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**REMOVAL SITE EVALUATION WATER
TREATMENT BUILDING ROOF REPLACEMENT**

03/17/93

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REMOVAL SITE EVALUATION

WATER TREATMENT BUILDING ROOF REPLACEMENT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

U. S. DEPARTMENT OF ENERGY

March, 1993

REMOVAL SITE EVALUATION WATER TREATMENT BUILDING ROOF REPLACEMENT

INTRODUCTION

The Water Treatment Building is used to house the site water supply, chemical feed and filtration systems. The Water Treatment Building was built in the 1950's at the Fernald Environmental Management Project (FEMP) site. The Water Treatment Building is located in the controlled area of the site, southwest of the Boiler Plant.

The Water Treatment Building roof has been in service for 30 years and has deteriorated beyond repair. The Water Treatment Building Roof Replacement project will consist of removing approximately 5,645 sq. ft. of the existing roof construction required to accommodate new construction including urethane spray insulation and covering, roof drain assemblies, wood nailers, sheet metal work and related items at roof penetrations and expansion joints. Also includes the installation of a single ply roofing, additional drains, flashing, sheet metal and wood nailers.

This Removal Site Evaluation (RSE) has been completed by the Department of Energy under authorities delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). This RSE addresses the construction project involving removal and replacement of the Water Treatment Building roof and has been completed to support the decision as to whether the project conditions warrant a removal action.

SOURCE TERM

Field investigations, including surface samples, confirmed that the roof of the Water Treatment Building is contaminated from deposition of uranium. The attached Figure 1 and Table 1 included within the next section identifies the location at which the samples were taken (Attachment I). Concentrations of total uranium in discrete samples collected from the roof ranged from 83 to 834 ppm (activity concentration range of <55 to 556 pCi/g). The source of contamination would be due to the release of airborne particulates from production operations during uranium processing.

Other than radiological contamination the roofing material contains hazardous constituents although they are classified as non-RCRA, excepting the lead flashing which is RCRA hazardous and will be treated as such. The siding on the building contains asbestos and approximately 300 pounds will be removed. The TCLP analytical results are shown in Attachment II. These samples were taken of the roofing material.

As indicated in Attachment II, all TCLP analyses of the roofing material were below the instrument detection level with the exception of barium, chromium, lead, and m,p-cresol. These constituents were detected, but not in quantities exceeding the RCRA regulatory limits which were established based on the toxicity of the regulated material to protect human health and the environment. Since the

concentrations of these regulated constituents do not exceed these protective limits, the threat created by a release from this material is very small. The threat is even further reduced when the site control procedures discussed below are implemented. At this point, the threat of a toxic materials release from this project becomes negligible.

EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

The only potentially significant threat posed by the actions detailed in this RSE is from uranium found on the Water Treatment Building roof. The potential exposure could result from the suspension of particles in the atmosphere and the potential migration of the contaminants through wind and water run off during the demolition of the existing roof. Although lead is also a contaminant of concern, it presents little risk to human health and the environment due to its chemical and physical form and quantity. Similarly, migration of asbestos contaminants presents little potential risk due to the control measures which will be followed when removing the transite.

All demolition activity will be controlled by FEMP Site Standard Operating Procedure SSOP-0044, "Management of Soil, Debris, and Waste From a Project" and Phase I of RA 17 "Improved Storage of Soil and Debris". All construction rubble will be monitored for radioactivity to determine if can be classified for free release or must be shipped to NTS. In order to minimize the threat of worker exposure and the threat of airborne particulate release to the atmosphere, the following measures will be used:

1. Physical barriers around the work area. The subcontractor will submit for approval how all fugitive emissions will be contained.
2. Protective clothing/filtered face mask for workers, as required by IRS&T.
3. Radiation monitoring during demolition process and placing rubble in waste containers. The waste containers will be placed on plastic/herculite.
4. Portable vacuum equipped with HEPA filter at the work point during demolition process.
5. Asbestos procedures will be followed when removing any transite siding.

