
- A Level III survey was performed covering 25% of the remainder of the building (i.e., outside the boundaries of the Special Finishing Area) to confirm that no additional areas contained elevated radiation levels. The Level III survey was performed using a sodium iodide detector (Ludlum 2221 with a 44-19 detector).

Copies of all surveys, including floors, overheads, trench areas, and equipment are provided as Attachment B.

2.2 Remediation Techniques

2.2.1 Trusses

Trusses were remediated by scraping, wiping with maselin and then using a HEPA vacuum cleaner to remove dust from the trusses and other horizontal surfaces. Man lifts were used to reach the trusses. All existing facility equipment was covered prior to performing any decontamination activities.

2.2.2 Steel Supports

The steel support columns within the Special Finishing Area were not found to be contaminated during the pre-remediation survey. No remediation was performed on these structures.

2.2.3 Floor

A concrete scabbler and jackhammer with scabbler head was used to remove surface contamination on the concrete floor. In some instances a small jackhammer was used to remove contamination that was greater than 2 inches deep. A containment system fitted with a HEPA filtration unit was built that enclosed the scabbling operation.

2.2.4 Trenches

The concrete poured over Trench 01, which is west of the Special Finishing Area, was removed using a jack hammer. Once the concrete was removed, several pipes with soil-like fill were located at a depth of approximately 8 inches. The concrete and fill material were field surveyed and sampled (samples 01, 02 and 03) and were not contaminated. No remediation of these materials was performed.

A second utility trench was encountered during the decontamination process. This utility trench system (Trench 02) was also located in the Specialty Finishing Area and extended north to south and beyond the Specialty Finishing Area. At the end of this second trench system was a pit, approximately 12'x12'x9'in size. The second trench system and pit area was found to contain metal shavings and debris as was originally anticipated in Trench 01. The trench was decontaminated using several different methods. The concrete pad covering the trench was removed using a jackhammer. The contaminated debris including metal shavings was removed manually from the trench. Once the debris was removed from the trench, oil-absorbent material was used to remove residual oil. The trench was scanned to determine which areas were contaminated. Decontamination methods included scabbling the trench floor and walls with a jackhammer mounted scabbler, a jack hammer, and sand blasting.

2.2.5 Finishing Pit

The finishing pit within the Special Finishing Area was not found to be contaminated based on field instrumentation readings and analytical results of samples collected from the pit area (See discussion in Section 3.0). No remediation was performed on these materials.

2.3 Post-Remediation Surveys

A post-remediation survey was conducted per the Final Status Survey Plan in the manner shown in Figure 2. The number of survey points and the configuration of the sampling locations was determined using the Wilcoxon Rank Sum (WRS) methodology because the radionuclide of concern is also present in the background. The calculation takes into account Type I and Type II error and the shift, which is determined by the lower bound of the gray region (LBGR), and the standard deviation of pre-remediation survey results. A complete description of the calculations of the WRS and the sample areas can be found in section 4.0 of the Final Status Survey Plan (Radian/Dames & Moore, 1999).

The locations included in the post-remediation survey were the cement floor, the overhead trusses, the steel supports, Trench 01 and Trench 02, and the finishing pit. All locations, excluding the steel columns, were found to be contaminated prior to remediation and therefore needed to be surveyed following decontamination activities. The steel columns were surveyed due to the possibility of becoming contaminated during remediation processes. A summary of the results of the post-remediation survey and how they compare to the cleanup level is described in Section 4.0, Summary and Conclusions, and Attachment A of this report.

2.4 Survey Instrumentation and Methods

In general, guidance on the survey techniques and information on the use of specific materials and equipment were obtained from draft NUREG/CR-5849 ORAU-92/C57, *Manual for Conducting Radiological Surveys in Support of License Termination*. For the Final Status Survey, scanning, direct measurement and sampling guidance from Chapter 6, Field Measurements and Instrumentation, of *the Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) were followed. MARSSIM guidance was used because it provides standardized and consistent approaches for planning, conducting, evaluating and documenting environmental radiological surveys, with a specific focus on the Final Status Survey that is carried out to demonstrate compliance with cleanup regulations.

Survey methods included scans of surfaces followed by direct measurements near the surface being decontaminated or surfaces being verified as containing acceptable levels of residual radioactivity. Surfaces are scanned to identify the presence of elevated direct radiation, which indicate residual gross activity or hot spots. Direct measurements are static measurements over a location to determine the total amount of surface residual contamination (removable and fixed). Sampling refers to taking swipes to measure removable surface contamination.

The surface activity levels were compared to the clean-up levels and a determination was made on the need for further decontamination efforts. The project Data Quality Objectives (DQOs) controlled the selection of instrumentation, calibration of instruments, quality control replicates, reference, blank measurements, laboratory sample analysis, measurement system Minimum Detectable Concentration (MDC) and measurement errors. Survey instrumentation and techniques were selected based on the detection capabilities for the known contaminant (U-238) and the clean-up levels to be achieved.

