

# Department of Energy

Portsmouth/Paducah Project Office 1017 Majestic Drive, Suite 200 Lexington, Kentucky 40513 (859) 219-4000

# APR 2 5 2014

PPPO-02-2239798-14

Mr. Todd Mullins Federal Facility Agreement Manager Division of Waste Management Kentucky Department for Environmental Protection 200 Fair Oaks Lane, 2<sup>nd</sup> Floor Frankfort, Kentucky 40601

Ms. Jennifer Tufts Federal Facility Agreement Manager U.S. Environmental Protection Agency, Region 4 61 Forsyth Street Atlanta, Georgia 30303

Dear Mr. Mullins and Ms. Tufts:

# REMOVAL ACTION REPORT FOR THE C-340 METALS REDUCTION PLANT AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX/07-1286&D2)

References:

- Letter from A. Webb to R. Blumenfeld, "Submittal of Comments to the Removal Action Report for the C-340 Metals Reduction Plant (DOE/LX/07-1286&D1)," dated March 11, 2014
- Letter from J. Richards to R. Blumenfeld, "EPA Comments on the Removal Action Report for the C-340 Metals Reduction Plant at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1286&D1)," dated February 26, 2014
- Letter from J. Woodard to T. Mullins and J. Tufts, "Removal Action Report for the C-340 Metals Reduction Plant at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1286&D1)," (PPPO-02-2035531-14), dated December 10, 2013

Enclosed for your approval is the D2 Removal Action Report for the C-340 Metals Reduction Plant at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1286&D2. This D2 document incorporates comments received from the U.S. Environmental Protection Agency on February 26, 2014, and the Kentucky Department for Environmental Protection on March 11, 2014. This secondary document satisfies the requirement for a removal completion report, as identified in the Removal Action Work Plan for the C-340 Complex Decommissioning at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0344&D2. This document follows guidance developed during the April 2010 Federal Facility Agreement (FFA) managers meeting regarding removal actions, and the contents are consistent with Section X.A of the FFA. Mobilization for this project occurred in August 2012, and final demobilization was completed in August 2013.

A redlined version of the document and comment response summaries also are provided to assist with your review.

If you have any questions or require additional information, please contact Rob Seifert at (270) 441-6823.

Sincerely, nufer Woodard

Jennifer/Woodard Federal Facility Manager Portsmouth/Paducah Project Office

Enclosures:

- 1. RACR for the C-340 Metals Reduction Plant, DOE/LX/07-1286&D2 (Clean)
- 2. RACR for the C-340 Metals Reduction Plant, DOE/LX/07-1286&D2 (Redline)
- 3. EPA Comment Response Summary
- 4. KDEP Comment Response Summary

e-copy/enclosures:

bradley.montgomery@lataky.com, LATA/Kevil brandy.mitchell@lataky.com, LATA/Kevil brian.begley@ky.gov, KDEP/Frankfort craig.jones@lataky.com, LATA/Kevil gave.brewer@ky.gov, KDEP/PAD jennifer.woodard@lex.doe.gov, PPPO/PAD kim.knerr@lex.doe.gov, PPPO/PAD latacorrespondence@lataky.com, LATA/Kevil leo.williamson@ky.gov, KDEP/Frankfort mark.duff@lataky.com, LATA/Kevil michael.kennicott@lataky.com, LATA/Kevil mike.guffey@ky.gov, KDEP/Frankfort myrna.redfield@lataky.com, LATA/Kevil pad.dmc@swiftstaley.com, SST/Kevil rachel.blumenfeld@lex.doe.gov, PPPO/PAD reinhard.knerr@lex.doe.gov, PPPO/PAD richards.jon@epamail.epa.gov, EPA/Atlanta rob.seifert@lex.doe.gov, PPPO/PAD stephaniec.brock@ky.gov, KYRHB/Frankfort todd.mullins@ky.gov, KDEP/Frankfort tracey.duncan@lex.doe.gov, P2S/PAD tufts.jennifer@epamail.epa.gov, EPA/Atlanta

# REMOVAL ACTION REPORT FOR THE C-340 METALS REDUCTION PLANT AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY

### **Description of the Removal Action Implemented**

The demolition of the C-340 Complex was warranted due to the contaminants of concern identified, their associated concentration levels and potential for release, and relevant process knowledge, as documented in the approved *Removal Action Work Plan for the C-340 Complex Decommissioning at the Paducah Gaseous Diffusion Plant*, DOE/LX/07-0344&D2 (RAWP) (DOE 2010a). The *Engineering Evaluation/Cost Analysis for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter at the Paducah Gaseous Diffusion Plant*, Paducah, Kentucky, DOE/LX/07-0131&D2/R1, is available online.<sup>1</sup> This document describes the processes and operations that occurred in the C-340 Complex and appropriate requirements (ARARs), and performance standards for this removal action. The Comprehensive Environmental Response, Compensation, and Liability Act non-time-critical removal action decommissioning activities described herein included the structural demolition of the C-340 facility; removal of certain low-hazard infrastructure (e.g., empty water, air, and nitrogen piping); and removal of residual waste materials.

This removal action meets the removal action objectives agreed upon among U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Kentucky Department for Environmental Protection (KDEP), as defined in the *Action Memorandum for the C-340 Metals Reduction Plant Complex and the C-746-A East End Smelter Non-Time-Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-0290&D2 (DOE 2010b). The removal action objectives are as follows:

- Reduce the potential exposure to on-site personnel from hazardous substances due to the structural deterioration of these facilities; and
- Reduce risks of releases to the environment and exposure to future industrial workers that may result from uncontrolled releases of hazardous substances, including radiological contamination, from these facilities.

Completion of this removal action supports the long-term remediation of the Paducah Gaseous Diffusion Plant. Demolishing the C-340 Complex structure has removed a source of a potential contaminant release to the environment. The demolition of the C-340 Complex addresses the substantive Resource Conservation and Recovery Act (RCRA) closure requirements for any areas where hazardous waste was discovered during deactivation, as summarized in DOE's letter, "American Recovery and Reinvestment Act Projects—Regulatory Process for Resource Conservation and Recovery Act Reporting and Closure of Areas Containing Newly Discovered Hazardous Waste," of October 6, 2009 (DOE 2009), which was approved by Kentucky on October 20, 2009 (KDEP 2009).

<sup>&</sup>lt;sup>1</sup> http://www.latakentucky.com/PublicDocuments/C-340%20Action%20Memo%20Addendum%20D2-A1,%20Nov%202011/

The associated solid waste management units (SWMUs) included in the RAWP for the C-340 Complex are listed in Table 1.

	C-340 Complex						
SWMU No.	SWMU Name						
101	C-340 Hydraulic System						
378	G-340-01 Generator Staging Area						
379	G-340-03 Generator Staging Area						
380	G-340-04 Generator Staging Area						
381	G-340-05 Generator Staging Area						
382	G-340-06 Generator Staging Area						
434	S-340-01 Satellite Accumulation Area						
477	C-340 Metals Plant						
514	C-340-D Reject Magnesium Fluoride Storage Silo						
515	C-340 "Dirty" Dust Collection System						
516	C-340 Derby Preparation Area Sludge Collection System						
521	C-340 Saw System Degreaser						
522	C-340 Work Pit Located at Ground Floor Level at B-7-B-9						
523	C-340 Metals Plant Pit Ground Floor at F-6 to F-11						
524	C-340 Pickling Sump B-10 and B-11						
529	C-340 Power Plant Sump at Ground Floor Level						

## Table 1. C-340 Complex SWMUs

The aboveground portions of the C-340 Hydraulic System, SWMUs 101 and 477, have been removed and disposed of. For SWMUs 378, 379, 380, 381, 382, and 434, all waste has been removed and these SWMUs no longer exist. SWMUs 514, 515, 516, and 521 have been completely removed and equipment disposed of and only the slabs remain. SWMUs 522, 523, 524, and 529 were backfilled with Portland cement concrete; the slabs were double washed and rinsed; and two contrasting colors of epoxy fixative were applied (DOE 2010a).

## Summary of Results

The demolition project involved removing the transite siding and demolishing the building structure, including any remaining piping and equipment on the slab and packaging it for disposal. Figure 1 is a photo of the C-340 Complex prior to demolition. Figure 2 shows the location of the facility. C-340 demolition did not involve removal of the slab, subslab penetrations, and/or foundations. Photos of the demolition of the C-340 progress are included in Appendix A. The slab was surveyed for radioactive materials, visually inspected for residual materials or staining, and sealed with a fixative. Pits were filled with Portland cement concrete.

Wastes were segregated, packaged, and dispositioned on-site at the C-746-U Landfill and off-site at Energy*Solutions* or Nevada National Security Site (NNSS). Very small quantities of waste generated during the removal action, such as used oil from equipment, maintenance, or unused chemicals, were dispositioned at Clean Harbors; Diversified Scientific Services, Inc. (DSSI); and East Tennessee Materials & Energy Corporation (M&EC). A total of approximately 35 ft<sup>3</sup> of waste was disposed of at these facilities. No equipment was identified that could be recycled or reused inside or outside of the DOE Complex.



Figure 1. C-340 Complex Prior to Demolition; View is from the Northeast Corner

# **Demolition**<sup>2</sup>

Transite removal began on August 22, 2012, and was completed on December 19, 2012. The actual structural demolition of the C-340 Complex was initiated on September 26, 2012, and was completed on February 12, 2013. All structural debris was packaged by March 27, 2013, and the application of slab sealant was completed by July 31, 2013. The demolition operations were completed in accordance with the D2 RAWP that had been approved by EPA on November 5, 2010. The Commonwealth of Kentucky had approved the D2 RAWP on November 4, 2010. Demolition activities were completed in accordance with PAD-PL-QM-001, *Quality Assurance Program Implementation Plan for the Paducah Environmental Remediation Project*, which can be accessed on the internet.<sup>3</sup>

During the activities that took place prior to beginning demolition, straw bales were placed along all storm water drainage ditches and around drainage grates. These storm water controls were consistent with the identified ARARs/to be considered guidance.

Dust suppression was used before, during, and after building demolition and also during waste packaging activities. Suppression methods included water misting with a DustBoss<sup>®</sup>, hand-held hoses for spot suppression, and the use of fixative. Prior to significant rainfall events, waste piles awaiting packaging were covered with Posi-Shell<sup>®</sup>, a clay-like spray-on product, to minimize potential for contaminated storm water runoff.

<sup>&</sup>lt;sup>2</sup> This section addresses the provisions of Section 2.3.5 of the RAWP.

<sup>&</sup>lt;sup>3</sup> http://www.latakentucky.com/PublicDocuments/C-340%20RAR%20D1,%202013-12/

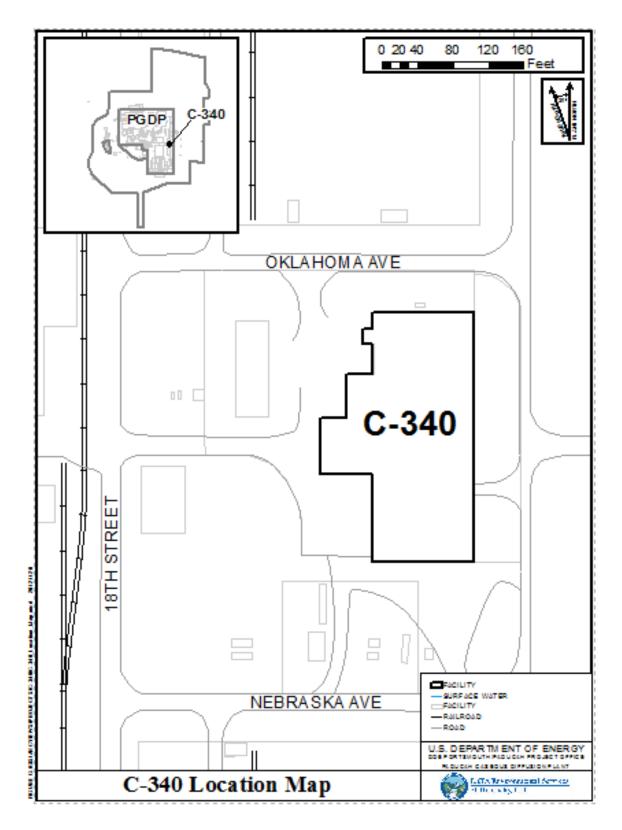


Figure 2. C-340 Complex Location Map

The demolition of the facility was accomplished using standard construction equipment, excavatormounted shears, and excavator-mounted grapples. Primarily, a special ultra-high-reach excavator was used for taller portions of the facility. Transite was removed using manlifts. Minor demolition was accomplished with plasma and oxy-acetylene cutting torches. Demolition of the structure included removal of infrastructure that was left in place after deactivation. Examples of the infrastructure included piping, stabilized ductwork, and deactivated equipment. This piping and equipment were removed and downsized prior to packaging for disposal.

The C-340 Complex demolition proceeded as follows:

- Initiated transite removal on shipping and receiving area;
- Demolished lunch room boundary control station on south end;
- Demolished the shipping and receiving area on the north end of the complex;
- Removed transite on the C-340-B Metals Plant during demolition of the boundary control station and shipping and receiving;
- Initiated demolition at the south end of C-340- B Metals Plant;
- Performed transite removal on north and west side of C-340-A Powder Building and C-340-C Slag unit during demolition of the C-340-B Metals Plant;
- Completed transite removal on remainder of C-340-A Powder Building and C-340-C Slag Unit;
- Demolished the C-340-C Slag Unit; and
- Demolished the C-340-A Powder Building.

During the demolition and removal of transite, asbestos-containing insulation that previously had been inaccessible was made accessible. Abatement of this asbestos was performed at this time, prior to proceeding with demolition.

# **<u>Slab Verification Survey and Surface Preparation</u><sup>4</sup>**

After the waste was removed, the slab was cleaned; all anchor bolts, piping, and metal framing was removed from the slab using cold cutting and hot work methods, such as metal cutting saws, reciprocating saws, and torches. Sumps and pits were cleaned out and backfilled with Portland cement concrete. Samples were collected from the bottom of the sumps.