The lead flashing used in the roof construction is regulated by RCRA and consists of approximately 1800 pounds of lead. A material evaluation form (MEF) will be written for the lead. It will be appropriately containerized after removal and stored in the RCRA warehouse. In accordance with Removal Action 17, if the lead is not radiologically contaminated or can be successfully decontaminated attempts will be made to recycle the material.

The following table presents the data for radiological analytical results of samples collected from the roof. Attachment I further identifies sample locations.

Table 1

| Sample No. | Uranium Concentration (ppm) |
|---------------|-----------------------------------|
| 91-059-2894 | 83 |
| 91-060-2895 | 197 |
| 91-060-2896 | 728 |
| 91-059-2897 | 103 |
| 91-059-2898 | 834 |

The demolition of the roof in the controlled area of the facility has a potential environmental insult. Introducing control measures to be used during demolition will minimize the potential threat to the environment or public.

ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the NCP, the Department of Energy shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b)(2). The following apply specifically to the Water Treatment Building Roof:

40 CFR 300.415 (b)(2)(i)

Actual or potential exposure to hazardous substances or pollutants or contaminants to nearby populations, animals, or food chain.

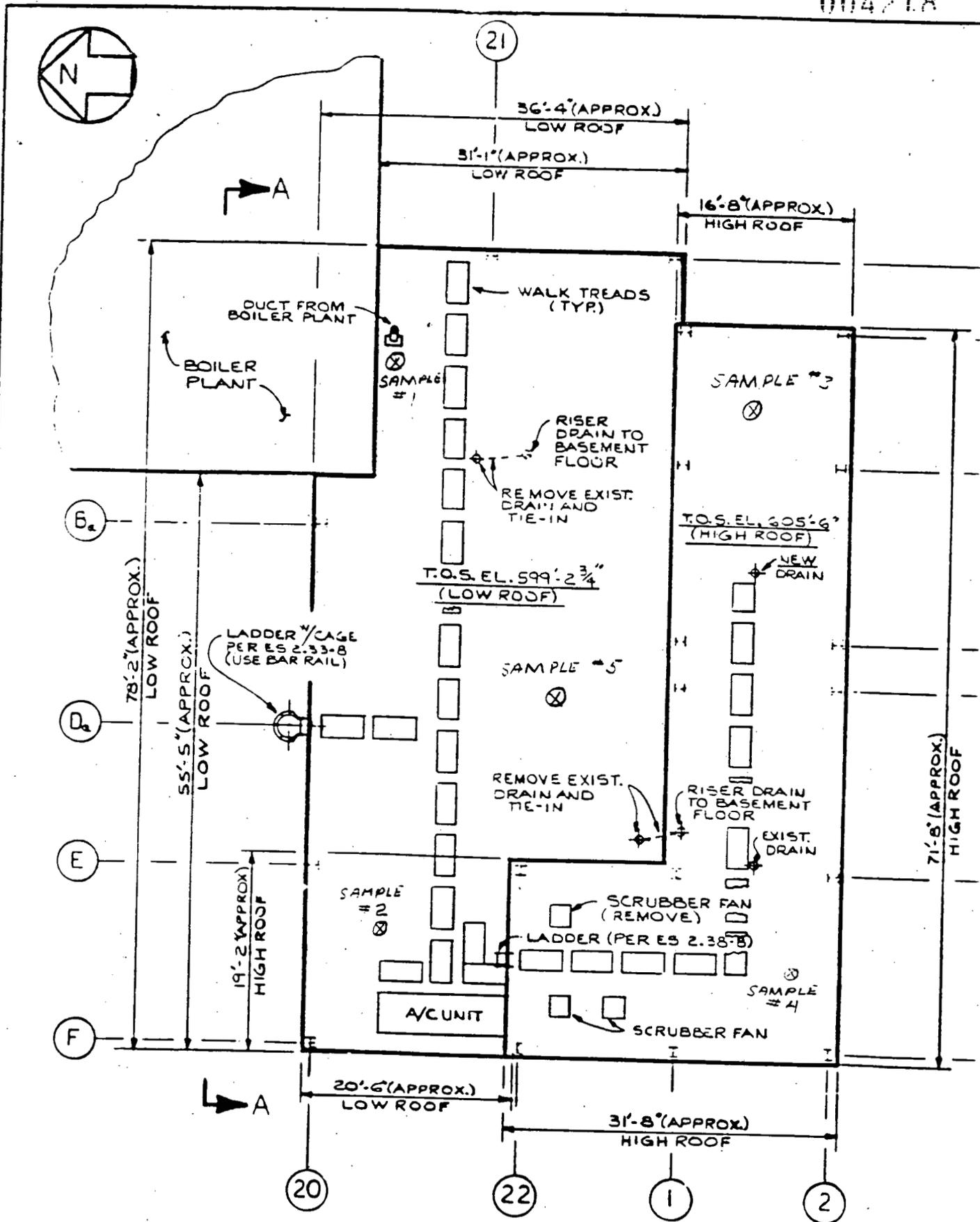
40 CFR 300.415 (b)(2)(v)

