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DATE: 12 March 1999

TO: JoAnn Camacho, U.S. EPA/ERTC Work Assignment Manager

THROUGH: Edward F. Gilardi, REAC Program Manager

FROM: Barry L. Forsythe II, REAC Task Leader

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT 3-428

Attached please find the following document prepared under this work assignment:

TRIP REPORT: SOIL SAMPLING, 15-19 FEBRUARY 1999
CENTREDALE MANOR (WOONASQUATUCKET RIVER)
NORTH PROVIDENCE, RHODE ISLAND

cc: Central File WA 3-428(w/attachment)
Edward F. Gilardi, REAC Program Manager (w/o attachment)

TRIP REPORT: SOIL SAMPLING, 15-19 FEBRUARY 1999

CENTREDALE MANOR (WOONASQUATUCKET RIVER)
NORTH PROVIDENCE, RHODE ISLAND

MARCH 1999

PREPARED BY:

Barry Forsythe II
ERTC/REAC

Environmental Response Team Center
Office of Emergency and Remedial Response

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1.0 OBJECTIVE

The objective of this project was to provide technical support to the U.S. Environmental Protection Agency/Environmental Response Team Center (U.S. EPA/ERTC) and U.S. EPA Region I with evaluating the extent of contamination and human health risks associated with the Centredale Manor (Woonasquatucket River), North Providence, Rhode Island.

2.0 SITE BACKGROUND

Tracing sources of dioxins that were first discovered in fish and eel taken from the Woonasquatucket River, the U.S. EPA in a July 1998 study of the Woonasquatucket River, found elevated levels of dioxin in sediments in portions of the river. As a result of this study, U.S. EPA Region I (henceforth to be referred to as Region I) performed soil and sediment sampling on and around Centredale Manor in September 1998. Results of these samples were received in January 1999, and showed dioxin concentrations in some areas above 1 part per billion (ppb), the level at which a further investigation is warranted. As a result, Region I took an additional 25 samples around Centredale Manor, the Lee Romano ballfield, and the Boys and Girls Club (January 1999). Five surface soil samples were collected (27 January 1999) and analyzed from the Lee Romano ballfield (REAC 1999). The previous sampling, as well as screening data obtained from additional samples taken in January 1999, showed dioxin up to 14 ppb on the southern portion of the Centredale Manor property, including the drainage swale, and in the wooded area south of Centredale Manor. Since the public has access to some of these areas, Region I made it a priority to further determine the extent of dioxin contamination on and around Centredale Manor.

Centredale Manor is located in North Providence Rhode Island just south of Route 44 on the eastern bank of the Woonasquatucket River (Figure 1). Currently a high rise residential complex is on the site, but previously there was a chemical company and a drum reclamation company on the site property. Just north and adjacent to Centredale Manor is Brook Village, another high rise residential area. Much of this combined property is covered by roadway, parking lots, and the two above mentioned buildings. On the eastern portion of this property is a drainage swale that begins near the north of the property and extends south behind the manor building. It then curves to the west and discharges into a wooded wetland south of the property and eventually into the Woonasquatucket River.

3.0 TECHNICAL APPROACH

3.1 Data Requirements

A site visit was conducted on 22 January 1999. The purpose of the site visit was to identify depositional areas expected to retain translocated dioxin and other contaminants. Evaluation of data from previous sampling efforts was utilized in constructing a statistically sound sampling plan (U.S. EPA 1999) that will accurately estimate the extent of contamination. Maps of the site, including past and future sampling locations, property boundaries, wetlands, surface water, and streets were constructed.

3.2 Observations and Activities

A field investigation was necessary to collect the information described above for use in an extent of contamination assessment.