The slab was inspected visually to identify any residual materials or staining. No residue or staining was observed. The slab was surveyed in accordance with the Demolition Verification Removal Action Plan to determine if there was residual radioactivity on the slab. This survey was performed following washing of the slab to prepare for epoxy application. Additionally, surveys were performed after application of the fixative to determine appropriate postings and control of the slab. The slab has been posted as a Fixed Contamination Area.

<sup>&</sup>lt;sup>4</sup> This section addresses the provisions of Section 2.3.7 of the RAWP.

Over 240 data points were collected during performance of the survey. As expected based on historical operations, fixed radiological contamination was found on the slab, with alpha contamination identified at levels up to 7,520 disintegrations per one hundred square centimeters (dpm/100 cm<sup>2</sup>), and beta/gamma contamination was identified at levels up to 1,150,000 dpm/100 cm<sup>2</sup> during surveys performed after cleaning of the slab, but prior to applying fixative. Very few of the survey data points indicated transferrable contamination above levels for posting as a Contamination area, and the application of the epoxy fixative sealed this contamination to the slab. The post-fixative surveys indicated no removable contamination and 1,000 dpm/100 cm<sup>2</sup> removable beta contamination. Based on post-fixative application surveys, the slab was posted as a Fixed Radiological Contamination Area. The radiological surveys are provided in Appendix B. Radiological surveys are performed in accordance with *Radiological Protection Program Description for LATA Environmental Services of Kentucky*, PAD-RAD-0101/R1AC1, which can be accessed on the internet.<sup>5</sup>

During deactivation of the facility, the slab, pits, and sumps floors were sealed with an application of Fiberlock ABC, a hydrocarbon-based fixative. Slab fixative was applied using airless sprayer equipment. Following demolition and final surveying, the slab underwent a double wash and rinse, followed by application of an epoxy-based sealant, Macropoxy 646-100, with Armorseal Rexthane top coat. The top coat of the sealant was applied in a contrasting color.

# Sump Verification Survey and Waste Water Disposal<sup>6</sup>

Figure 3 depicts the slab design/construction of the C-340 Complex. The sumps were cleaned out, and samples of the concrete from the pit walls were collected from pits on the C-340 Slab. Three samples and one duplicate were collected from the hydraulic ram pit (SWMU 522), one from the elevator pit, and one from the conveyor trench (SWMU 523). Additionally, a duplicate and a field blank were collected. These samples were analyzed for total polychlorinated biphenyl (PCB) and specific aroclors. Only Aroclor 1248 was detected in any of the samples. Results from the sampling are summarized in Table 2, and the data are provided in Appendix C. Data collection was performed in accordance with *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan*, DOE/LX/07-1269&D2/R1, which can be accessed on the internet.<sup>7</sup>

Sample Number	Location	Aroclor 1248 (mg/kg)	Total PCB (mg/kg)
340CONPIT-1	East Wall Near North End of Ram Pit (SWMU 522)	7.89	7.89
340CONPIT-1D (DUPLICATE)	East Wall Near North End of Ram Pit (SWMU 522)	16.9	16.9
340CONPIT-2	East Wall Middle of Ram Pit (SWMU 522)	305	305
340CONPIT-3	East Wall Near South End of Ram Pit (SWMU 522)	32.8	32.8
340CONPIT-4	Northeast Corner of small pit NE of Ram Pit	2.56	2.56
340CONPIT-5	East Wall of Elevator Shaft Pit	1.91	1.91
340CONPIT-6	West Wall of Conveyor Pit (SWMU 523)	3.6	3.6

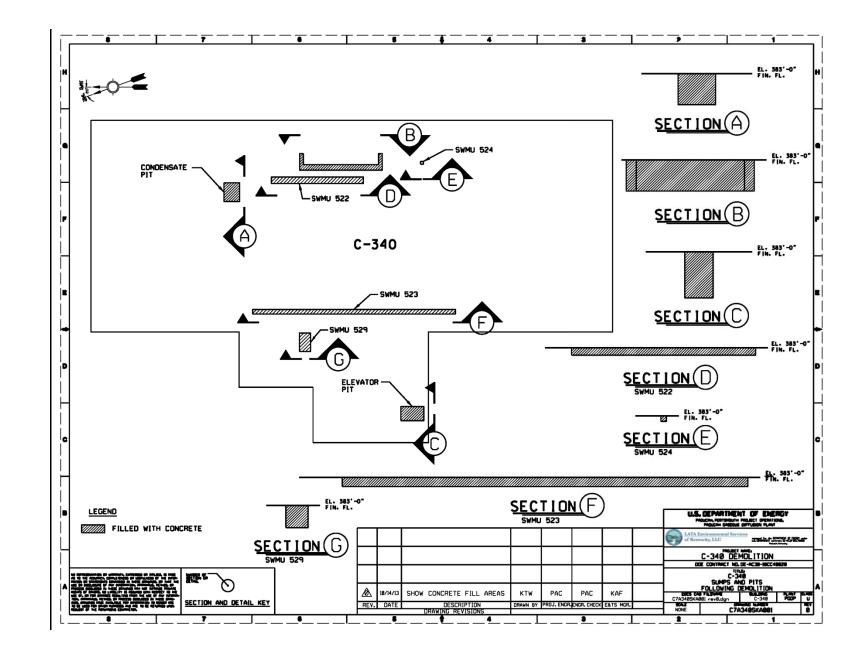
#### Table 2. PCB Sump Samples

Approximately 8,000 gal of water was removed from the sumps prior to backfilling with concrete. The water was sampled and analyzed for PCBs, metals, and radioactive contamination. The analytical results indicated presence of PCB greater than discharge limits. Based on these results, treatment of this water by

<sup>&</sup>lt;sup>5</sup> http://www.latakentucky.com/PublicDocuments/C-340%20RAR%20D1,%202013-12/

<sup>&</sup>lt;sup>6</sup> This section addresses the provisions of Section 2.3.7 of the RAWP.

<sup>&</sup>lt;sup>7</sup> http://www.latakentucky.com/PublicDocuments/Programmatic%20QAPP%20D2R1,%202013-02/





carbon absorption and filtering to remove suspended radionuclides was completed. The water was sampled following treatment; analyzed; and, based on the analysis, was discharged in accordance with ARARs. No residues or stained areas were observed on the walls and floors of the sumps following the removal of the water.

Approximately 7,800 gal of decontamination waste water was generated during this project. This water was characterized, and treatment is complete. The decontamination waste water was treated by carbon absorption, followed by pH adjustment, precipitation, and filtering to reduce dissolved radionuclide levels. Following treatment, this water was sampled, analyzed, and discharged in accordance with ARARs. Treatment and discharge of all waste water was completed on September 24, 2013.

# Waste Segregation, Packaging, and Disposal<sup>8</sup>

Implementation of the removal action generated 118,034 ft<sup>3</sup> of demolition debris, not including wastewater. The demolition material was segregated into two primary waste streams. The demolition generated 64,028 ft<sup>3</sup> of debris that met the waste acceptance criteria and was disposed in the on-site C-746-U Landfill. Disposal of this waste stream, which included the transite removed from the building exterior, was completed in July 2013. During routine sampling at the C-746-U Landfill in the spring of 2013, uranium concentrations in leachate and surface water from the landfill indicated uranium levels had increased above those levels generally observed at the landfill. The radionuclide levels observed were in compliance with DOE Order 458.1. This increase was observed in the months after the placement of waste from the C-340 demolition project into the landfill. DOE continued to monitor these results and has observed an overall decrease in uranium levels. DOE continues to actively implement its environmental monitoring program, which includes surface water, leachate, and effluent sampling. The sampling results are included in Kentucky Pollutant Discharge Elimination System monitoring reports and landfill reporting.

Demolition resulted in generation of 53,414 ft<sup>3</sup> of PCB remediation low-level waste (LLW) waste at levels of PCBs above 50 ppm that was disposed of at Energy*Solutions*. This waste included 51,800 ft<sup>3</sup> that was shipped in 28 railcars on July 18, 2013. In addition to the gondola shipments, 1,614 ft<sup>3</sup> of material in intermodals and other containers of PCB remediation waste were shipped to Energy*Solutions*; the final shipment of this material occurred on September 23, 2013.

The demolition generated 456 ft<sup>3</sup> of LLW that required disposition at the NNSS, based on levels of depleted uranium. The final shipment of this material occurred on September 30, 2013.

Approximately 136 ft<sup>3</sup> of mixed waste or hazardous waste was generated during the removal action. This material was dispositioned at Energy*Solutions*, DSSI, M&EC, or Clean Harbors. The final shipment of this material occurred on September 23, 2013.

# **Contamination Control**

During the performance of the C-340 demolition, activities that had the potential to involve radioactive materials or radioactive contamination were conducted in accordance with the LATA Environmental Services of Kentucky, LLC, Radiation Protection Program, PAD-PLA-HS-002/R2. This document outlines the requirements necessary to ensure compliance with applicable federal laws and DOE Orders. Routine radiological surveys were performed on predetermined schedules by the radiation protection staff. Additional samples were obtained before, during, and following the completion of work that could impact radiation/contamination levels.

<sup>&</sup>lt;sup>8</sup> This section addresses the provisions of Section 2.3.6 and Section 2.3.4 of the RAWP.

Radiological surveys included exposure rate measurements from the following locations: (1) from the general area; (2) at 30 cm from a source or surface of interest; and (3) on contact with potential sources of radiation where hands-on work was occurring. Radiological surveys also were performed in and adjacent to potentially contaminated areas to evaluate contamination levels and identify any spread of contamination beyond established boundaries.

There were no personnel contamination events during D&D of the C-340 Complex. During high-reach demolition operations, small pieces of dried fixative and paint were being dislodged from the elevated areas of the C-340 Complex. This lightweight debris was being blown from the upper floors of the building due to wind gusts and was found outside the Contamination Area encompassing the demolition site. Contamination measurements determined that the dried, fixative debris did not possess radioactivity in excess of 10 *CFR* § 835 limits, while the heavier dried paint debris did. Individual pieces of contaminated dried paint debris were found to be less than 100 cm<sup>2</sup> in area. Radioactivity on the paint debris was measured up to maximum result of 26,000 dpm beta/gamma and 59 dpm alpha. No detectable removable contamination was detected on the debris. Paint chips were retrieved and dispositioned with demolition debris.

During high-reach demolition operations of the 7th floor of C-340, small pieces of contaminated insulation and contaminated water overspray were blown onto the roadway north of the C-340 Facility. The roadway is outside the Contamination Area that surrounds the demolition site. Initial surveys of vehicles and roadway in the impacted area indicated the presence of removable contamination in excess of 10 CFR § 835 limits. It is suspected that water used for dust suppression became contaminated after contacting uranium residue within a duct and was blown into the northern buffer area by gusting winds. The residue and insulation were not accessible prior to demolition. Small pieces of insulation also were retrieved from the C-531 Switchyard, located north of the C-340 Complex. Removable radioactivity on the roadway (Oklahoma Avenue) was measured up to a maximum result of 8,600 dpm/100 cm<sup>2</sup> beta/gamma and 1,300 dpm/100 cm<sup>2</sup> alpha. Removable radioactivity on the vehicles parked on the C-340 Facility entrance and roadway was measured up to a maximum result of 3,700 dpm/100 cm<sup>2</sup> beta/gamma and 1,200 dpm/100 cm<sup>2</sup> alpha. The roadway previously had been posted as a Radioactive Materials Area/Fixed Contamination Area due to contaminated windborne paint flakes that were found in this area. Vehicles were decontaminated using household cleaners (e.g., Simple Green, 409) and wipes; then the vehicles were surveyed and free released in accordance with 10 CFR § 835 limits. The roadways, which previously were posted as fixed contamination areas due to historical contamination, were surveyed to verify no remaining loose contamination was present, they were returned to fixed contamination status.

During downsizing of a heater box located in the C-340-B Building on December 12, 2012, the shear cut into the box and encountered a layer of asbestos insulation hidden behind firebrick in the heater. Dust became airborne and overwhelmed the misting dust suppression system and exited the Contamination Area boundary, which was posted along the facility's eastern fence. The dust continued east-northeast across equipment that was located immediately adjacent to the fence and ultimately dispersed. The dust left a white residue on the adjacent equipment (i.e., generators, utility trailer, fire extinguishers, and ladder). Work was stopped, and the area impacted by the asbestos was cleaned up, with resulting material packaged as asbestos-containing waste. The equipment involved was decontaminated. The heater box was dispositioned without further downsizing as asbestos waste. Work activities were redirected during the cleanup and decontamination of equipment due to the presence of the asbestos in the heater box. No workers were in the area immediately downwind of the dust, and the operator downsizing the material was inside an enclosed cab excavator and was wearing disposable anticontamination coveralls with a respirator. An initial assessment by surveying the generator in the area measured removable contamination at 250 dpm/100 cm<sup>2</sup> transferable alpha and 915 dpm/100 cm<sup>2</sup> transferable beta/gamma that

exceeded Appendix D of *CFR* § 835 limits for removable contamination. The area was posted as a contamination area until decontamination of the equipment and area was completed to release levels. The postings then were removed.

Following this discovery of the hidden asbestos layer, other similar heating equipment in the C-340 Complex was evaluated for the potential for hidden layers of asbestos. A set of clamshell heaters located on the sixth and seventh floors of the C-340-A Powder Building was identified that contained similar nonasbestos firebrick. Samples were collected from behind the firebrick in the heaters, and a concealed, underlying asbestos material was identified. Demolition was deferred in this area to allow abatement of the asbestos-containing material in these clamshell heaters.

Material and equipment released from radiological areas to controlled areas, or for unrestricted release, were monitored by radiological control personnel. No vehicles, heavy equipment, tools, or equipment were removed from the C-340 area without written certification that the equipment had undergone a radiological survey and had met the appropriate release criteria.