A Ludlum 2221 with a 43-5 or a 44-9 detector or equivalent probe was used. The actual scan minimal detectable concentration (MDC) for this instrument with a 43-5 probe (zinc sulfide scintillator used to measure alpha radiation) or a 44-9 probe (used to measure beta/gamma radiation) is approximately 150 Bq/m^2 (90 $dpm/100cm^2$). The probability of detecting 300 $dpm/100cm^2$ of alpha activity while scanning with alpha proportional or scintillation detectors, with detection efficiency of 15% and a scan rate of about 3 cm/s is over 90% (Section 4.0 of the Final Status Survey Plan (Dames & Moore, 1999)).

2.5 Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) procedures were implemented throughout the remedial actions at the Bliss & Laughlin facility. QA/QC consisted of initial confirmation measurements of the areas of concern (pre-remediation surveys), field measurements during the decontamination efforts, re-surveying at the completion of the decontamination efforts, and an independent survey performed by the USACE. Calibration checks, response checks, air monitoring pump calibrations, and access controls were also performed as part of the QA/QC function.

Upon completion of remediation, Radian conducted a Quality Control (QC) scan survey of the areas remediated. The objective of the QC scan was to evaluate direct radiation levels across the areas with respect to the site clean-up level established in the ROD. During the QC scan, areas which exceeded the clean-up level were delineated in the field and were remediated and rescanned to confirm that contamination levels were below the clean-up level.

Additional QA/QC was performed on the samples submitted for laboratory analysis. This included blanks samples as well as data validation.

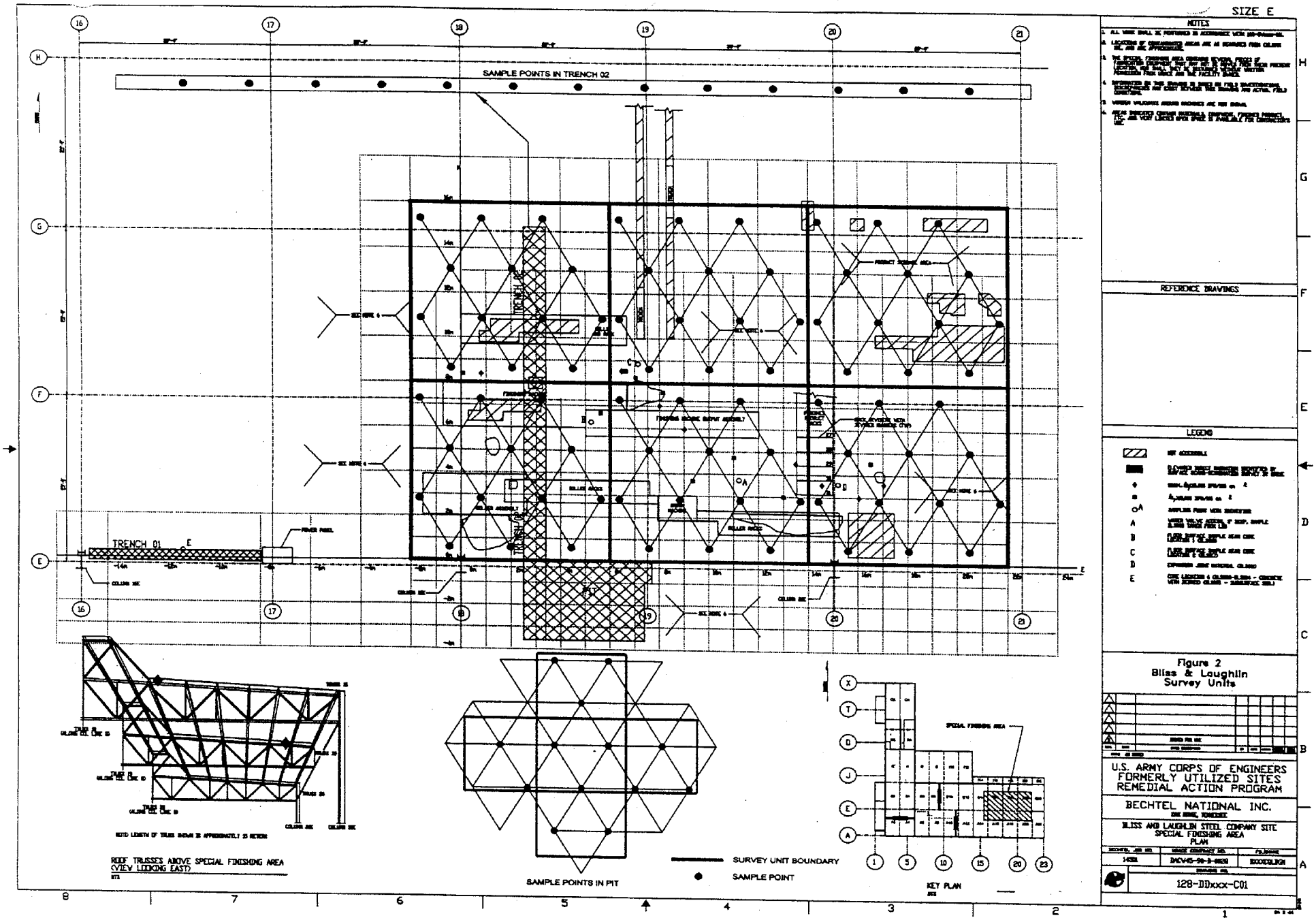
Upon completion of Radian's QC process, USACE performed a Quality Assurance (QA) review of the data and conducted a confirmation survey of each final status survey unit to confirm the results of the contractor QC surveys. USACE QA procedures were performed as specified in "Quality Assurance and Independent Technical Review Plan for Bliss & Laughlin Site Final

Status Survey Results" (USACE, March 1999). The USACE confirmation survey included conducting a scan survey over a portion of each final status survey unit. Areas identified as exceeding the cleanup level were delineated and remediated by Radian. Follow up QC surveys of the delineated areas were performed by Radian to confirm that contamination levels were below the cleanup level. USACE then performed an additional QA survey of the areas to confirm that contamination levels were below cleanup levels.