The REAC sampling team arrived on-site at 1300 hours (15 February 199) and met with JoAnn Camacho (U.S. EPA/ERTC), Tim Goddeyne (U.S. EPA/ERTC), and Ted Bazenas (U.S. EPA Region I). Access to the green-way on the west side of the Woonasquatucket River was not obtained until

16 February 1999. Grid construction was started at the northern portion of the site (CMS-026) as described below (Section 3.2.2). Region I personnel (Beth Deabay, Dan Granz, and Rich Fisher) and Superfund Technical Assessment and Response Team (START) personnel (Shawn Kennedy, Brad Bowen, and Bill Lincourt) arrived on-site Tuesday (16 February 1999) morning. Each morning began with a briefing and a health and safety meeting led by Al Lupiano, REAC. Personnel were placed into teams with specific tasks (Table 1). Surface soils from the site were collected, as described in Section 3.2.4 (Table 2) on 16 (start: 0730, finish: 1700) and 17 (start: 0630, finish: 1800) February 1999 and shipped via Federal Express to Triangle Laboratories (Durham, NC) to be analyzed for dioxin/furans. Michelle Chipaloski, Amanda Daly and Elsa Matos (REAC) transported samples to the FedEx station. Noel Rogers (REAC), with assistance from two START employees (Shawn Kennedy and Brad Bowen) began the geophysical survey on 16 February and finished on 18 February 1999. Photocopies of site logbooks are found in Appenix A.

As mentioned above, this investigation involved the collection of soil for chemical analyses (dioxin/furans) and a geophysical survey. A description of each task is described in detail below.

3.2.1 Sampling Design

The immediate area of concern for this sampling event consisted of the land adjacent to the Woonasquatucket River, bounded on the north by Route 44 and bounded on the south by the northern boundary of Allendale Pond (Figure 2). Within this general area there were three specific areas of concern (Figure 3); the combined properties of Centredale Manor and Brook Village, the drainage areas south of Centredale Manor, and the western river bank across from Centredale Manor. These three areas were selected based on historical data, public access, and depositional patterns. Due to differences in the areas, different sampling strategies were selected. In addition, 8 residential areas were identified for sampling (Table 3).

Area One - Centredale Manor and Brook Village, including the drainage swale east of Centredale Manor: This area also includes the northern most part of the wooded area adjacent to the Centredale Manor property. Since this is a large area and elevated levels of dioxin have been found here, a systematic grid approach was selected, with the origin of the grid based on a randomly generated spot. A 50 foot square grid was generated from this point (Figure 4). A surface soil sample (0-3 inches) was taken at the nodal points of the grid. If the nodal point fell within the footprint of a building, on a parking lot, or another hard surface (i.e. sidewalk) the sample was not taken unless there was an accessible spot within 10 feet of the nodal point. If a nodal point fell on a spot covered by water that was not part of the Woonasquatucket River, the sample was taken. If the intersection of the property line or river bank and a grid line was more than 20 feet from the nearest nodal point, this intersection became a designated sampling point. This resulted in approximately 130 surface soil samples, not including QA/QC samples (Figure 5).

Area Two - Drainage area south of Centredale Manor: Since elevated levels have not been found in this area, a larger grid was selected. The grid was also based on the same random point; however, the grid spacing was 100 feet instead of 50 feet (Figure 4). Surface samples were taken at the nodal points. If a nodal point fell on a spot covered by water that was not part of the Woonasquatucket River or part of Allendale pond, the sample was taken. Locations at the intersections with the property line and the river bank were handled in the same manner as for Area One. This resulted in approximately 38 surface soil samples, not including QA/QC samples (Figure 5).

Area Three - Western river bank across from Centredale Manor: Due to the long narrow nature of this area (Figure 4), and the fact that it does not appear to be a depositional area, a transect approach was selected. A transect was established parallel to the river bank along the high water mark which was based upon visual evaluation and professional judgment. The transect began at the southern edge of the Route 44 bridge, and ran south to the Allendale Pond. The spacing interval along the transect was 100 feet. A surface soil sample was taken at each sampling point. This resulted in 25 surface samples, not including QA/QC samples (Figure 5).

Judgmental Samples: In addition to the aforementioned samples, two upriver samples were taken to verify that the source of the contamination is not upriver of the area of concern. These samples were taken in sandy, depositional areas, north of Route 44. One sample was taken from the bank, and one sample was a sediment sample. Also three samples were taken at areas previously sampled. These samples were taken at locations SS-01, SS-99-04, and SD-30, in addition to other judgmental areas (Figure 2). These samples will be used to help validate the results of the previous samples.