# Area Air Monitoring

Over 3,700 discrete air samples were collected for radiological contamination, asbestos, and metals during the demolition. These samples comprised of breathing zone personnel monitoring samples for workers, area monitors, perimeter monitors, and clearance samples. Of these 3,700 samples, a total of 8 breathing zone samples exceeded the DOE Occupational limit for radiological contamination that triggers use of respiratory protection. The workers for which these samples were collected were using the appropriate protection. A total of 1,651 breathing zone samples was collected. Additionally, 373 perimeter or area monitoring samples were collected for radiological contamination. None of the area or perimeter samples were collected using solar powered samplers, running continuously, with samples nominally collected twice weekly.

None of the 20 area samples collected for metals or the 5 personnel monitoring samples collected for metals exceeded the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs). A total of 1,386 perimeter samples was collected for asbestos during all phases of the removal action. Three asbestos perimeter asbestos samples that reported at .01009 fibers per cm<sup>3</sup> (f/cc) of air during lead bolt cutting for transite removal; 0.01391 f/cc during transite removal and building demolition; and 0.01024 f/cc during building demolition and material downsizing.

These were compared to an administrative control level for asbestos perimeter sampling of 0.01 fibers per cm<sup>3</sup>. Since these samples were at or slightly above the administrative control level and were only 3 samples from a total of 1,386 perimeter samples, changes were not made to work practices or dust control measures based on these 3 samples. A total of 292 breathing zone asbestos samples was collected during the transite removal and asbestos abatement activities. One sample of these exceeded the OSHA PEL. This sample was a personnel monitoring sample collected during demolition by the demolition subcontractor of an asbestos containment, which was reported at 1.89 f/cc, versus an occupational limit of 0.07 f/cc based on a 10 hour work day. The subcontractor employee was wearing disposable anticontamination coveralls and a full-face, powered, air purifying respirator during the containment demolition. The protection factor of the respiratory equipment was not exceeded. Corrective actions, including changing approach for asbestos abatement and providing additional oversight of subcontractor asbestos activities, were implemented as a corrective action following the event that produced this sample. Required clearance samples were performed in accordance with ARARs, including 401 *KAR* 58:040 4(2)(c). All clearance monitoring results met the applicable standards for successful abatement as defined in the ARARs. Data summaries for the air monitoring are provided in Appendix D.

### **Summary of Problems Encountered**

No significant problems were encountered during implementation of the RAWP. Minor issues encountered during the demolition included the release of paint chips, fixative, and contaminated insulation outside the demolition area, as well as the discovery of hidden asbestos in the heater boxes and clam shells. Additional detail on these deviations is included in the section entitled, "Contamination Control."

Additionally, the following specific items were identified that were minor deviations from the RAWP. None of these deviations impacted the implementation of the removal action or compliance with ARARs.

- (1) RAWP, Section 2.3.6.1, included an expectation that the majority of waste would be LLW and asbestos-containing material. Characterization indicated, however, that nearly 50% of generated demolition debris was LLW PCB remediation waste, with concentrations greater than 50 ppm PCB. The PCB Remediation Waste disposition was completed in accordance with ARARs.
- (2) Following completion of demolition and removal of waste, several failures in the building slab were identified that were not present prior to structural demolition. These included holes or damaged areas of concrete that, in a few cases, extended through the slab into the backfill below. To ensure a good bond between the slab and the epoxy fixative, forms were installed and concrete was poured to fill holes. The RAWP did not address potential repairs to the slab following demolition, however, the repairs were necessary to ensure the epoxy coating would adhere, and the repairs did not impact the removal actions' compliance with ARARs.
- (3) The sequence of work defined in the Demolition Plan in the RAWP (Appendix A) included filling of pits with flowable fill prior to structural demolition. The field sequence for work was adjusted, resulting in the filling of pits after demolition was partially completed. This sequencing did not impact compliance with ARARs.

#### Summary of Accomplishments and/or Effectiveness of the Removal Action

The demolition of the C-340 Facility was accomplished in accordance with the D2 RAWP (DOE 2010a). Waste handling, segregation, packaging, shipping, and disposal were accomplished in accordance with ARARs.

#### **Timeline for Completion**

Table 3 illustrates the timeline for the D&D phase of the C-340 demolition program. The demolition was initiated on September 26, 2012.

Date	Activity
8/22/2012	Initiate Transite Removal
9/26/2012	Begin Demo of C-340 B and Lunch Room
10/3/2012	Begin Demo of Shipping and Receiving
10/4/2012	Completed Demo of Shipping and Receiving
10/8/2012	Begin Demo of MgF <sub>2</sub> Tank
10/9/2012	Completed Demo of MgF <sub>2</sub> Tank
12/19/2012	Complete Transite Removal
10/24/2012	Completed MgF <sub>2</sub> Tank disposal
10/30/2012	Completed Waste Disposal from Shipping and Receiving and Lunch Room
11/14/2012	Begin C-340-B Building Demo
12/7/2012	Begin C-340-B Building Demo
1/4/2013	Begin C-340-C Slag Unit Demo
1/22/2013	Begin C-340-A Building Demo
1/3/2013	Completed C-340-B Building Demo
1/4/2013	Completed C-340-C Slag Unit Demo
2/12/2013	Completed C-340-A Building Demo
2/28/2013	Completed Backfilling of Sumps
7/25/2013	Completed Applying Sealant to Slab
9/30/2013	Completed Shipment of Demolition Debris for Off-site Waste Disposal
8/1/2013	Completed Waste Disposal at C-746-U Landfill
9/24/2013	Completed Treatment and Discharge of Decontamination Water and Water from Sumps

# Table 3. Timeline of Demolition of C-340 Complex

## Summary of Any Operation and Maintenance Required

Routine inspection of fixative on slabs and repair as necessary is only operation and maintenance required.

## **Summary of the Project Cost**

The cost of implementing this removal action project, including packaging, transportation, and disposal of demolition debris, was \$20.2 million. Table 4 summarizes the cost elements.

#### **Table 4. Summary of Cost Elements**

Activity	Cost, \$M
Demolition of Structure, Project Management, Slab Preparation,	
and Sealing, Site Restoration	13.5
Structural Waste Packaging, Transportation, and Disposal	6.7
Total	\$20.2

#### **References**

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# APPENDIX A

# **PHOTOGRAPHS OF C-340 DEMOLITION OPERATIONS**

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Figure A.1. C-340 Complex Prior to Demolition



Figure A.2. A Man-lift Is Used to Reach Fixative-sprayed Transite Panels



Figure A.3. Workers Stack Removed Transite on Plastic Sheeting



Figure A.4. Workers Wrap Stacked Transite for Disposition



Figure A.5. Double-wrapped Stack of Transite Panels Are Moved to Loading Area



Figure A.6. Double-wrapped Stacks of Transite Panels Are Loaded on Truck for Transport



Figure A.7. Debris from the Lunch Room Is Loaded into Trucks for Transport to the C-746-U Landfill (Trucks are lined with plastic and waste is covered before leaving the area.)



Figure A.8. Excavators with Shear Attachments Are Used To Remove Parts of the Building and Debris Generated by Demolition Activities



Figure A.9. Two Excavators Downsize a Beam from the C-340-B Metals Plant Building (Debris from this building loaded in gondolas for off-site shipment.)



Figure A.10. Excavators Load Debris from the C-340-B Building into Roll-off Bins in Background (Loaded bins are transported to the railcar loading area for transfer into gondolas for off-site shipment. Bins are plastic-lined and waste is covered when leaving the area.)



Figure A.11. An Ultra-high-reach Demolition Machine Is Used To Remove Parts of the Building That Can't Be Reached by the Smaller Excavators



Figure A.12. An Ultra-high-reach Demolition Machine Is Used to Demolish the Metals Plant from the Top Down



Figure A.13. The Support Beams for the Metals Plant Are Cut To Bring the Building to Slab



Figure A.14. Debris Being Processed Following Demolition (Debris segregated from different parts of building by sequencing demolition; separate debris piles maintained for landfill disposal and off-site shipment.)



Figure A.15. C-340 Complex after Demolition

**APPENDIX B** 

**RADIATION SURVEY RESULTS** 

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**PRE-FIXATIVE SURVEY RESULTS** 

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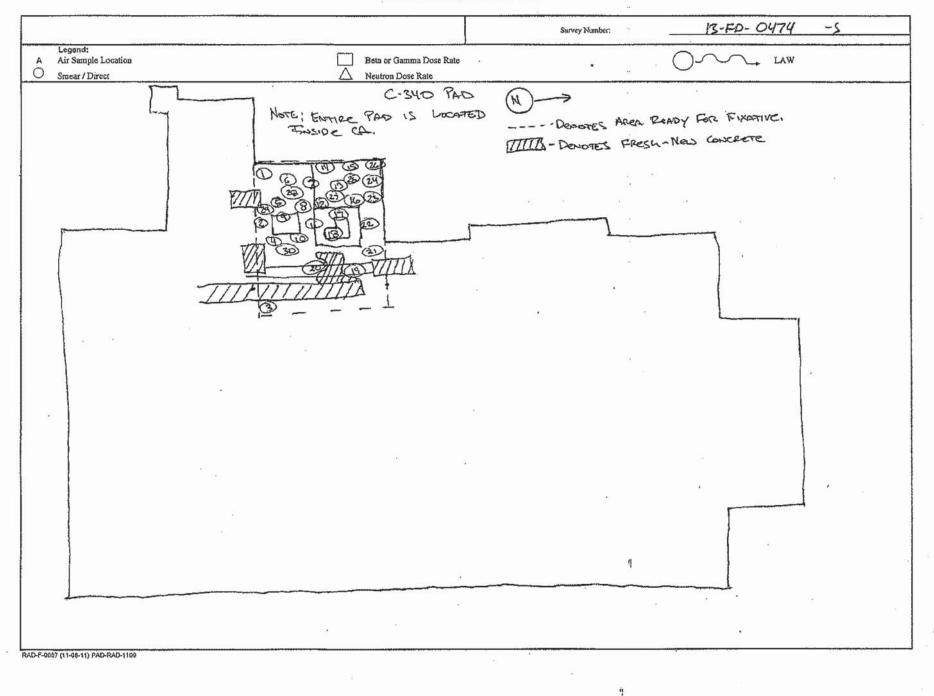
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/	skgd (mrem/hr)			4 Serie! # LLD (mrem/hr):		Cal Due			BCF:		ŝ
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nments/R	eference Surveys/Relea	used To (as applicab	le):								
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r:	NA	J	N/1	Badge	HVY	RCT:	MA		NUA	Badge;	NIA

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		tal α 100cm2		vable a		al β/γ 100cm2		oble B/y		Vable a LAW	Remove cpm.l		$S_{i}$						
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2	18	178	٩	24	187	4,041	-22-77	63											
3	37	370	1	2	2465	77,096	59	44											
ч	17	168	2	5	285	7,184	67	37											
5	20	198	5	13	141	2,566	63	an											
6	NA	NA	3	8	NA	NA	63			<u> </u>				•					
7			١.	2			43			ļ									
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9	1		5	13	1×		53	2rc		ļ									
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12	5	47	10	27	2,133	60,449	94	108		<u> </u>									
13	22	219	4	10	249	6,029	67	37											
14	9	87	3	8	220	5099	62	42x					· ·						
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16	NA	NIA	3	8	NIO	NA	42	+											
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18			3	8			62	<u> </u>											
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24	26	97	5	13	182	27,580	88	92		14 -	NY	Ψ	SEE	Amach	es mo			RC	·

Comments: Norts: SURVEY was PERFORMED PRICE TO ANY FIXATIVE Application. De

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RAD-F-0008 (11-05-11) PAD-RAD-1109

NOTE: Any response of the instrument that is 2 Lc is considered to be above background.

	Survey Nu	nibert	Y	3-PD-	-04	2-5	>							Page _	3Q	_	
Instrument	Tot	al α 00cm2 0.4	dpm/J bkg(cpm)	vable oz 00cm2	dpm/] bkg(cpm)	d β/γ 60cm2			Remov cpm/ bkg(cpm)		Remove cpm// bkg(cpm)	LAW					
Item No.	<u>Lc</u> ≡ gross cpm	dpm 100cm2	Lc≡ gross cpm	dpm 100cm2	Le= gross epm	dpm 100cm2	<u>Lon</u> gross cpm	dpm 100cm2	Le= N LA cpm/	Νa	LAW	<u>ν β</u> η LAW			Sample Location and/or remarks	RC1 Initia	
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RAD-F-0008 (11-08-11) PAD-RAD-1109

NOTE: Any response of the instrument that Is ≥ Lc is considered to be above background,

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RADIOLOGICAL SURVEY MAP FORM

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		Survey Number:	13-EP-0492-S	
nd:ample Location r / Direct	Beta or Gamma Dose Rate	· · ·		
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			21.1.12.1	R	ADIOLOGICA	L SURVEY COVER	RFORM			
Survey No	D:	13-FD-	505-9				Page	1	of	84
Complete	d Date:	6/3/13		Completed Time:	1515	RWP Number	^	29448 reno		04 8×13
Location (	of Survey-Gen	cral (Site/Bldg.):	C-34	0	Spe	cific (Room/Area/Item):	Coucrete	pad in conta	Tarelow	ANA WA
		n - met - constant - cos - €ur :	~		~			-	1	10 1.100
Material /	Other Job Des	cription:	TIC +	DAINT SURVEY	/ OT f	nid-South	Section.	at concrete p	Ad	
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	Water and the second		College or considered	and the second second second second second		ment Information				
SHOREFORM	Inst. Model #	Lud	12_	Serial #	264687	ation / Field Instruments Cal Due	9/30/13	Probe Model	43-5	
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	Inst. Model #			Scrial#	J <del></del>	Cal Due		Probe Model		
4 6	Bkgd (cpm): Inst. L. (cpm)			MDC Pt (dpm) P		MDC Pl (dpm) CF Pl:	AA		5	
P COMPANY			ale and a state of the	CFRE	Laborato	ry/SmearInstruments	entra de la companya		A 2/2/1	
	last. Model #	Lid	2929	Scrial #	261408	Cal Due	11/30/13	Probe Model	-43-107	43-10-1
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	β Bkgd (cpm):	<u>4 (</u>	S Save and the state of the	β MDC (dpm)		β Inst. 1, (cpm)	59	β CF PI:	2.64	Cardia Andreas International
	Inst, Model #			Serial #	2-23-2007-21202-0020	Cal Due		Probe Model		
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7	Model # Bkgd (mræz/l			Serial # LLD (mrem/hr);		Cal Due		- BCP		
		Sector A	en versen geb	No. of Concession, Name	The second second					
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-8-	Bkgd (mrem/	br)		LLD (mrem/br);						
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	y Results Attac				5 ( <u>11</u> 1)	Yes No		1		
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4 <sup>2</sup>		N	1							Δ
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Survey Number: 13-FD-505 - S