The USACE QA process also included confirmation of the MARSSIM final status surveys conducted by Radian. USACE performed duplicate surveys of a portion of the designated MARSSIM final status survey sample points and evaluated both Radian and USACE final status survey results to confirm the contamination levels were below the cleanup level.

In addition, the USACE QA process consisted of having a full-time USACE construction inspector on-site with periodic oversight by USACE technical specialists during the remediation to ensure that plans and proper procedures were utilized.

Fig


SIZE E
NOTES
REFERENCE DRAWINGS
LEGEND
SAMPLE POINTS IN TRENCH 02
TRENCH 01
ROOF TRUSSES ABOVE SPECIAL FINISHING AREA (VIEW LOOKING EAST)
SAMPLE POINTS IN PIT
SURVEY UNIT BOUNDARY
SAMPLE POINT
KEY PLAN
Figure 2
Bliss & Laughlin
Survey Units
U.S. ARMY CORPS OF ENGINEERS
FORMERLY UTILIZED SITES
REMEDIAL ACTION PROGRAM
BECHTEL NATIONAL INC.
BLISS AND LAUGHLIN STEEL COMPANY SITE
SPECIAL FINISHING AREA
PLAN
128-DDxxx-C01

3.0 OVERVIEW OF REMEDIATION

3.1 Summary of Work Performed

The following summarizes the work performed. Additional detail of the remediation/decontamination of the trusses, floor areas and the trench systems is provided in Attachment C.

3.2 Discussion of Truss Remediation Area

3.2.1 Description of Area

As described in the Record of Decision, trusses 18, 19 & 20, which are located above the Special Finishing Area, were contaminated (USACE, 1998). In the initial assessment of the trusses approximately 53 linear ft. (16 linear meters) was found to be contaminated. Upon a re-survey of the area, additional areas on the trusses and on perpendicular cross members were found to be contaminated above the cleanup level.

3.2.2 Description of Work Done

The ceiling trusses and perpendicular members were decontaminated. Personnel in man lifts were used to access the ceiling trusses. Those areas as determined by the pre-remediation survey that had surface contamination in excess of 2,000 dpm/ 100cm^2 total activity were decontaminated by scraping and using a HEPA vacuum and, when needed, were wiped with maselin. Once the areas where vacuumed, the radiological control technician confirmed that the area was less than 2,000 dpm/100 cm^2. The trusses and cross members were then surveyed and found to be less than 2,000 dpm/100 cm^2. Following Radian's survey, the USACE performed a confirmation survey of the truss areas. Of the six areas, three did not meet the cleanup level. These areas were re-vacuumed and resurveyed by USACE and found to meet the cleanup level.

3.2.3 Achievement of the ROD Clean-up Levels

In the ROD, the remedial action guidelines set for achieving compliance with the ARAR and ALARA on trusses was 2000 dpm/100 cm^2 for total surface activity as discussed in Section 1.3.

The total alpha surface activity on the trusses that was measured during the final status survey (FSS) ranged from less than the MDC to 98 dpm/100 cm^2 with an average surface activity of 26 dpm/100 cm^2. The range for the total beta contamination is less than the MDC to 803 dpm/100 cm^2 with an average surface activity of 69 dpm/100 cm^2. Therefore the residual surface activity on the trusses is less than the cleanup goal of 2000 dpm/100 cm^2.

3.3 Discussion of Floor Remediation Area

3.3.1 Description of Area

The concrete floor of the Special Finishing Area consists of 3,230 sq. ft. (300 m^2). The original assessment identified six areas requiring decontamination with approximately 97 sq. ft. (9 m^2) at 1 inch (2.54 cm) thickness. When remediation was completed, over 15 areas were decontaminated with the size ranging from less than 11 sq. ft. (1 m^2) to in excess of 43 sq. ft. (4 m^2).

3.3.2 Description of Work Done

The concrete floors were scabbled. For the scabbling operation, an enclosure with a HEPA filtration unit was constructed to capture dust generated from the operation. A HEPA vacuum was used to remove concrete debris and dust during and after scabbling. Before scabbling of the floor began, oil soaked speedy dry was removed from the floor. Areas exceeding 2,000 dpm/100 cm^2 total surface activity, as identified on the initial assessment and also the pre-remediation survey, were scabbled to below this level. The areas were then surveyed by Radian. Following Radian's survey, the USACE performed a confirmation survey of the floor area to confirm that surface activity levels were below the cleanup levels.

3.3.3 Achievement of the ROD Clean-up Levels

In the ROD, the remedial action guidelines set for achieving compliance with the ARAR and ALARA on concrete was 2000 dpm/100 cm^2 for total surface activity level as discussed in Section 1.3.