Finally, 10 judgmental samples at 8 locations were also collected. Five residential sampling locations were identified by the Agency for Toxic Substances and Disease Registry (ATSDR) and the Rhode Island Department of Health (RIDOH). The remaining 3 locations were chosen from the information provided to Region I from the public concern hotline. This hotline was established so that area residents could ask questions and suggest possible sampling sites. All requests for sampling received in the hotline by close of business 28 January 1999 were reviewed and visually inspected. A decision to include these samples was based on the proximity of the property to the Woonasquatucket River (between route 44 and Lymansville Dam) and reviewing flood plain maps. A summary of these samples can be found in Table 3.

3.2.2 Grid Construction

A single random coordinate was selected as the base coordinate for the two systematic grids. A base map for the general area of concern was created within the software application Arcview version 3.1. The map was created from the existing Geographical Information System (GIS) coverage maps, and a Global Positioning System (GPS) survey performed 1-2 February 1999 (Amanda Daly, Tim Goddeyne, and George Molnar). Upper and lower boundaries were determined for the X and Y axes of this base map. These upper and lower boundaries were entered into the spreadsheet application QuattroPro version 7.0. Using the random number generator function of QuattroPro, a random X and Y coordinate was selected which fell between these upper and lower boundaries. This random coordinate was located on the base map, and a systematic grid with 50 foot spacing in area one and 100 foot spacing in area two was laid out from this initial coordinate. The grid was aligned so that the north direction corresponded to the Y-axis and the east direction corresponded to the X-axis (Figure 4).

When the sampling team arrived on site they located the random coordinate using GPS, and then marked off the grid from that location. All sample locations were marked with a flag or a stake and verified and recorded by GPS (Figure 5). Deviations in sample locations (Table 4) were noted in field logbooks (Appendix A).

3.2.3 Geophysical Survey

Surface geophysical techniques, including magnetic field and electromagnetic methods, were used to search for buried drums. A Geonics GSM-19 TM magnetometer and a Geonics EM-31TM terrain conductivity meter was used to determine the presence of buried drums. A Geonics EM-61TM high sensitivity metal detector was also utilized. A site grid was established with lines spaced 20 feet (ft) apart and station spacings located every 5 ft.. A base station for checking instrument response and determining magnetic field variations during the survey was located in a metal-free area. Base station readings were taken approximately every 2 hours for magnetometer corrections, and at the beginning and end of each survey day for EM-31 stability checks. Magnetometer readings were stored in the instrument while EM-31 and EM-61 data were stored in data loggers. All data was downloaded to personal computers at the end of each day. Preliminary interpretations of the data were available before demobilization from the site. An independent trip report was prepared for the geophysical survey (Appendix B).

3.2.4 Soil Sampling

Soil samples were collected in accordance with ERTC/REAC Standard Operating Procedure (SOP) #2012, *Soil Sampling*. Soil was collected using a decontaminated stainless steel trowel to a depth of 3 inches. The soil within a 1-foot by 1-foot area was collected and accumulated into a labeled 8 oz. glass jar until sufficient sample volume was obtained for all required chemical analyses. The samples were placed in the appropriately labeled sample containers and transported to a central staging area. The samples were logged into Scribe and packed into coolers on wet ice. The samples were then sent to the specified laboratory via overnight courier. There were 222 soil samples collected from the site, not including QA/QC samples. The soil samples are currently being analyzed for dioxin/furans. The field data sheets for each sample and chains of custody are found in Appendices C and D, respectively.

3.2.5 Sample Analysis

All samples will be analyzed for polychlorinated dibenzo-dioxins and polychlorinated dibenzo-furans (PCDD/PCDF) commonly referred to as dioxin using method SW846/8290. The analysis was contracted out to Triangle Laboratories (Durham, NC). The contract required that the Section 8 specifications of the Region I dioxin Special Analytical Services (SAS) that are not a standard part of method 8290 will be met. In addition, the lab was requested to modify the method if the result is above the standard calibration range of the method. This is to be accomplished by following section 7.9.3.1 of method 8290 exclusive of option 2 (reducing the mass to be extracted). The estimated detection limits are 1 nanogram per kilogram (ng/kg) for the tetra and penta congeners, 2.5 ng/kg for the hexa and hepta congeners, and 5 ng/kg for the octa congeners.

All concentrations will be based on dry weight and be expressed as toxic equivalents (TEQ) of 2,3,7,8-TCDD.