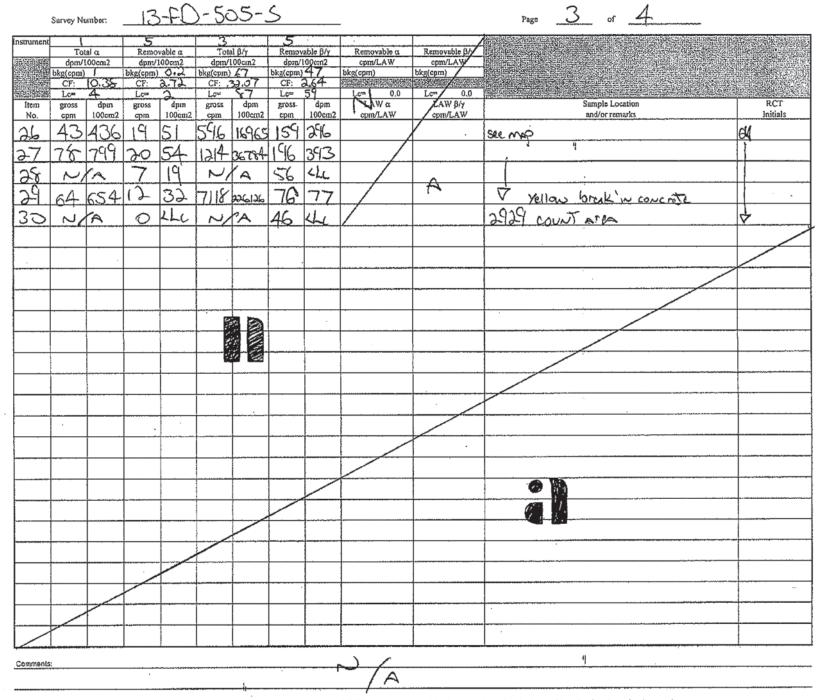
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18	47	478	4	10	4768	15140	3 86	103		•			
19	NA	NA	1.5	40	NA	NA	1112	172					
20	20	197	16	43	13.4	7366	495	127				break /lousing	
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Comments:

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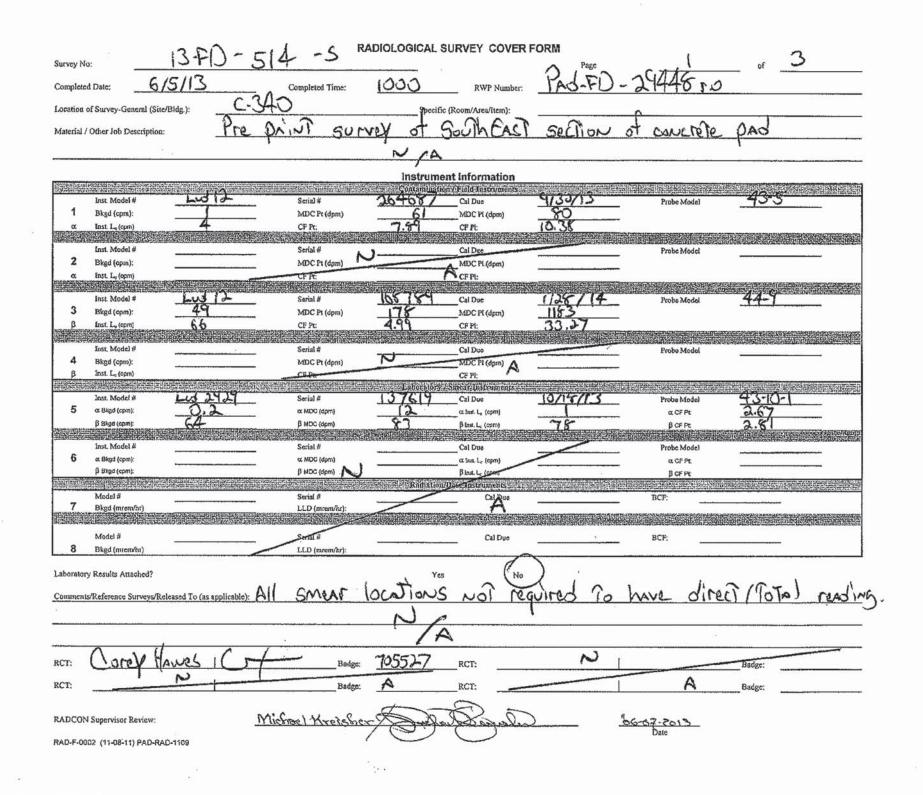
RADIOLOGICAL SURVEY MAP FORM

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Page

	4 2	Survey Number:	13-FD-505-5
Legend: A Air Sample Location Smear / Direct	Beta or Gamma Dose Rate		Orra LAW
Seam in concrete	* **	<b>4</b> . : . :	<u>C-340 PAD</u>
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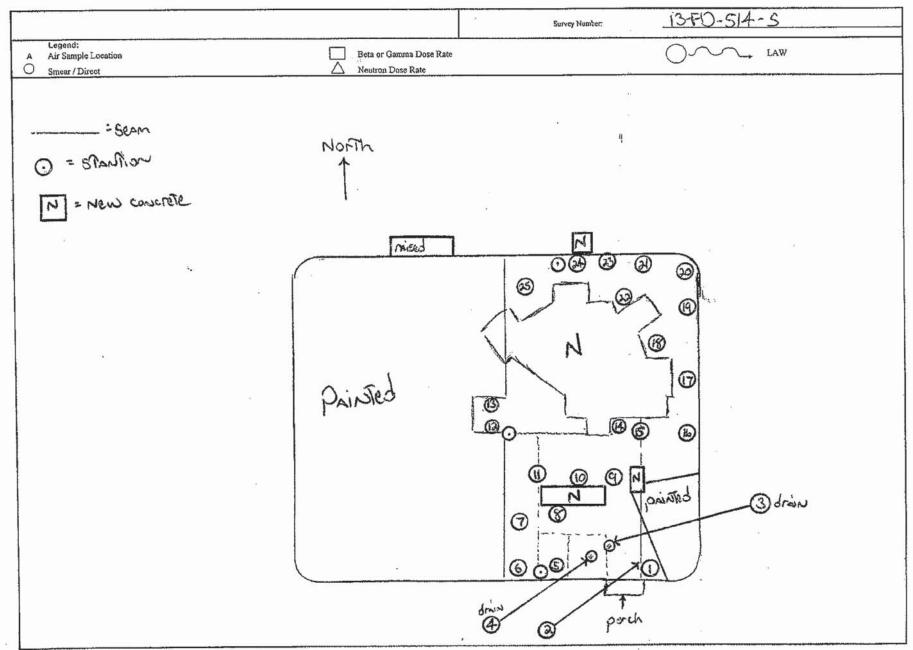
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Survey Number:	101.0					ſ	rage		and the second second	
Total a	Removable dpm/100cm	12 dpm/10	β/γ Remo	vable β/γ /100cm2	Removable α cpm/LAW	Removable 3/y/ cpm/LAW				
bkg(cpm)   CF: 10.35	6kg(cpm) 0.) CF: 3.6	bkg(cpm)	bkg(cpn	164	State Manager State	bkg(cpm)				
Item gross dpm		pm gross	dpm gross	dpm	LAWK	Lc= 00 LAW $\beta/\gamma$		Sample Location		CT itials
No. cpm 100cm	2 cpm 100	em2 cpm	100cm <sup>2</sup> cpin	100cm2	Andrew	CPM/LAW	ser ma	and/or remarks	6Å	uws
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3 38 384	133	1	116279 98	96				drain		
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	38	S N/	<u>a 53</u>					at the t		
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RAD-F-0008 (11-08-11) PAD-RAD-1109