The total alpha activity level of the finishing floor measured during the FSS ranges from less than the MDC to 112 dpm/100 cm^2 with an average surface activity level of 23 dpm/100 cm^2. The total beta activity level ranges from less than the MDC to 1249 dpm/100 cm^2 with an average surface activity level of 129 dpm/100 cm^2. Therefore the residual surface activity level on the floor is less than the cleanup goal of 2000 dpm/100 cm^2.

3.4 Discussion of Trench Remediation Area

3.4.1 Description of Area

The original trench (Trench 01) in the scope of work was located outside of the Special Finishing Area between Trusses 16 and 17. A core sample indicated slightly elevated readings for uranium-238. The trench (5 ft. (1.5 meters) wide, 30 ft. (9 meters) long, and 7.8 inches (0.2 meters) deep) was located next to the crane rail foundation.

The second trench (Trench 02) at approximately 8 ft. (2.5 meters) east of Truss 18 was located during remediation of the concrete floor. In the process of decontaminating the concrete floor, a section of concrete was removed, revealing Trench 02. Trench 02 contained oily debris and metal shavings. These metal shavings were radiologically contaminated.

3.4.2 Description of Work Done

The concrete pad over Trench 01 was removed to reveal 4 pipes, 2 of which had been disconnected and placed on a soil-like fill material. The trench depth was approximately 0.2 meters (8 inches) deep. Field measurements indicated that the surface activity of the trench was below the cleanup level (2,000 dpm/100 cm^2). Three samples of fill material were sent for laboratory analysis for uranium content for comparison to the soil cleanup level. The results indicated a maximum level of U-238 at 10 pCi/g or less, which is below the established soil cleanup level of 100pCi/g (USACE, December 1998), and therefore the soil was not removed from the trench. After USACE confirmation sampling confirmed that cleanup levels had been met, Trench 01 was filled with concrete.

The second trench system (Trench 02), located in the Special Finishing Area, was discovered while using a jackhammer to decontaminate the concrete floor. The concrete pad over Trench 02 was removed to determine the extent of the trench, making it necessary to move existing equipment (Rollers 1 and 2 as well as a hot water bath and heater) to give full access to the trench. Trench 02 was found to contain metal shavings and oily debris for which surface activity readings were above the cleanup level (2,000 dpm/100 cm^2). The debris and metal shavings were removed and the trench was decontaminated using a combination of sandblaster, scabbler and needle-gun (similar to a small jackhammer) until surface contamination readings were below the cleanup level. This trench was not backfilled as the current facility operator intends to utilize the trench as a pipe trench or conduit.

A pit was discovered adjacent to Trench 02. The pit contained debris such as metal, wire, wood, and stone as well as a rail or track thought to have been part of a conveyor system. Underneath the debris was a layer of oil-soaked soil and adsorbent. Field measurements of the pit indicated that surface activity levels were below the cleanup level of 2,000 dpm/100 cm^2. The debris was removed from the pit and three samples were taken of the soil and adsorbent at the bottom of the pit at depths of 1 ft. (0.3 m), 4ft. (1.2 m) and at the bottom. Laboratory analysis of the samples yielded results for U-234, U-235, and U-238 of less than 1 pCi/g. Four core samples, taken along the western edge of the pit adjacent to the trench and one sample taken on the eastern side of the pit in the center, were surveyed (direct measurements). The results were compared to background with no surface activity above background being detected on these corings. Because both the soil samples and direct measurements indicated that surface activity was below the cleanup levels, no further decontamination was conducted, and the soil/absorbent was left in place.

During the core drilling of the pit, using water to cool the bits generated wastewater. This wastewater was disposed of at Evergreen Environmental/Republic Environmental Systems, Inc..

All jack hammering, scabbling and sand blasting operations were conducted in an enclosure with HEPA filtration.

The final status survey was performed and was found to be below the cleanup level. The USACE performed confirmation sampling, confirmed that these areas met the clean-up level, and the pit was backfilled with concrete.

3.4.3 Achievement of the ROD Clean-up Levels

In the ROD, the remedial action guidelines set for achieving compliance with the ARAR and ALARA for the previously identified trench (Trench 01) was 2000 dpm/100 cm^2 for total surface activity as discussed in Section 1.3. In addition, a cleanup level of 100pCi/g of U-238 was established for contaminated soils. Since the nature, level, and source of contamination in the second trench (Trench 02) was the same as that found in Trench 01, the same remedial action guidelines were followed. The changes were not considered to be either significant or fundamental. No changes to the cleanup levels were needed. Therefore, no new public comment period was necessary, and the site characterization and the remedial action on which the public had commented were not materially changed.

The total alpha surface activity of Trench 01 from the FSS ranges from less than the MDC to 112 dpm/100 cm^2 with an average surface activity of 43 dpm/100 cm^2. The total beta contamination of Trench 01 ranges from less than the MDC to 1605 dpm/100 cm^2 with an average surface activity of 373 dpm/100 cm^2. The total alpha surface activity of Trench 02 ranges from 14 dpm/100 cm^2 to 84 dpm/100 cm^2 with an average surface activity of 48 dpm/100 cm^2. The total beta surface activity of Trench 02 ranges from 297 dpm/100 cm^2 to 1219 dpm/100 cm^2 with an average surface activity of 569 dpm/100 cm^2. Therefore the residual surface activity at Trenches 01 and 02 are less than the limit of 2000 dpm/100 cm^2 established to assure compliance with the ARAR.