3.3 Sampling Equipment Decontamination

The following sampling equipment decontamination procedure was employed prior and subsequent to sampling each location in the following numerical sequence:

1 physical removal
2 nonphosphate detergent wash (Liquinox)
3 potable water rinse
4 distilled/deionized water rinse
5 hexane
6 air dry

Liquid waste was collected in plastic 5-gallon buckets and disposed of by U.S. EPA Region I.

3.4 Standard Operating Procedures

3.4.1 Sample Documentation

Sample documentation was completed per the following Environmental Response Team (ERTC)/Response Engineering and Analytical Contract (REAC) Standard Operating Procedures (SOPs):

- ERTC/REAC SOP #2002, *Sample Documentation*
- ERTC/REAC SOP #4005, *Chain of Custody Procedures*

3.4.2 Sample Packaging and Shipment

Sample packaging and shipment were conducted in accordance with the following ERTC/REAC SOP:

- ERTC/REAC SOP #2004, *Sample Packaging and Shipment*

3.4.3 Sampling Techniques

Field activities were conducted in accordance with the following SOPs:

- ERTC/REAC SOP #2012, *Soil Sampling.*

3.5 Waste Disposal

Investigative derived waste (personal protective equipment, paper towels, etc.) were decontaminated, bagged, and disposed of as non-hazardous waste. Liquid waste was collected in plastic 5-gallon buckets and disposed of by U.S. EPA Region I. All of the treated and untreated samples will be maintained for 60 days after the issuance of the final report. If no additional testing has been requested at the end of the 60 days, with the approval and concurrence of the Task Leader, arrangements will be made for disposal.

4.0 PROJECT SCHEDULE

The Quality Assurance Work Plan (QAWP) was initiated in January 1999. The field work outlined in the QAWP was conducted in 15-18 February 1999 and the overall project is expected to close out with the issuance of a final report approximately 7 weeks following the completion of sampling.

5.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The REAC Task Leader/Quality Control (QC) Coordinator (Barry L. Forsythe II) is the primary REAC point of contact with the U.S. EPA Work Assignment Manager. The Task Leader is responsible for the development and completion of the QAWP, project team organization, and supervision of all project tasks, including reports and deliverables. In addition, the QC Coordinator is responsible for ensuring field adherence to the QAWP and recording any deviations from the QAWP.

The following REAC field sampling personnel will work on this project:

Personnel	Responsibility
Barry L. Forsythe II	Task Leader, Final Report Preparation
Al Lupiano	Field Collection/Site Health & Safety Coordinator
Amanda Daly	Field Collection
George Molnar	Field Collection
Brian Holderness	Field Collection
Michele Chipaloski	Sample Management
Elsa Matos	Sample Management
Noel Rogers	Geophysical Survey (EM-1 & magnetometer)
Tim Blum	GIS/Mapping
John Johnson	Subcontracting Support
Donna Getty	Statistical Support

The REAC QA Officer is Edward McGovern, the Health and Safety Officer is Christina Jones, the Operations Section Leader is Edward F. Gilardi, and the Analytical Section Leader is Vinod Kansal. These individuals are responsible for auditing and guiding the project team, reviewing/auditing the deliverables and proposing corrective action, if necessary, for nonconformity to the QAWP or Health and Safety Plan (HASP).

While not specifically identified, activities such as electronic technical data documentation, video documentation, photodocumentation, computer graphics and support, statistics, word processing, report preparation, and purchasing support may be required in order to accomplish the objectives of this project.

The following identified laboratories provided the listed on-site analyses:

Lab Name	Location	Parameters
REAC Engineering Laboratory	Edison, NJ	Geophysical Survey (EM-1 and magnetometer)

The following laboratory/vendor provided these off-site analyses:

Lab Name	Location	Parameters
Triangle Laboratories	Durham, NC	Dioxin/Furans

6.0 LITERATURE CITED

Response, Engineering, and Analytical Contract (REAC). 1999. *Final Analytical Report: Centredale Manor (Woonasquatucket River) Site, North Providence, Rhode Island.* (February 22).

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U.S. Environmental Protection Agency (U.S. EPA). 1990. *Quality Assurance/Quality Control Guidance for Removal Activities.* Sampling QA/QC Plan and Data Validation Procedures. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. EPA/540/G-90/004.

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