RADIOLOGICAL SURVEY MAP FORM

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Page



RAD-F-0007 (11-08-11) PAD-RAD-1108

Survey Nor 154D-533 -5 Completed Date: 61/1/3 Completed Time: 1310 RWP Number: 120-121448 rev. 0 Contaction of Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Otor Job Development: 1210 Survey Control (Studie), C-340 Naterial / Survey Control (Studie), C-34	Survey No:	3.FD	533	S RADI	OLOGICAL S	URVÉY COVE		. 1	-	2	
Laxino of Survey General (SlavBildg): Meterial / Other <i>Inb</i> Decorption:							O I TO	20175		<u></u>	
Maerial / Other Job Description: Press Note: Press Not:	Completed D	Date: 6/1/12		mpleted Time:	1310	RWP Number		)- 2-14-40 rev.	0		
NA     Instrument Information       Instrument Information </td <td>Location of S</td> <td>Survey-General (Site/Bldg.):</td> <td><u>C-340</u></td> <td></td> <td>the second s</td> <td></td> <td>Concrate</td> <td>Pad</td> <td></td> <td></td>	Location of S	Survey-General (Site/Bldg.):	<u>C-340</u>		the second s		Concrate	Pad			
NA     Instrument Information       Instrument Information </td <td>Material / Oti</td> <td>ther Job Description:</td> <td>fre Dain</td> <td>is surve</td> <td>y of N</td> <td>Jorth Er</td> <td>ed of co</td> <td>NCREDE DAY</td> <td></td> <td></td>	Material / Oti	ther Job Description:	fre Dain	is surve	y of N	Jorth Er	ed of co	NCREDE DAY			
Instrument Information         Instrument Information         a       Instrument Information         bat Model #       Section #         a       Instrument Information         bat Model #       Section #         a       Instrument Information         Instrument Information <td colsp<="" td=""><td></td><td></td><td>3</td><td>٨</td><td></td><td></td><td></td><td>Long to</td><td></td><td></td></td>	<td></td> <td></td> <td>3</td> <td>٨</td> <td></td> <td></td> <td></td> <td>Long to</td> <td></td> <td></td>			3	٨				Long to		
Contamination / Fold Instruments         Contamination / Fold Instruments         1       Based of Instruments         2       Based of Instruments         2       Seriel #       Control       Contre       Contre <td></td> <td></td> <td></td> <td></td> <td></td> <td>nt Information</td> <td></td> <td>***************************************</td> <td></td> <td><u></u></td>						nt Information		***************************************		<u></u>	
1       Bigl (spin):       Q.4       MDC P (dpin)       TGB       DC P (dpin)       TGB         2       Bigl (spin):       CP ii.       GC P ii.       GC P ii.       GC P ii.       GC P ii.         3       Bigl (spin):       Seriel #       Seriel #       GC P ii.       GC P ii.       Feets Model         4       Bigl (spin):       Seriel #       GC P ii.       GC P ii.       Feets Model       Feets Model         3       Bigl (spin):       Seriel #       GC P ii.       GC P ii.       GC P ii.       Feets Model       Feets Model         4       Bigl (spin):       Seriel #       GC P ii.       GC P ii.       GC P ii.       Feets Model       Feets M					Contaminatio	n / Field Instrument			A7.5		
Inst. Model #       Seriel #       MCC PLOBEN N       CLD us       Probe Model         2       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model         3       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model         3       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model       44-51         3       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model       44-51         4       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model       44-51         5       Inst. Model #       MCC PLOBEN N       CLD us       Probe Model       44-51         5       Inst. Model #       MCC PLOBEN N       CLD us       Probe Model       44-51         6       Bigl Gents:       MCC PLOBEN N       CLD us       Probe Model       42-10-1         5       Inst. Model #       Lid JSI NP       Seriel #       CLD us       Probe Model       42-10-1         6       Bigl Gents:       Lid JSI NP       Seriel #       CLD us       Direct Model       32-10-1       Scriet #         7       Bigl Gents:       Lid JSI NP       Seriel #       CLD us       BCF:       Scriet #       Scriet #         8       <		A					61	Probe Modei	43-5		
2       Bigs (cpn);       MIC Pr (dpn) N       MIC Pr (dpn) A         3       Bigs (cpn);       MIC Pr (dpn) N       MIC Pr (dpn) A       Probe Model       44-9         3       Bigs (cpn);       MIC Pr (dpn) N       Cal Doe       MIC Pr (dpn) A       Probe Model       44-9         4       Bigs (cpn);       MIC Pr (dpn) A       Cal Doe       MIC Pr (dpn) A       Probe Model       44-9         4       Bigs (cpn);       MIC Pr (dpn) A       Cal Doe       MIC Pr (dpn) A       Probe Model       44-9         5       Bigs (cpn);       MIC Pr (dpn) A       Cal Doe       MIC Pr (dpn) A       Probe Model       42-10-1         6       Bigs (cpn);       MIC Pr (dpn) A       Cal Doe       MIC Pr (dpn) A       Probe Model       42-10-1         5       Inst. Model #       Lido Sty St       Serial #       Cal Doe       11/30/12       Probe Model       42-10-1         6       Bigs (con);       24       Serial #       Cal Doe       11/30/12       Probe Model       42-10-1         6       Bigs (con);       24       Serial #       Cal Doe       Bigs (con);       24-10-1       11/30/12       11/30/12       11/30/12       11/30/12       11/30/12       11/30/12       11/30/12       11/30/12<	α Ins	st. L. (cpm)		CF Pt:		CF PI:	10:12		naar waxeen van eense work in	-orae 1980aaaaaaa	
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3       Bigd (cpm);       MOC P (dpm)       MIC P (dpm)       MIC P (dpm)         9       Inst. Model #       Secial #       CA Date       Probe Model         4       Bigd (cpm);       MOC P (dpm)       CA Date       Probe Model         9       Inst. Model #       Secial #       MOC P (dpm)       Probe Model         9       Inst. Model #       MOC P (dpm)       CA Date       Probe Model         9       Inst. Model #       Laboratory / Smeet Instruments       Probe Model       43-(O-1)         9       Inst. Logent       CA Date       Secial #       Attract (cpm)       Secial #         9       Inst. Model #       Laboratory / Smeet Instruments       Probe Model       43-(O-1)         9       Bigge (cpm):       Attract (cpm)       Secial #       Cal Date       Secial #         10       Bigge (cpm):       Batel (cpm)       Secial #       Cal Date       Bore Pre       Acta         11       Bigge (cpm):       Batel (cpm)       Bigge (cpm)	α in	SL. L <sub>e</sub> (Cpm)									
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β Bigd (com):       β MOD (com)       β Lut. (com)       β CF Pc         Model #       Serial #       Cal Due       BCF:         Laboratory Results Attached?       (This Stell new dr)       Yes       No         Comments/Reference Surveys/Released To (as applicable):       PAJ PAJ PAS been Cleaned + is ready To be pAlsTed.       Nadge:         RCT:       Orrey Haues       Cal Budge:       No       No         RCT:       N/A       Badge:       N/A       Badge:         RCT:       N/A       Badge:       N/A       Badge:       Badge:         RCT:       N/A       Badge:       N/A       Badge:       Badge:         RCT:       N/A       Badge:       N/A       Badge:       Date         RADCON Supervisor Review:       Michael Kreischer       Schell Review       Cal Polla       Date <td>Ins</td> <td>st. Model #</td> <td></td> <td></td> <td>Articular (1006) 2000 11:0000 10000000000000000000000000</td> <td></td> <td></td> <td></td> <td></td> <td>1942 - 1940 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 -</td>	Ins	st. Model #			Articular (1006) 2000 11:0000 10000000000000000000000000					1942 - 1940 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 -	
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7       Bkgd (menufur)       ILD (menufur)         Model #       Serial #       Cal Due       BCF:         Model #       Serial #       Cal Due       BCF:         Addel #       Serial #       Cal Due       BCF:         Laboratory Results Attached?       (Thid SECTION #)       Yes       No         Correct Results Attached?       (Thid SECTION #)       Yes       No         RCT:       Correct Haues       //A       Badge:       705517       RCT:       N         RCT:       N/A       Badge:       705517       RCT:       N       A       Badge:         RCT:       N/A       Badge:       N       RCT:       A       Badge:       Badge:         RCT:       N/A       Badge:       N       RCT:       A       Badge:         RCT:       N/A       Badge:       N       RCT:       A       Badge:         RADCON Supervisor Review:       Michrael Kreischer       Sublac       Sublac						Dose Instruments					
Model #       Serial #       Cal Due       BCF:         8       Bkgd (memohu)       Leto (memohu)       Cal Due       BCF:         Laboratory Results Attached?       (This 3 EChient dt)       Yes       No         Comments/Reference Surveys/Released To (as applicable):       PAd       bas       been cleaned + is ready To be painted.         Max       No       No       No       No         Comments/Reference Surveys/Released To (as applicable):       PAd       bas       been cleaned + is ready To be painted.         Max       No       No       No       No         RCT:       Orey Haves       Badge:       705517       RCT:       No         RCT:       N/A       Badge:       No       Badge:       Badge:         RCT:       N/A       Badge:       No       Badge:       Badge:         RCT:       N/A       Badge:       No       Badge:       Date         RADCON Supervisor Review:       Michael Mireischer       Sublead       Gadded       Gadded	1 -		and the second			Cai Due		BCF:			
Model #       Serial #       Cal Due       BCF:         Bkgd (mrem/hr)       Laboratory Results Attached?       (This 3chrow at)       Yes       No         Laboratory Results Attached?       (This 3chrow at)       Yes       No         Comments/Reference Surveys/Released To (as applicable):       Pad       has       been cleaned + is ready To be pallotted.         RCT:       Correy Hawes       //n       //n         RCT:       N/A       Badge:       735517       RCT:       N         RCT:       N/A       Badge:       No       Badge:       Badge:         RCT:       N/A       Badge:       N       Badge:       Badge:         RCT:       N/A       Badge:       N       Badge:       Badge:         RCT:       N/A       Badge:       A       Badge:       Badge:         RCT:       N/A       Badge:       A       Badge:       Badge:         RCT:       Nichael Kreischer       Sublee Results       Co-12-2013       Date	DK	kgu (mienuir)		LCC (inclusion).							
8       Bkgd (mem/hr)       Leto (mem/hr):         Laboratory Results Attached?       (This Stell) of)       Yes       No         Comments/Reference Surveys/Released To (as applicable):       Pad       has       been cleaned' + is ready To be painted.         RCT:       Correy Haves       //       No         RCT:       Date       Badge:       705517       RCT:       No         RCT:       N/A       Badge:       No       Badge:       Badge:         RCT:       N/A       Badge:       Badge:       Badge:       Badge:         RADCON Supervisor Review:       Michael Kreischer       Badge:       Co-(2-2013)       Date	- M	odal #		Serial #		Cal Due	A	BCF:			
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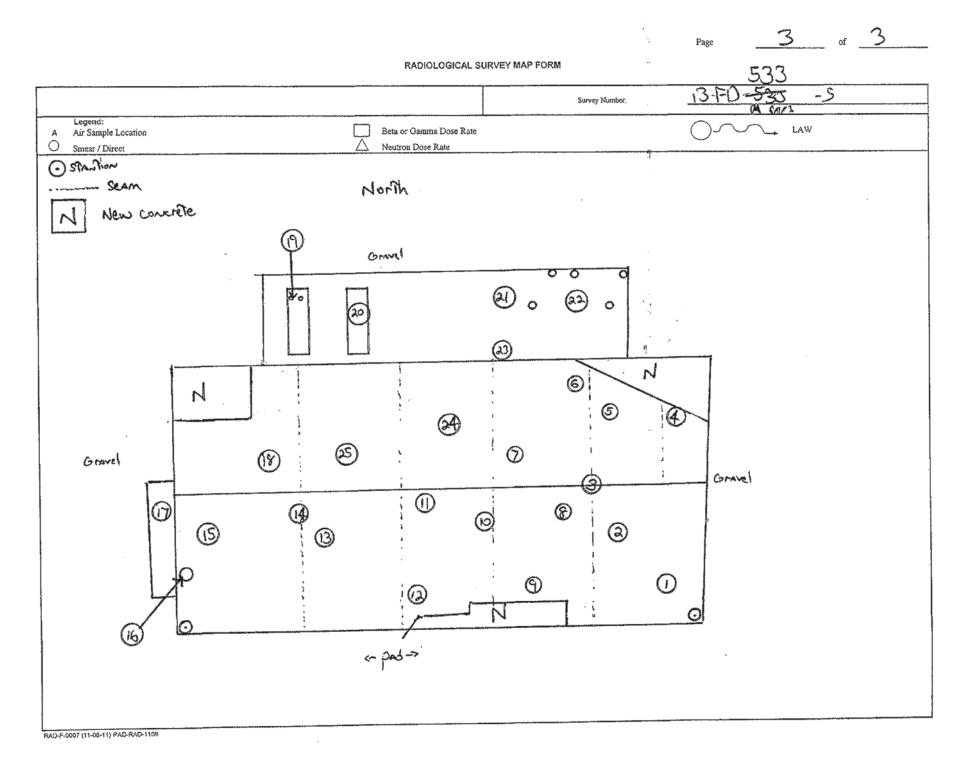
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Instrument		tal α	Remo	vable a	 	al β/γ	Remo	able β/γ	Removable	~	Removable B/	-10									
		100cm2		100cm2	dpm/1 bkg(cpm)	100cm2		00cm2	cpm/LAW bkg(cpm)		cpm/LAW bkg(cpm)	4									
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RAD-F-0008 (11-08-11) PAD-RAD-1109



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Survey No		5-FD-5	544 -5			Page	1	of <u>3</u> 3	
0		117/13	Completed Time:	1242	RWP Number:	Pad-FD-29			
Complete				10-10-	KwP Nubbes;		A 1		
Location of	of Survey-General (Si	ite/Bldg.):	-340	Specific	(Room/Area/Item):	WEST CONCRETE	1		
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		Q	CONCIENCE						
and the second					nt information		en de la compañie		4557878283
STREET, STREET, ST	Inst. Model #	Ludiz	Serial #	223455	Cal Due	9/8/13	Probe Model	43-5	
1	Bkgd (cpm):	0.4	MDC Pt (dpm)	46	MDC Pl (dpm)	61			
C.	Inst. L <sub>+</sub> (cpm)	<u>~~</u>	CF Pr.	7.69	CF PI:	10.12			
OPERATOR ST	Inst Model #		Serial #		Cal Due		Probe Model		
2	Bkgd (cpm):		MDC Pt (dpm)	NA	MDC Pl (dpm)				
α	Inst. L <sub>e</sub> (cpm)		CF Pt:		CF PI:				
	Inst. Model #	Lus 12-	Serial #	168834	Cai Due	7/26/13	Probe Model	44-9	_
3	Bkgd (cpm):	254	MDC Pt (dpm)	4,55	MDC Pl (dpm)	30.33			
P Managara Managara	Inst. L <sub>e</sub> (opm) Automatication (Contraction) Contraction (Contraction)	276	CF Pt.	<u>4.55</u>	CF Pl: PS-100 PC ACCEPTED				
1312042009999	Inst. Model #		Serial #	NA	Cal Duo		Probe Model		
4 R	Bkgd (cpm):		MDC Pt (dpm) CF Pt:	1- A	MDC Pl (dpm) CF Pl:	,		•	
q Maria	Inst. L. (com)			Labor dory	Smean Instruments				
	Inst, Model #	Tr3 312		261208	Cal Due	11/30/13	Probe Model	43-10-1	
5	α. Bkgd (cpm): β Bkgd (cpm):	0.1	α MDC (dpm) β MDC (dpm)	72	α, Jasi. L <sub>e</sub> (opm) β Inst. L <sub>e</sub> (opm)	66	α CF Pt β CF Pt	2.64	- · [
	242-4 M-10-6 A-6 4-6 4-7 - 7 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 -								
	Inst. Model #	Nill	Serial #	····	Cal Due		Probe Model	**************************************	
6	ot Əkgd (spm): β Bkgd (spm):		α MPG (dpm) β MDC (dpm)		α izut, Le (opm) β izst, Le (opm)		β CF PI:		
<b>S</b> hiring a				Badiation	Disc Instruments 2			Sali La Galeria	
7	Model # Bkgd (arem/ar)		LLD (orren/hc):		Cal Due	A	BCF:		
	THE PERCENT OF THE OWNER AND THE PERCENT OF THE PERCENT								
	Model #		Serial #		Cal Due		BCF:		
8	Bkgd (mrem/hr)		LLD (mreavlu):			<u></u>		wheeled #147 PT	
Laborato	ry Results Attached?			Yes	No	)			
			A MA						
Commen	ts/Reference Surveys/	Released To (as applic	able): Dry CONSTITU	202	ş				
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	1		2 Contractions	·· 705527	DOD	NIZ		Badge: N	1
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				n In	B	~~··			
RADCO	N Supervisor Review	:	Michael Kr	alsher Deleis	yes all and for	askin) - Congra	7-7013_ Date		
RAD-F-0	002 (11-08-11) PAD-	RAD-1109				T			

	Survey Ni	mber:	13-F	D- 5	544				ALGORVET GO		Oran	Page _2 of _3	
Instrument	To	ial α	<b>S</b> Remo	vable $\alpha$	3 Tota	ι β/γ	Remov	able β/y	Removable a	Removable \$/y			
	dpm/ bkg(cpm) CF:	0.4 10.12	dpm/ bkg(cpm) CF:	00cm2	bkg(cpm) CF: 3	0.33	bkg(cpm) CF:		cpm/LAW bkg(cpm) p	cpm/LAW bkg(cpm)			
liem No.	Lc= gross cpm	dpm 100cm2	Lc= gross cpm	dpm 100cm2	Lc= gross cpm	dpm 100cm2	Lc= gross cpm	dpm 100cn De	Lc== 0.0 LAW α cpm/LAW	Lc= .0.0 LAW β/γ cpm/LAW		Sample Location and/or remarks	· RCI Initials
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7	4	A	1 <u>45</u> 13		2	A		1613 137					
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Comments:

RAD-F-0008 (11-08-11) PAD-RAD-1109

NOTE: Any response of the instrument that is 2 Lc is considered to be above background.