Based upon the FSS, the finishing area pit had total alpha surface activity ranging from less than the MDC to 70 dpm/100 cm^2 with an average surface activity level of 10 dpm/100 cm^2. The total beta surface activity of the finishing area pit ranged from less than the MDC to 119 dpm/100 cm^2 with the average surface activity being less than the MDC. Therefore the finishing pit complies with the surface activity cleanup level. In addition, the three samples taken of the soil and absorbent at the bottom of pit resulted in U-234, U-235, and U-238 concentrations less than 1 pCi/g for each isotope in each sample. Therefore the material in the bottom of the pit meets the soil cleanup level of 100 pCi/g of U-238.

4.0 SUMMARY AND CONCLUSIONS

4.1 Summary of Work Performed

Performance of the selected remedial alternative for the Bliss & Laughlin site has been completed. Cleanup of the site involved the following components of work:

- Mobilizing to the site;
- Performing a pre-remedial radiological survey;
- Decontaminating permanent structures (i.e. floors and trusses);
- Removing radiologically contaminated material and non-radiologically contaminated material.
- Conducting a FSS to determine compliance with cleanup levels;
- Shipping removed material to appropriate disposal facilities;
- Performing site restoration; and
- Demobilizing from the site.

4.2 Radiation Protection Program

Radiation protection monitoring/dose analysis was also performed during the duration of the project. Radiation protection monitoring included air monitoring and TLD data analysis. The radiation protection program evaluated the release of and/or exposure to radiological constituents during the remediation of the facility. Based on the review of the air monitoring analytical data and TLD analysis, no releases or exposures were documented.

4.3 Waste Characterization

The remedial approach and decontamination effort produced both radiological and non-radiological waste streams. The waste streams consisted of the following types of construction debris:

- Oil dry,
- Poly sheeting,
- Concrete,
- Gravel,
- Crushed drums,
- PPE/misc. debris,
- Metal debris
- PVC piping, and
- Plastic hose

Approximately 60 cy of the construction debris was generated during the decontamination of the overheads, floors and trenches. All of this material was handled as radiologically contaminated. The construction debris was initially drummed during the decontamination process. At the end of the weekend shift, the drums were moved and dumped into lined and tarped 20-yard roll offs. The drums were subsequently crushed and placed into the roll offs. A total of three roll offs (WRP-347-25, WRB-314-25 and WRB-144-25) were used for the temporary storage of the material. The waste material in the roll-offs was disposed at Envirocare of Utah.

An additional 20 cy of non-radiologically contaminated construction debris was also generated as part of the decontamination effort. This material included concrete removed to access the trenches and material collected from the second trench system. This material was radiologically surveyed, sampled and handled as non-radiologically contaminated debris. This material was initially drummed and then subsequently transferred to a separate roll off for temporary storage. One 20-yard roll off (WRP-309-25) was used for this material. The non-radiologically contaminated debris was disposed at Waste Management of Ohio.

In accordance with the Waste Management Procedures, radiological surveys were performed weekly for each of the containers used for the storage of the radioactive construction debris. A final release survey of the outside of the containers was also performed to ensure compliance with 49 CFR 172.403 (DOT standards for radiation level at package surface of <0.5 mrem/hr for Type I and Type II packages) and 49 CFR 173.443 (DOT standard for Non-Fixed External Radioactive Contamination-Wipe Samples, 22 dpm beta-gamma/100 cm^2 and 2.2 dpm alpha/100 cm^2 averaged over the entire container). Copies of the release surveys are provided as part of the Radiological Surveys (Attachment B).

Detailed waste characterization sample and analysis is presented in Tables 4-1 through 4-5. Tables 4-1 through 4-5 present results only for those pollutants that were detectable. Copies of the analytical results and a site plan depicting sample locations are provided as Attachment D.

Table 4-1 presents the initial sample/analysis of the contents of the trenches and background soil samples. Seventeen samples were collected to initially characterize the material to assess presence/absence of Uranium (U) isotopes. These samples were all analyzed for U-234, U-235 and U-238. Three samples (B+L-SO-001, 002 and 003) were grab soil samples collected from Trench 01. Three samples (B+L-SO-004, 005 and 006) represent background soil samples. Sample B+L-ME-001 was a discrete sample consisting of metal shavings. Sample B+L-OI-001 was a discrete sample consisting of oil collected from the trench. Sample B+L-CO-001 was a grab sample collected from concrete (CO) removed from the trenches. Eight samples (B+L-DE-001 through 008) were composites (C) and/or grab samples of the debris (D) collected from the excavation (E) of the trenches.

Table 4-2 presents the sample (B+L-DE-009) of Trench 02 material submitted for initial characterization of hazardous constituents. Sample 009 was a bias sample consisting of concrete with metal shavings. This sample was analyzed for the following parameters:

- RCRA Metals
- Corrosivity (pH)
- Reactivity (sulfide/Cyanide)
- Ignitability
- Paint Filter Test
- Volatiles
- Semi-volatiles
- PCBs
- TCLP Herbicides/Pesticides
- Gamma Spectroscopy, and
- Uranium (234/235/238)

Table 4-3 presents the waste characterization of the material (such as oil-soaked soil, metal, wire, wood, and adsorbent) removed from the pit area associated with Trench 02. Samples B+L-DE-010, 011 and 012 were collected to assess the material in the pit and were collected at 1, 4 and 9 foot intervals. These samples were analyzed for U-234, U-235, and U-238.