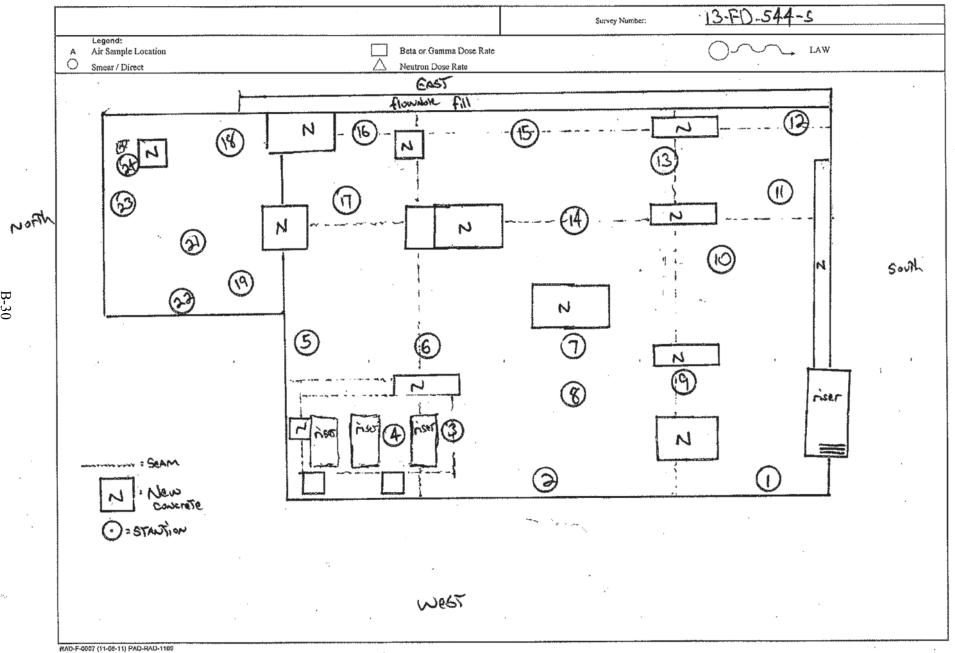
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RADIOLOGICAL SURVEY MAP FORM

of <u>3</u>

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Page



		2 A3		ADIOLOGICAL SI	JRVEY COVER	FORM		
Survey N	·: <u>13-F</u>	2-0585	-5			Page	1_	or
Complete	ed Date: 7-8-1	3	Completed Time:	1030	RWP Number:	PAD-FD-2	9448RO	• :
Location	of Survey-General (Site/B)	ig.): <u>C-34</u>	0	Specific	(Room/Area/Item);	PAD	4	
Material	Other Job Description:	INFOR	MATIONAL	SURVEY	OF PA	D PRIOR TO	> PAINTIN	าสี
-				/	NA	-		0
				Instrumer	t Information			
动动动	ร์ให้ (Matternational agent) (1977)		www.committeenEdulem.co		7 Field Instruments -			
	insi, Model #	4D12	Serial #	223965	Cal Due	9-8-13	Probe Model	435
1	Bkgd (cpm):	0.4	MDC Pt (dpm)	46	MDC Fl (dpm)	61		
α	Inst. L. (cpm)	2	CF Pt:	7.69	CF PI:	10,12	an a	
	Inst. Model #		Serial #		Cal Due		Probe Model	
2	Bked (opin).		MDC Pt (dpm)		MDC Pl (dpm)			and the second se
Contraction of the	Inst. L. (opm)		CF PI: CONTACTORISTICS		CFA		anan atau anan na ƙa	n an
CALINES CO	Inst. Model #	u D   2	Sorial #	1103034	Cal Due	7-21013_	Probe Model	V19
3	Bkgd (cpm):	123	MDC Pt (dpm)	248	MDC PI (dpm)	11095		

	Inst. Model #	LUDIZ	Sorial #	162039	Cal Due	721013	Probe Model	\$9-7	-
3	Bkgd (cpm):	[23	MDC Pt (dpm)	248	MDC Pl (dpm)	1655			
β	Inst. L. (cpm)	149	CF Pc	4.55	CF PI:	3033	*********	nis al 1966 - State State and State of	AMARIE-CONVERS
用時間									
	Inst. Model #	the second s	Serial #		Cal Due		<ul> <li>Probe Model</li> </ul>		-
4	Bkgd (com)	Ann 1914 - 1914 - 1914 - 1914	MDC Pt (dpm)		MIDE PI (dpm)				
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and the second		and design of the state as			Smear Instroments -	· · · · · · · · · · · · · · · · · · ·	NU COMPANY AND AND A DOMESTIC	10 01	Barris Mary
-	Inst. Model #	Lup 2929	Serial #	24408	Cal Due	11-30-03	Probe Model	43-10-1	-
5	or Bkgd (epm):		a, MDC (dpm)		at last, Le (opm)		a CF Pt	2.72	-
100220113002	β Bkgd (cpm):	49	β MDC (dpm)	- 69	β tost L. (epm)		β CF Pt αποτικαι και στη προσφαία (βάλα βαλά βαλά βαλά βαλά βαλά βαλά βαλά	2.04	
1.01.0	en and see the second						Probe Model		STREET, STR
	Inst. Model #		Serial # cx MDC (dpm)		Cal Due		a CP PL		
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mericela	β Bkgd (cpm):		present and a second second	STREET STREET	Duce Instruments		alor of the second states		STAR HESS
ann an Anna	Madel #	characterization and an antibulat	Serial #	SAT MALE AND A SAME AND A SAME	Cal Due		BCF:	AND MADE AND	
7	Bkgd (mronettr)		LLD (mrenvhr):	<b></b>	- ^ ····		e STA B <del>raiss</del>		
a series and the series of the									
	Model #		Serial #		Cal Dus		BCF:		
1	Bkgd (mrem/ar)		LLD (mrenvhr):						
V_0	Drgo (andient)		Lob (menom).						
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7-8-2013 Date

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RADCON Supervisor Review:

RAD-F-0002 (11-08-11) PAD-RAD-1109

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	dpm/1 bkg(cpm)		dpm/l bkg(cpm)	00cm2	dpm/1 bkg(cpm)	00cm2	dpm/1 bkg(cpm)		bkg(cpm)	LAW	cpm/. bkg(cpm)	Α₩,								5.00	
$-E_{\rm const}$		10.12.	CF:	2.12	CF: 3	0.53	CF:	2.64	用的生命												
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21	19	188	21	55	445	9,766										*****					
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RAD-F-0008 (11-08-11) PAD-RAD-1109

NOTE: Any response of the instrument that is  $\geq$  Lo is considered to be above background.

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	Survey Nu	mber:	r	3-20	-05	85	-5				Page <u>3</u> of <u>4</u>
Instrument		el α 00cm2	Remo	vable a		1 β/y 00cm2	Remove	ble ß/y 00cm2	Removable a opm/AW	Removable B/	
	bkg(cpm) CF: /	0.4	bkg(cpm) CF: Lc=	1 2.72	bkg(cpm)		bkg(cpm) CF: Lc=	48	bkg(cpm)	bkg(cpm)	
Item No.	gross cpm	dpm 100cm2	gross cpm	dpm 100cm2	gross cpm	dpm 100cm2	gross cpm	dpm 100cm2	LAW a cpm/LAW	LAW β/γ cpm/LAW	Sample Location RCT and/or remarks Initials
26	NA	NA	5	11	NA	HA	90	(11	NA	NIA	SEE AMORED MAD DETE
27			7	17			116	180			
28			12	30			76	74			
29			4	9	k	1	83	93			
30	NA	NA	6	14	NA	NA	68	53			
31	16	198	4	9		2,548	70	59			
32	8	77	2	2h		4,368		CLe			
33	5	47	0	Cle		45,192	42	4le			
34	16	158	8	20	1	15,529	52	2le			
35	10	97	1		1	75,916	62	40			
36	NA	No		<le Cle</le 	NAS	NA	48	Kle Kle			
37		$\vdash$	2	Che Che	┼-┦		59	che -			
31			6	14	<u>+</u>		45	Cu			
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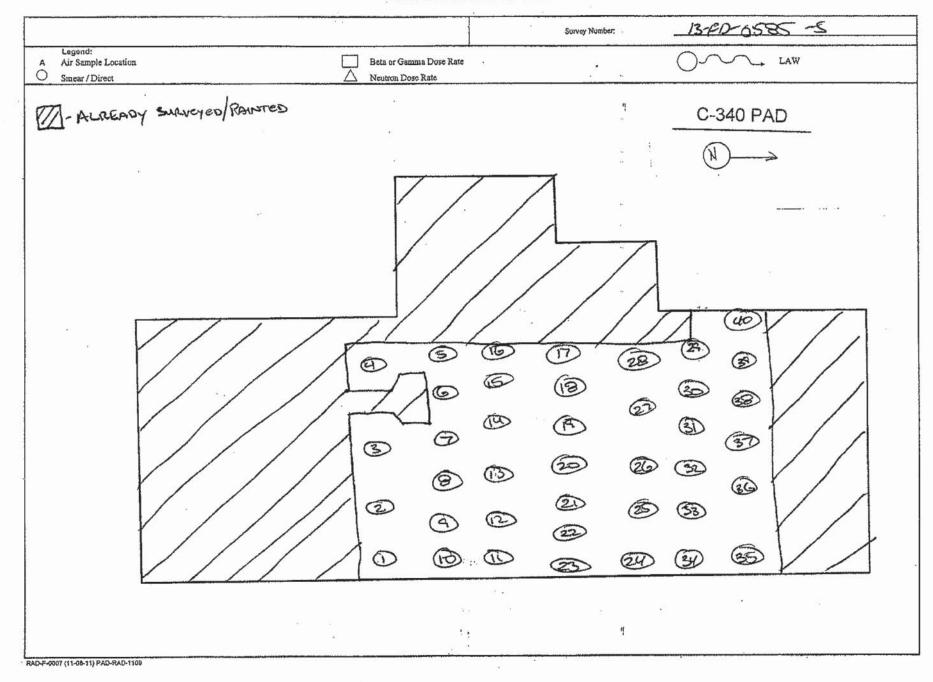
RAD-F-0008 (11-08-11) PAD-RAD-1109

RADIOLOGICAL SURVEY MAP FORM

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Page



**POST-FIXATIVE SURVEY RESULTS** 

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			RAL	IOLOGICAL SURVEY COVER F	ORM		
Survey N	o:	13-40-	0635 - 5		Page		of <b>5</b>
Complete	d Date:	8-1-13	Completed Time:	1500 RWP Number:	PANJ- FO-	29448	Rev 0
Location	of Survey-General (	Site/Bldg.):	0-340	Specific (Room/Area/Item);	CONCRETE	BUILDIN	G PAD
Matorial	Other Job Descripti			CHARACTERIZATION			
waterial /	Other 100 Descript	ion:	· · · · · · · · · · · · · · · · · · ·	CHARACTERITERITOR			
				N/A			
				Instrument Information			
				Contamination / Field Instruments			
1	Inst Model #	······	Serial #	Cal Due		Probe Model	
α	Bkgd (cpm).		MDC Pt (dpm) CF Pt:	MDC Pl (dpm) CF Pl.			
l "	Inst L <sub>e</sub> (com)			Çı Fi.			
	Inst Model #		Serial #	Cal Due		Probe Model	
2	Bkgd (opm):		MDC Pt (dpm)	MDC PI (dpm)		-	
α	Inst. L <sub>e</sub> (cpm)		CP Pt	CF PI			
	1		Serial #	Cal Due		Probe Model	
3	Inst Model # Bkgd (cpm)		MDC Pt (dpm)	A Car Die MUC PI (dpm)		Probe Wodel	
l a	Inst. L. (cpm)	·	CF Pi	CF PI			
P P	mat: actaping	<u></u>					
	Inst Model #		Serial #	Cal Due		Probe Mode!	
4	Bkgd (opm)		MDC Pt (dpm)	MDC PI (dpm)			
β	Inst L <sub>e</sub> (cpm)		CF Pt-	CF PI:			
L	<u></u>		·····	Laboratory / Smear Instruments			
5	Inst. Model #		Serial #	Cal Due	<u></u>	Probe Model	
	α Bios (cpm)	······································	α MOC (dpm)	α hist. L <sub>ε</sub> (cpm) β linst. L <sub>ε</sub> (cpm)		α CF Pt β CF Pt	·
	β Bkgd (cpm)		β MDC (dpm)	p inst. L <sub>k</sub> (cpm)		p of Pt.	
	Inst. Model #	hisium 2	929 Serial #	261408 Cal Due	11-30-13	Probe Model	43-10-1
6	<4 Bigd (cpm)	1	ct MDC (dpm)	<u>1</u> 2 α Inst. L <sub>e</sub> (opm)	3	α CF Pt:	2.72
	β Bkgd (cpm)	45	β MDC (dpm)	67 β Inst. L. (cpm)	57	βCFPI.	2.64
				Radiation/Dose Instruments			
7	Model #	·	Serial #	Cai Due		9CF:	
1	Bkgd (mrem/hr)		LLD (mrem/hr):	The second	and the second		
1		et al la constant				SCF:	••••••
	Model #		LLD (mrem/hr);	Cal Due			
	-Nkgd (mrenzhr)	· · · · · · · · · · · · · · · · · · ·	EED (intent/m).	·····	· · · · · · · · · · · · · · · · · · ·		
Laborator	y Results Attached?			Yes No			
	•		Contractor		a dana N	. Current	S WERE TAKEN
Comment	s/Reference Surveys	Released To (as applicab	10): SMEARS MERE	TAKEN TH SUSPE	TH AREAS N	O SMEAA	S WERE ITKEN
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	Coney 4	AWES LO	A	705527 RCT: TA	AVD _	ta Val	Badge: 704869
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0002 (11-08-11) PAD

Survey Number: 13-FA\_ 0635 - S

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strument			}	(		·		í.	I	1			
		alα		vable a		tal β/γ		able β/γ	Removable a	Removable β/γ			
5	dpm/1 kg(cpm)	00cm2	dpm/ bkg(cpm)	100cm2	dpm bkg(cpm	100cin2	bkg(cpm)	100cm2	cpm/LAW bkg(cpm)	cpm/LAW bkg(cpm)			
Ľ	CF:		CF:	7.12	CF:	/	CF:	2.64					
	Lc=		Lc≖	2.12	Lc=		Lc=	51	Lc= 0.0	Lc= 0.0			D.C.C.
ltem No.	gross cpin	dpm 100cm2	gross cpm	dpm 100cm2	gross cpm	dpm 100cn		dpm 100cm2	LAW a cpm/LAW	LAW β/γ cpm/LAW	a	ample Location and/or remarks	RCT Initials
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RAD-F-0008 (11-08-11) PAD-RAD-1109

13-FD-0635 -C Survey Number:

<u>3</u> of <u>5</u> Page Instrument 6 6 Total α Removable o Total B/y Removable B/y Removable a Removable B/y dpm/100cm2 dpm/100cm2 dpm/100cm2 cpm/LAW dpm/100cm2 cpm/LAW 
 Upin/toteni2
 Cpin/t

 bkg(opm)
 4.5
 bkg(opm)

 CF:
 2.64

 Lc=
 5.7
 Lc=
 bkg(cpm) bkg(cpm) bkg(com) bkg(cpm) CF: CF: 2.72 CE Lc= 0.0 Lc= Lc≖ Lc≃ Item gross dpin gross LAW a LAW B/Y Sample Location RCT dpm gross dpm gross dpm 100cm2 100cm2 No. cpm cpm cpm 100cm cpm 100cm2 cpm/LAW cpm/LAV and/or remarks Initials See MAD 45 <le 26 62 ١ C14 3 46 6 27 Cle  $\mathbb{A}$ 54 28 <1e  $< 1_{\ell}$ 0 29 3 6 <le 45 ų <1e SL 30 66 (le Λ 31 36 ۱ Cle 46 32 33 45 ъ Cle  $\nabla$ 34 57 32 <Lc 35 37 h 59 14 6 H 14 4 TV A 36 <ie <1. 38 2 37 A 54 A 0 38 0 53 V 39 53 1 V (le 40 41 2 Cle 3 ما 48 üι 3 32 ما 51 42 43 105 159 25 10 178 352 56 ЧY 22 103 154 25 45 0 36 109 14 46 6 47 Ĝ 65 53 4 <le 48 <le 43 Ď V V 55 ЦG KLc. 2 Cle MAP SET Å CH 49 23 59 Cle 50 Comments: NIA

RAD-F-0008 (11-08-11) PAD-RAD-1109

	Survey Nu	mber:		13-FI	<u>)- ()</u>	635	~	S	-		Page	<u> </u>	f <u>5</u>	
Instrument		al α 00cm2		6 ovable α /100cm2 ) 212 3		al β/y 100cm2		6 rable β/y 100cm2 45 2.64 57	Removable a cpm/LAW bkg(cpm) Lc= 0.0	Removable β/y cpm/LAW bkg(cpm) Le= 0.9		••••••••••••••••••••••••••••••••••••••		· · · · · · · · · · · · · · · · · · ·
Item No.	gross cpm	dpm 100cm2	eross cpm	dpm 100cm2	gross cpm	dpm 100cm2	eross	dpm 100cm2	LAW α cpm/LAW	LAW β/γ cpm/LAW		Sample I and/or r		RCT Initials
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1996 B. 1997

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3-FA-0635 -5 • • Survey Number: Legend: LAW Beta or Gamma Dose Rate A Air Sample Location . Ο Smear / Direct Neutron Dose Rate i. 'n C-340 PAD ها 20 20 (57) (48) (49) 58 (15) (16) (18) (7) . 56) Ø 25 24 (35) 64 60) (14) (37)  $\odot$ 67 35 (70)54 65 46 (3Š) 55 ઉ૧ (13  $\odot$ [45] 27 72 (SI) 3 60 64 (44) (4)29 (3) (1) 73) 34 63 (53) 61 52 3 62) 47 5 11  $^{()}$ 3 6  $(\cdot, \cdot)$ 10  $\bigcirc$ (4) 3 2 ٠,

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**APPENDIX C** 

SUMP WATER AND PIT SAMPLING ANALYTICAL RESULTS

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# PaducahOREIS Report for: DD13-340-CONPIT

340CONPIT-BF		from:		on 2	/21/2013	Media: WQ		SmpMethod:	
Comments:									
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
РРСВ									
PCB-1016	0.17		ug/L	U	0.17		PGDP	SW846-8082	/ X /
PCB-1221	0.18		ug/L	U	0.18		PGDP	SW846-8082	/ X /
PCB-1232	0.14		ug/L	U	0.14		PGDP	SW846-8082	/ X /
PCB-1242	0.1		ug/L	U	0.1		PGDP	SW846-8082	/ X /
PCB-1248	0.12		ug/L	U	0.12		PGDP	SW846-8082	/ X /
PCB-1254	0.07		ug/L	U	0.07		PGDP	SW846-8082	/ X /
PCB-1260	0.05		ug/L	U	0.05		PGDP	SW846-8082	/ X /
PCB-1268	0.09		ug/L	U	0.09		PGDP	SW846-8082	/ X /
Polychlorinated biphenyl	0.18		ug/L	U	0.18		PGDP	SW846-8082	/ X /
340CONPIT-5		from: C	C-340-A	on 2	/21/2013	Media: SZ		SmpMethod: GR	
Comments: 35 g Con	crete E. Wall El	evator shaft	Pit35 g Concre	ete E. Wa	all Elevator	shaft Pit			
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
PPCB	rteouto	2.101	onito	quui	11010 21		Lub	Method	0/0//(
PCB-1016	0.77		mg/kg	UY	0.77		PGDP	SW846-8082	/ X /
PCB-1221	1		mg/kg	U	1		PGDP		/ X /
PCB-1232	0.77		mg/kg	U	0.77		PGDP		/ X /
PCB-1242	0.46		mg/kg	U	0.46		PGDP		/ X /
PCB-1248	1.91		mg/kg	X	0.40		PGDP		/ X /
PCB-1254	0.69		mg/kg	U	0.69		PGDP		/ X /
PCB-1260	0.03		mg/kg	U	0.00		PGDP		/ X /
PCB-1268	0.61		mg/kg	U	0.61		PGDP		/ X /
Polychlorinated biphenyl	1.91		mg/kg	0	1		PGDP		/ X /
			0.0						
340CONPIT-1		from: C	С-340-В	on 2	/21/2013	Media: SZ		SmpMethod: GR	
Comments: 30 g Con	crete E. Wall, N	. End Ram	Pit - North Poin	t of Larg	e Ram Pit30	0 g Concrete E.	Wall, N		
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
РРСВ									
PCB-1016	1.92		mg/kg	U	1.92		PGDP	SW846-8082	/ X /
PCB-1221	2.49		mg/kg	U	2.49		PGDP	SW846-8082	/ X /
PCB-1232	1.92		mg/kg	U	1.92		PGDP	SW846-8082	/ X /
PCB-1242	1.15		mg/kg	U	1.15		PGDP	SW846-8082	/ X /
PCB-1248	7.89		mg/kg		1.92		PGDP	SW846-8082	/ X /
	1.72		mg/kg	U	1.72		PGDP	SW846-8082	/ X /
PCB-1254	1.72								
PCB-1254 PCB-1260	1.92		mg/kg	U	1.92		PGDP	SW846-8082	/ X /
				U U	1.92 1.53		PGDP PGDP		X     X

"X" qualifier indicates that the laboratory included a comment with the results. For these samples, the laboratory's comment included the percent difference between the two columns on the instrument, and that the laboratory reported the higher result for Aroclor 1248.

"Y" qualifier means the matrix spike/matrix spike duplicate recovery and/or RPD failed acceptance criteria.

340CONPIT-1D		from: 0	С-340-В	on 2	/21/2013	Media: SZ		SmpMethod: G	R
Comments: 35	g Concrete E. Wall, N	I. End Ram	Pit Duplicate -	North Po	int of Large	Ram Pit35 g Co	oncrete		
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
PPCB	2.02				2.02			C) N/0.4C, 0.000	
PCB-1016	3.83		mg/kg	U	3.83		PGDP	SW846-8082	/ X
PCB-1221	4.98		mg/kg	U	4.98		PGDP	SW846-8082	/ X
PCB-1232	3.83		mg/kg	U	3.83		PGDP	SW846-8082	/ X
PCB-1242	2.3		mg/kg	U	2.3		PGDP	SW846-8082	/ X
PCB-1248	16.9		mg/kg		3.83		PGDP	SW846-8082	/ X
PCB-1254	3.45		mg/kg	U	3.45		PGDP	SW846-8082	/ X
PCB-1260	3.83		mg/kg	U	3.83		PGDP	SW846-8082	/ X
PCB-1268	3.07		mg/kg	U	3.07		PGDP	SW846-8082	/ X
Polychlorinated bipher	ıyl 16.9		mg/kg		4.98		PGDP	SW846-8082	/ X
340CONPIT-2		from: (	С-340-В	on 2	/21/2013	Media: SZ		SmpMethod: G	R
Comments: 43	g E. Wall Middle of R	am Pit - Mid	Idle Point of La	rge Ram	Pit43 g E. V	Vall Middle of R	am Pit -		
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
PPCB									
PCB-1016	15.3		mg/kg	UY	15.3		PGDP	SW846-8082	/ X
PCB-1221	19.9		mg/kg	U	19.9		PGDP	SW846-8082	/ X
PCB-1232	15.3		mg/kg	U	15.3		PGDP	SW846-8082	/ X
PCB-1242	9.19		mg/kg	U	9.19		PGDP	SW846-8082	/ X
PCB-1248	305		mg/kg	X	15.3		PGDP	SW846-8082	/ X
PCB-1254	13.8		mg/kg	U	13.8		PGDP	SW846-8082	/ X / X
PCB-1260	15.3		mg/kg	U	15.3		PGDP	SW846-8082	/ X / X
					12.3		PGDP		
PCB-1268 Polychlorinated bipher	12.3 1yl 305		mg/kg mg/kg	U	12.3		PGDP	SW846-8082 SW846-8082	/ X / X
340CONPIT-3		from: C			/21/2013	Media: SZ		SmpMethod: G	R
Comments: 37	' g E. Wall, S. End Rar	n Pit - South	n Point of Large	e Ram Pi	t37 g E. Wa	II, S. End Ram	Pit - Sou		
Analysis	Results	Counting Error	Units	Result Qual		orting mit	Lab	Method	V/V/A*
PPCB									
PCB-1016	7.74		mg/kg	U	7.74		PGDP	SW846-8082	/ X
PCB-1221	10.1		mg/kg	U	10.1		PGDP	SW846-8082	/ X
PCB-1232	7.74		mg/kg	U	7.74		PGDP	SW846-8082	/ X
PCB-1242	4.64		mg/kg	U	4.64		PGDP	SW846-8082	/ X
PCB-1248	32.8		mg/kg		7.74		PGDP	SW846-8082	/ X
PCB-1254	6.96		mg/kg	U	6.96		PGDP	SW846-8082	/ X
PCB-1260	7.74		mg/kg	U	7.74		PGDP	SW846-8082	/ X
					6 10		PGDP	SW846-8082	
PCB-1268	6.19		mg/kg	U	6.19		FGDF	311040-0002	/ X

"X" qualifier indicates that the laboratory included a comment with the results. For these samples, the laboratory's comment included the percent difference between the two columns on the instrument, and that the laboratory reported the higher result for Aroclor 1248.

"Y" qualifier means the matrix spike/matrix spike duplicate recovery and/or RPD failed acceptance criteria.

340CONPIT-4		from: C	С-340-В	on 2	2/21/2013	Media: SZ	SmpMethod:	GR
Comments: 4	4 g Concrete NE corner	r of small pit	NE of Ram Pit	- Small	Ram Pit44 g C	Concrete NE corner o	f	
Analysis	Results	Counting Error	Units	Result Qual	Foot Reportin Note Limit		Method	V/V/A*
PPCB								
PCB-1016	0.77		mg/kg	U	0.77	PGDP	SW846-8082	/ X /
PCB-1221	1		mg/kg	U	1	PGDP	SW846-8082	/ X /
PCB-1232	0.77		mg/kg	U	0.77	PGDP	SW846-8082	/ X /
PCB-1242	0.46		mg/kg	U	0.46	PGDP	SW846-8082	/ X /
PCB-1248	2.56		mg/kg		0.77	PGDP	SW846-8082	/ X /
PCB-1254	0.69		mg/kg	U	0.69	PGDP	SW846-8082	/ X /
PCB-1260	0.77		mg/kg	U	0.77	PGDP	SW846-8082	/ X /
PCB-1268	0.61		mg/kg	U	0.61	PGDP	SW846-8082	/ X /
Polychlorinated biphe	nyl 2.56		mg/kg		1	PGDP	SW846-8082	/ X /
340CONPIT-6		from: C	C-340-B	on 2	2/21/2013	Media: SZ	SmpMethod:	GR
	2g concrete W. wall Slo	from: C				Media: SZ ing Pit - Conveyor Pit	- <b>-</b>	GR
	2g concrete W. wall Slo Results					ing Pit - Conveyor Pit	·	GR V/V/A*
Comments: 3.	•	ping Pit - Co	onveyor Pit32g	concrete Result	e W. wall Slopi	ing Pit - Conveyor Pit		-
Comments: 3. Analysis	•	ping Pit - Co	onveyor Pit32g	concrete Result	e W. wall Slopi	ing Pit - Conveyor Pit		V/V/A*
Comments: 3. Analysis <b>PPCB</b> PCB-1016	Results	ping Pit - Co	onveyor Pit32g Units	Concrete Result Qual	e W. wall Slopi Foot Reportir Note Limit	ing Pit - Conveyor Pil <sup>Ing</sup> t Lab	Method	V/V/A* / X /
Comments: 3. Analysis <b>PPCB</b>	Results	ping Pit - Co	onveyor Pit32g Units mg/kg	Concrete Result Qual	e W. wall Slopi Foot Reportin Note Limit	ing Pit - Conveyor Pit t Lab	Method SW846-8082 SW846-8082	V/V/A* / X / / X /
Comments: 3: Analysis PPCB PCB-1016 PCB-1221 PCB-1232	1.92 2.49	ping Pit - Co	Units Units mg/kg mg/kg	Concrete Result Qual U U	e W. wall Slopi Foot Reportin Note Limit 1.92 2.49	ing Pit - Conveyor Pit t Lab PGDP PGDP	Method SW846-8082 SW846-8082	V/V/A* / X / / X / / X /
Comments:         3;           Analysis         PPCB           PCB-1016         PCB-1221           PCB-1222         PCB-1232           PCB-1242         PCB-1242	1.92 2.49 1.92	ping Pit - Co	Units Units mg/kg mg/kg mg/kg	Result Qual U U U U	e W. wall Slopi Foot Reportin Note Limit 1.92 2.49 1.92	ing Pit - Conveyor Pit t Lab PGDP PGDP PGDP	Method SW846-8082 SW846-8082 SW846-8082	V/V/A* / X / / X / / X / / X /
Comments: 3: Analysis PPCB PCB-1016 PCB-1221	Results 1.92 2.49 1.92 1.15	ping Pit - Co	Units Units mg/kg mg/kg mg/kg mg/kg	Result Qual U U U U	e W. wall Slopi Foot Reportin Limit 1.92 2.49 1.92 1.92 1.15	ing Pit - Conveyor Pit t Lab PGDP PGDP PGDP PGDP	Method SW846-8082 SW846-8082 SW846-8082 SW846-8082	V/V/A* / X / / X / / X / / X / / X /
Comments:         32           Analysis         PPCB           PCB-1016         PCB-1221           PCB-1232         PCB-1232           PCB-1248         PCB-1254	Results 1.92 2.49 1.92 1.15 3.6	ping Pit - Co	Units Units mg/kg mg/kg mg/kg mg/kg mg/kg	Result Qual U U U U U U	e W. wall Slopi Foot Reportin 1.92 2.49 1.92 1.15 1.92	ing Pit - Conveyor Pit t Lab PGDP PGDP PGDP PGDP PGDP PGDP	Method SW846-8082 SW846-8082 SW846-8082 SW846-8082 SW846-8082	V/V/A* / X / / X / / X / / X / / X / / X /
Comments:         3           Analysis         PPCB           PCB-1016         PCB-1221           PCB-1232         PCB-1232           PCB-1242         PCB-1248	Results 1.92 2.49 1.92 1.15 3.6 1.72	ping Pit - Co	Units Units mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result Qual U U U U U U	e W. wall Slopi Foot Reportin Note Limit 1.92 2.49 1.92 1.15 1.92 1.72	ing Pit - Conveyor Pit ng Lab PGDP PGDP PGDP PGDP PGDP PGDP PGDP	Method SW846-8082 SW846-8082 SW846-8082 SW846-8082 SW846-8082 SW846-8082	-