Table 4-4 presents the analytical results of composite sample B+L-DE-013. Sample B+L-DE-013 was collected from the fourth roll off used for the temporary storage of the "clean" construction debris. This sample was analyzed for the following parameters:

- TCLP Metals
- Corrosivity (pH)
- Reactivity (sulfide/Cyanide)
- Ignitability
- TCLP Volatiles
- TCLP Semi-volatiles, and
- PCB

Table 4-5 presents supplemental data requested by the disposal facility related to the three roll-offs storing the contaminated material. This sample was a composite of the three roll-offs containing the radiological construction debris (i.e., sample 014 was a 5 point composite of one roll off, sample 014A a 5 point composite of the second roll off and 014B was a 5 point

composite of the third roll off then each of the three composite samples were composited). The composite sample was analyzed for Total Metals and TCLP Metals.

Table 4-1. Initial Uranium Analysis – Trench System Material

SAMPLE NO.	DATE	TYPE OF SAMPLE	LOCATION OF SAMPLE	SAMPLE RESULTS (pCi/g)
B&L-SO-001	3/14/99	Soil	Trench 1 - west side	U-234-13
				U-235-0.2
				U-238-10
B&L-SO-002	3/14/99	Soil	Trench 1 - center	U-234-1.1
				U-235-0.0
				U-238-1.3
B&L-SO-003	3/14/99	Soil	Trench 1 - east side	U-234-1.2
				U-235-0.0
				U-238-1.2
B&L-SO-004	3/14/99	Soil	Background - outside bldg. on north side	U-234-4.9
				U-235-0.1
				U-238-2.5
B&L-SO-005	3/14/99	Soil	Background - outside bldg. on west side	U-234-2.6
				U-235-0.0
				U-238-1.2
B&L-SO-006	3/14/99	Soil	Background - outside bldg. on south side	U-234-4.9
				U-235-0.0
				U-238-4.4
B&L-ME-001	1/16/99	Metal	Metal shavings in trench	U-234-329
				U-235-15
				U-238-332
B&L-OI-001	1/24/99	Oil	Oil in trench that was present after trench was cleaned	Th-234-4.8
				U-234-1.6
				U-235-0.1
				U-238-1.7
B&L-CO-001	2/7/99	Concrete	High reading concrete from trench	U-234-559
				U-235-107
				U-238-754
B&L-DE-001C	1/31/99	Debris	N 14.5	U-234-0.7
				U-235-0.7
				U-238-0.5
B&L-DE-002	1/31/99	Debris	Small pit - north of Finishing Area	U-234-0.08
				U-235-0.0
				U-238-0.2
B&L-DE-003C	1/31/99	Debris	E7	U-234-2.9
				U-235-0.07
				U-238-4.0
B&L-DE-004C	1/31/99	Debris	E8.5	U-234-0.4
				U-235-0.0
				U-238-0.7
B&L-DE-005	1/31/99	Debris	E8.5	U-234-1.8
				U-235-0.0
				U-238-1.3
B&L-DE-006	1/31/99	Debris	N16.5	U-234-0.8
				U-235-0.0
				U-238-0.5
B&L-DE-007C	1/31/99	Debris	N19	U-234-0.06
				U-235-0.0
				U-238-0.2
B&L-DE-008C	1/31/99	Debris	E22	U-234-0.7
				U-235-0.0
				U-238-0.8

Table 4-2. Initial Characterization Sample B&L-DE-009 Debris from the Trench Taken on 2/7/99

ANALYTE	CONCENTRATION	UNIT
TOTAL METALS		
Arsenic	33.2	mg/kg
Barium	273	mg/kg
Chromium	213	mg/kg
Lead	564	mg/kg
RCRA CHARACTERISTICS		
pH	6.76	Unit
Ignitability	>140	°F
SEMI-VOLATILES		
Naphthalene	2000	□g/kg
2-Methlnaphthalene	17000	□g/kg
bis(2-Ethylhexyl)	24000	□g/kg
GAMMA SPECTROSCOPY		
Protactinium 234	27.3	pCi/g
Protactinium 234 by Th-234	31000	pCi/g
Thorium 234	5030	pCi/g
Uranium 235	371	pCi/g
URANIUM		
Uranium 234	433	pCi/g
Uranium 235	110	pCi/g
Uranium 238	745	pCi/g

Table 4-3. Pit Waste Characterization Samples
B&L-DE-010, 011, 012 Taken on 2/28/99

ANALYTE	CONCENTRATION	UNIT
B&L-DE-010		
Uranium 234	0±.2	pCi/g
Uranium 235	0.2±.3	pCi/g
Uranium 238	0±.2	pCi/g
B&L-DE-011		
Uranium 234	0±.1	pCi/g
Uranium 235	0.3±.3	pCi/g
Uranium 238	0.2±.2	pCi/g
B&L-DE-012		
Uranium 234	0±.3	pCi/g
Uranium 235	0.7±.5	pCi/g
Uranium 238	0±.3	pCi/g