"X" qualifier indicates that the laboratory included a comment with the results. For these samples, the laboratory's comment included the percent difference between the two columns on the instrument, and that the laboratory reported the higher result for Aroclor 1248.

"Y" qualifier means the matrix spike/matrix spike duplicate recovery and/or RPD failed acceptance criteria.

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# PIT SURVEY RESULTS

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Complete	ed Date: 2-2	1-13	Completed Time:	1330	RWP Number:	PAD-FD-29	148 KO	
Location	of Survey-General (Si	te/Bidg.):	-340	Speci	fic (Room/Area/Item):	PAD	· · · · · · · · · · · · · · · · · · ·	
Material	/ Other Job Description	: Toron	ATTONAL SURVE	Y OF VA	RUDUS PITS			
				NI NI	A			
				Instrum	ent Information			
1997 25 M				Contamina	tion / Field Instruments			
1	Inst. Model # Bkgd (cpm):	<u>Lup12</u> ;	Serial # MDC Pt (dpm)	264687	Cal Due MDC Pl (dpm)	<u>9-30-13</u> 80	Probe Model	43-5
α	Inst. L. (cpm)	<u> </u>	CF Pt:	7,89	CF PI:	10,38	-	
		Managara ang sarah			Manager Ber Rand Ander Street Street, bury		<b>There is a subseque</b>	
	Inst. Model #		Scrial #	N	Cal Due		Probe Model	
2	Bkgd (cpm):		MDC Pt (dpm)		MDC PT (dpm)			
-	Inst. L. (opm)	Allania was as a constant	CF Pt:	1	CF PI:	RAME OF THE OWNER OF THE OWNER	No dia kaominina dia mandri 2003.	n de la company de la comp
469361	Inst. Model #	Lup 12	Serial #	132229	Cal Due	_5-30-12	Probe Modei	44-9
3	Bkgd (cpm):	61	- MDC Pt (dpm)	184	MDC PI (dpm)	1221		
β	Inst. L <sub>e</sub> (cpm)	80	CF Pt:	4.66	CF PI:	31.07		
ender false				- <u></u>	「正正」などの			
	Inst. Model #		Serial #		Cal Due		Probe Model	
4	Bkgd (cpm):		MDC Pt (dpm)		A CF PI:			
<u> </u>	Inst. L. (cpm)		CF Pt:		CF PI:		n an an an an Anna Anna	and the second second second second
	Inst. Model #	4102529	Serial #	109540	y / Smear Instruments Cal Due	4-2-13	Probe Model	43-10-1
5	a Bkgd (apm):	0.2	Q MDC (dpm)	13	α. Inst. L <sub>2</sub> (cpm)	1-4-13	a CF PL	2.72
	β Bkgd (cpm):	60	β MDC (dpm)	79	β Inst. L <sub>e</sub> (cpm)	74	β CF Pt	2.63
le de la compañía de	and waaling	NOR HEREENDERS VOLUMEN	STERNAR CONTRACTOR	i shinakali na kak	References and a descent	Carl Contractor State	che de la contra la contra de la	n , i geologi kanalanan i
6	Inst. Model #		Serial #		Cal Due	· · ·	_ Probe Model	** <del>**</del> *************************
6	α, Bkgd (cpm): β Bkgd (cpm):		α MDC (dpm) β MDC (dpm)		α lnst L <sub>e</sub> (cpm) β (nst. L <sub>e</sub> (cpm)		α CF Pt: β CF Pt:	
	p okyo (opin).		p woo (april)	Radiatic	on/Dose Instruments	General Alla	роги:	and the second
	Model #		Serial #	and and a second se	Cal Due	and the state of the second state of	BCF:	
7	Bkgd (mrem/hr)		LLD (mrem/ht):	A			F No. 1 and a state of the set o	and the second of the second
(F) Altern								
-	Model #		Serial #		Cal Due	<u> </u>	BCF:	
8	Bkgd (mrem/hr)		LLD (mrem/hr):					
a					~			
Laborator	ry Results Attached?			Y	es 😡		1	
Comment	s/Reference Surveys/R	eleased To (as applicable):						
			4					
			·	N_	<u>ि</u>			
				1	10			
	0 10	1	Jan	2 <u>0</u> 5	<del>t tota</del> to po de <sup>10</sup>		· · · · · · · · · · · · · · · · · · ·	A
RCT:	Davie Que	rles -705th	Badge:	705765	RCT:	NA	1 NA	Badge:A
DOT:	NA		MABadge:	NA	RCT:	NB-	1 No-	Badge: NA
RCT:	N/3		MABadge:		NU1	· • • •		Dudge IVHC.
			Jeff McAlpi	117	. /			

.

	Survey Nu	imber:	<u>13-</u> F	20-0	182	-5					Page Z of Z	
Instrument		1	e	5	3		5		NIA	NIG.		
Weitsteren		talα 100cm2		vable a		al β/γ 100cm2		rable β/γ 100cm2	Removable α cpm/LAW	Removable β/γ cpn/LAW		
	bkg(cpm)		bkg(cpm)		bkg(cpm)		bkg(cpm)		bkg(epm)	bkg(cpm)		
	CF: Lo=	10-38		2.72		31.07	CF:		Lo= NA 0.0			
Item	gross	dpm	ZTOSS	dpm	Lc= gross	dpm	Lc= gross	74 dpm	LC= NIA U.U LAW a	Lc= Ν Δ 0.0 LAW β/γ	Sample Location	RCT
No.	cpm	100cm2	cpm	100cm2	cpm	100cm2	cpm	100cm2	cpm/LAW	cpm/LAW	and/or remarks	Initials
<u> </u>	194	2,003	પા	m	2,583	78,359	226	437	NA	Nha	WEST PIT (NONTY)	Pe
2		3,384	47	127	7.023	216,309	249	497			went Pit (MD)	
3	647	6,705	91	247	3,250	99,082	358	784			WEST RIT (Sourth)	
ч	194	1,900	136	369	8,395	258937	653	1,560			ELEVATOR BOT	
5	32	322	20	54	451	12,117	165	276			RAM PIT I (NORT)	
6	25	249	19	51	351	9,010	169	287			RAM PIT 2 (MID)	
2	31	311	2.3	62	534	14,696	2410	489			RAM RT 3 (South)	
8	69	706	49	133	3,320	101,257	364	800		<u>v</u>	Small Pit NoorhEast	V
9	NJA	NIG	1	2	NIG	NA	54	ele	NB	NA	Lug 2929 Country Area	De 1
	1									· · ·		
		ļ										
									N		· · · · · · · · · · · · · · · · · · ·	
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1				1								
Linus					4.,							

Comments: NoTE: Pits HAD STANDING WATER IN The BOTTONG OF THEM, ONly Accessible side walls surveyed. De

NA

RAD-F-0008 (11-08-11) PAD-RAD-1109

NOTE: Any response of the instrument that is  $\geq$  Lc is considered to be above background.

C-10

**APPENDIX D** 

AIR QUALITY MONITORING PROGRAM

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Agent	Number of Samples	Range of Results	Occupational Exposure Limit	Units
Asbestos <sup>1</sup>	52	(BDL-0.01356)	0.07	(f/cc)
Aluminum <sup>2</sup>	20	BDL	0.07	$(mg/m^3)$
Arsenic <sup>2</sup>	20	BDL	0.007	$(mg/m^3)$
Beryllium <sup>2</sup>	20	BDL	1.4	$(\mu g/m^3)$
Cadmium <sup>2</sup>	20	BDL	0.007	$(mg/m^3)$
Chromium <sup>2</sup>	20	BDL	0.35	$(mg/m^3)$
Copper <sup>2</sup>	20	BDL	0.014	$(mg/m^3)$
Iron <sup>2</sup>	20	(BDL-0.00429)	3.5	$(mg/m^3)$
Lead <sup>2</sup>	20	BDL	40	$(\mu g/m^3)$
Magnesium <sup>2</sup>	16	(BDL-0.00113)	7	$(mg/m^3)$
Manganese <sup>2</sup>	20	BDL	0.14	$(mg/m^3)$
Nickel <sup>2</sup>	20	BDL	0.7	$(mg/m^3)$
Selenium <sup>2</sup>	20	BDL	0.14	$(mg/m^3)$
Silver <sup>2</sup>	20	BDL	0.007	$(mg/m^3)$
Uranium <sup>2</sup>	20	(BDL-2.92587)	140	$(\mu g/m^3)$
$Zinc^2$	20	(BDL-0.00036)	1.4	$(mg/m^3)$

Table D.1. Summary of Results for Area Air Monitoring

BDL—below detection limit <sup>1</sup> Analysis performed by Titan Environmental Labs, in accordance with the NIOSH Manual of Analytical Methods, Method 7400, 10-hour time-weighted average.

<sup>2</sup> Analysis performed by ALS Environmental Labs, in accordance with NIOSH Manual of Analytical Methods, Method 7300, 10-hour time-weighted average.

Table D.2. Summary of Results	s for Perimeter Asbesto	s Air Monitoring
Tuble Dizi Summary of Result	J IOI I CI IIICCCI I ISSOCSCO	Sim monitoring

	Number of		Administrative	
Agent	Samples	Range of Results	Control Level	Units
Asbestos <sup>1</sup>	1,386	(BDL-0.01391)	0.01	(f/cc)

<sup>1</sup> Analysis performed by Titan Environmental Labs, in accordance with the NIOSH Manual of Analytical Methods, Method 7400.

Agent	Number of Samples	Range of Results	Occupational Exposure Limit	Units
Asbestos <sup>1</sup>	165	(0.00061—1.8923)	0.07	(f/cc)
Asbestos <sup>2</sup>	127	(BDL-0.24522)	1	(f/cc)
Aluminum <sup>3</sup>	5	BDL	0.07	$(mg/m^3)$
Arsenic <sup>3</sup>	5	BDL	0.007	$(mg/m^3)$
Beryllium <sup>3</sup>	5	BDL	1.4	$(\mu g/m^3)$
Cadmium <sup>3</sup>	5	BDL	0.007	$(mg/m^3)$
Chromium <sup>3</sup>	5	BDL	0.35	$(mg/m^3)$
Copper <sup>3</sup>	5	BDL	0.014	$(mg/m^3)$
Iron <sup>3</sup>	5	BDL	3.5	$(mg/m^3)$
Lead <sup>3</sup>	5	(BDL—1.90664)	40	$(\mu g/m^3)$
Magnesium <sup>3</sup>	5	(BDL-0.00296)	7	$(mg/m^3)$
Manganese <sup>3</sup>	5	BDL	0.14	$(mg/m^3)$
Nickel <sup>3</sup>	5	BDL	0.7	$(mg/m^3)$
Selenium <sup>3</sup>	5	BDL	0.14	$(mg/m^3)$
Silver <sup>3</sup>	5	BDL	0.007	$(mg/m^3)$
Uranium <sup>3</sup>	5	(BDL-5.2597)	140	$(\mu g/m^3)$
Zinc <sup>3</sup>	5	(BDL-0.00085)	1.4	$(mg/m^3)$

Table D.3. Summary of Results for Personal Air Monitoring (includes subcontractor personal air sampling)

BDL—below detection limit <sup>1</sup> Analysis performed by Titan Environmental Laboratory, Inc., in accordance with the NIOSH Manual of Analytical Methods, Method 7400, 10-hour time-weighted average. <sup>2</sup> Analysis performed by Titan Environmental Laboratory, Inc., in accordance with the NIOSH Manual of

Analytical Methods, Method 7400, 30-minute excursion. <sup>3</sup> Analyses performed by ALS Environmental Labs, in accordance with the NIOSH Manual of Analytical

Methods, Method 7300, 10-hour time-weighted average.