Table 4-4. Waste Characterization of Clean Construction Debris B&L-DE-013 Taken on 3/21/99

ANALYITE	CONCENTRATION	UNIT
METALS		
BARIUM	0.8	mg/l
RCRA CHARACTERISTICS		
Ignitability	>140	°F
pH	9.91	Units

Table 4-5. Supplemental Waste Characterization of Contaminated Debris B&L-DE-014 Taken on 3/21/99 & 3/23/99

ANALYTE	CONCENTRATION	UNIT
Metals		
Arsenic	28	mg/kg
Barium	67	mg/kg
Chromium	74	mg/kg
Lead	219	mg/kg
Mercury	0.1	mg/kg
Barium	0.4	mg/l

4.4 Hazard Determination Evaluation Approach

This section describes hazard determination definitions and the waste characterization process used to prepare waste streams for transportation and disposal during the decontamination of the Bliss & Laughlin facility. The analytical data tables and waste profiles (Attachment E) were used in the determination and characterization of the waste materials.

The primary contaminant at the Bliss & Laughlin facility was U-234 and U-238 and its associated decay products. These radioactive constituents are wastes generated by metal machining and straightening operations of uranium rods. The metal machining operations were performed in support of the Manhattan Engineering District (MED) operations.

Based on Radian's and the USACE Buffalo District's review and evaluation of the applicable regulations and classifications, the radiological component of the waste material associated with Bliss & Laughlin (roll offs WRP-347-25, WRB-314-25 and WRB-144-25) has been determined to be source material. This determination was made based on the type of material and concentration of Uranium present in the construction debris material and the nature of the historic operations involving the Uranium at the site.

The sample analysis, as detailed in Tables 4-1 through 4-5, indicates the presence of the following RCRA constituents: Barium, Naphthalene, 2-Methylnaphthalene, and bis(2-Ethylhexy)phthalate.

The Barium was reported at 0.4 mg/l and is less than the toxicity characteristic for Barium (100 mg/l) and as such is not considered hazardous under the D005 hazardous waste code.

Naphthalene was reported at 20 mg/kg. This material is not associated with any of the processes pertaining to F, P, and U hazardous waste codes.

2-Methlynaphthaline was reported at 17 mg/kg. There are no waste codes associated with this constituent.

Bis(2-Ethylhexyl)phthalate was reported at 24 mg/kg. This constituent is not associated with any of the processes pertaining to F, P, and U hazardous waste codes.

The analysis of the material in the fourth roll off, presented in Table 4-4, was non-detectable for TCLP Volatiles, PCBs, and Semi-volatiles. Barium was detected at 0.8 mg/l. This concentration is less than the toxicity characteristic for Barium (100 mg/l) and as such is not considered hazardous under the D005 hazardous waste code.

The clean debris was also evaluated for the presence/absence of radiological contamination. Field surveys were performed using a Ludlum beta/gamma meter (pancake meter) as the material was being removed from the trench and performing a walkover (measurements of the surface area of the material) using a Ludlum NaI detector and the Uranium analysis provided in Table 4-3.

Based on the analytical data and field surveys, the material in roll off number 4 was characterized as non-hazardous soil and debris.

4.5 Waste Transportation and Disposal

4.5.1 Radiological Debris Disposal

Better Management Corporation of Ohio, Inc. (BMC), coordinated waste transportation and disposal services under subcontract to Radian. All transportation services were performed in accordance with all applicable local, state and Federal regulations including US DOT specifications for Radioactive Material under Hazardous Materials Regulation (HMR) contained in 49 CFR Parts 171 through 180 and New York State NYCRR Part 381 regarding permitted transporters. Buffalo Fuel Corporation performed the actual transportation services. Buffalo Fuel is a NYCRR 381 permitted hauler for transportation to the end disposal facility.

Zhagrus Environmental, Inc. was responsible for coordinating and evaluating the waste characterization/hazardous determination of the material, preparing the Radiological Waste Profile Record for submittal to the accepting facility, inspection of containers prior to shipment, and preparing Uniform Low Level Waste Manifests for signature by the designated USACE representative.

Envirocare of Utah was the selected disposal facility for final disposition of the three roll off containers of building debris with residual radioactivity. Envirocare is a facility licensed to accept the building debris with residual radioactivity generated during the decontamination of the Bliss & Laughlin facility.

Copies of all Uniform Low Level Waste Manifests are provided as Attachment G.

4.5.2 Waste Debris

Wastes which are not characterized as radioactive, RCRA hazardous, or mixed wastes were transported by Buffalo Fuel to Waste Management, an appropriate permitted/licensed disposal

facility. The construction debris was transported in the 20-yard roll off (tarped). Waste shipment was under a Bill of Lading.

Copies of all Bills of Lading are provided as Attachment G.

4.6 Conclusions

Initial site surveys indicated elevated levels and activities of uranium on trusses and within the flooring, trenches and pit. Remediation activities included cleaning the trusses, scabbling of concrete and removal of contaminated debris in the trenches and pit. Radionuclide activities on surfaces were monitored during the remediation process, to help discern when remediation was adequate. The Final Status Survey (FSS) was conducted after remediation activities within the survey units had been completed. The results of the FSS identified that no remaining radiological surface activity was present above the cleanup level. The Final Status Survey Report is included as Attachment A.

For the FSS, a reference (background) survey was performed for each area of concern. Next, each of the survey units was scanned. Point readings were obtained for the concrete floors, trusses and trenches/pit. The point readings were compared to the clean-up level of 2000 dpm/100 cm^2 total activity. As shown in Table 4-6, none of the data (prior to subtracting out background levels) were above the clean-up level.

To confirm that soils met the soil cleanup level of 100 pCi/g of U-238, soil samples were collected within the trenches. Results from the isotopic analysis of these samples (Attachment H of the FSS Report) ranged from 1.2 pCi/g to 10 pCi/g. Therefore, no further remediation of the debris-filled trench in the Special Finishing Area was necessary.

The FSS measurements and sample locations, as well as information on measurement system MDC and measurement errors were documented in the Final Status Survey Report. As part of the FSS data assessment, a review of the survey unit data was conducted to ensure that an adequate number of data points were collected for each survey unit and ensure there was adequate power to detect Type II errors. If the actual standard deviation obtained in the Final Status Survey was greater than the estimated standard deviation used from characterization data, then the power of the test to detect a Type II error would not be adequate, and therefore the number of sample points would have to be increased. The standard deviation obtained in each survey unit (Attachments A-F of the FSS Report) was less than the estimated standard deviation (approximately 74 dpm/100 cm^2 for removable). Therefore, the power of the test was adequate and the number of data points was sufficient.

Since all the gross data (background plus residual surface activity in the survey units) were well below the clean-up levels, a statistical analysis using the Wilcoxon Rank Sum (WRS) test was not necessary. Because all of the data are below the clean-up level, the survey unit will meet the cleanup level and the application of the final statistical test is not required.

The results of the FSS are presented in Table 4-6 and indicate that each of the survey units has met the cleanup level and no additional remediation is required. As a result, the residual radioactivity at the Bliss & Laughlin site results in a dose well below the ARAR of 25 mrem/yr TEDE.

Table 4.6 Final Status Survey Results

Survey Unit	ROD Clean-up Level (dpm/100 cm^2)	FSS Mean Value (dpm/100 cm^2)	FSS Maximum Value (dpm/100 cm^2)
Concrete Floor	2,000	23.13	111.89
Truss Survey 98-073	2,000	26.22	97.9
Truss Survey 98-004	2,000	82.65	153.85
Truss Survey 98-005	2,000	154.72	293.71
Trench 01	2,000	43.03	111.89
Trench 02 Survey 98-046	2,000	66.16	181.82
Trench 02 Survey 98-049	2,000	73.93	209.79
Trench 02 Survey 98-049	2,000	94.99	251.75
Trench 02 Survey 98-071	2,000	47.95	83.92
Pit	2,000	18.10	69.93
Support Columns	2,000	88.22	181.82
Background Concrete	2,000	38.73	69.93
Background Trusses	2,000	46.26	83.92

This closure report demonstrates completion of all necessary remedial actions in accordance with the Record of Decision for the Bliss & Laughlin Facility. It also demonstrates compliance with CERCLA and the NCP in the conduct of response actions and completes the administrative record for the site.

5.0 REFERENCES

10 CFR (Code of Federal Regulations) 20: Standards for Protection Against Radiation.

Dames & Moore, 1999: Final Status Survey Report for the Bliss and Laughlin Site, Buffalo, New York. June 10.

Dames & Moore, 1999: Final Status Survey Plan for the Bliss & Laughlin Site. March 11.

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NUREG/CR-5849 ORAU-92/C57. Manual for Conducting Radiological Surveys in Support of License Termination. June 1992.

USACE, 1998: Cleanup Goals for Soil at the Finishing Area of the Former Bliss & Laughlin Facility. December.

USACE, 1998: Record of Decision for the Bliss & Laughlin Site. December.

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USAEC, 1974: Regulatory Guide 1.86, Termination of Operation Licenses for Nuclear Reactors. June.

USDOE, 1987: U.S. Department of Energy Guidelines for Residual Radioactive Material at Formerly Utilized Sites Remedial Action Program and a Remote Surplus Facilities Management Program Site. Revisions 2, Office of Nuclear Energy, March.

USDOE, 1990: Radiation Protection of the Public and the Environment. DOE Order 5400.5. Office of the Environment, Safety, and Health, February 8.

USDOE, 1992: Formerly Utilized Sites Remedial Action Program: Designation Summary for Bliss & Laughlin Steel Company, Buffalo, New York. Office of Environmental Restoration, August 4.

Declaration of Remedial Action Completion & Issuance of the Closure Report

The remedial action at the former Bliss and Laughlin Facility has been completed in accordance with the Record of Decision (ROD) signed December 11, 1998 and in compliance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan. As a result of the remedial action, no radioactive material remains on-site above the cleanup level established in the ROD and no further action will be required at the site.

BG Hans A. Van Winkle
Deputy Commander for Civil Works
20 Massachusetts Avenue, NW
Washington, DC 20314-1000

30 Sep 99
Date

This Attachment is not Available in Electronic Format
Contact Wendee Ryan to Request a Copy