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Based on the controls discussed previously, the potential of a release or migration of contaminants from the project site is negligible. Therefore, while the above criteria can be applied to this project, it does not constitute the need for a removal action.

APPROPRIATENESS OF A RESPONSE

Based on the evaluation of all the above factors, it has been determined that a removal action will not be necessary and this project should be continued as a maintenance activity in support of the CERCLA remediation process and waste management. Furthermore, the controls planned in conjunction with this construction activity are adequate to mitigate any hazards created by contamination at the site and to prevent deterioration of existing site conditions.



PLAN
SCALE 1/8"=1'-0"

LOCATE LADDER TO SUIT

SCRUBBER FANS NOT SHOWN

T.O.S. EL. 605'-6" (HIGH ROOF)

A/C UNIT

WESTINGHOUSE MATERIALS COMPANY OF OHIO

P.O. BOX 398704, CINCINNATI, OHIO 45239-8704

Control #: _____ Pg | 01 |

ANALYSIS REQUEST / CUSTODY RECORD

PROJECT: ROOFING PROS. WATER TREATMENT CLIENT: SITE MEDIA Sampling TECHNICIAN/EXT.: D. BACK 6727
 PROJECT #: 208-91301 CLIENT CONTACT: J. LOVE CHARGE # SGA.00
 PEPM: S. LUND PHONE: 6727 LOT MARK CODE: N/A

SAMPLE IDENTIFICATION

ANALYSIS REQUESTED
SEE REVERSE FOR PARAMETERS

| SAMPLE NUMBER | CUSTOMER NUMBER | DESCRIPTION | MATRIX | DATE/TIME COLLECTED | CONTAINER/PRESERVATIVE | # CONT./VOLUME | TABLE | | | | | | | | |
|---------------|-----------------|----------------|--------|---------------------|---------------------------|----------------------|-------|---|---|---|---|---|--|---|--|
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| 91-057-2857 | 010801-040 | SP. TRIP BLANK | L19010 | 08/01/91 0940 | GUN'S W/REL 2000 TO 42 | 2 LITERS 3-4oz | X | | | | | | | | |
| 91-057-2858 | 041 | SP. FIELD BANK | L19010 | 7445 | | 2 LITERS 1-4oz | X | | | | | | | X | |
| 91-057-2894 | 042 | SP. 1 | S010 | 1000 | | 3-4oz 3-4oz | X | | | | | | | X | |
| 8595 | 045 | SP-2 | | 1045 | | 3. P.P.T.S 5. 4oz | X | | | | | | | X | |
| 2896 | 044 | SP-3 | | 1010 | | | X | | | | | | | Y | |
| 2897 | 045 | SP-4 | | 1020 | | | X | | | | | | | X | |
| 2898 | 046 | SP-5 | | 1025 | | | X | | | | | | | X | |
| 8141 | | | | 08/01/91 | | | X | | | | | | | X | |

Copy To: (2 COPIES) TO S. LUND, L. LOVE

| ITEM/REASON | RELINQUISHED BY | RECEIVED BY | DATE | TIME | ITEM/REASON | RELINQUISHED BY | RECEIVED BY | DATE | TIME |
|-------------|-----------------|-------------|--------|-------|-------------|-----------------|-------------|------|------|
| 8/1/91 | | | 8-1-91 | 14:52 | | | | | |
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WEMCO PO: 413910
 Release No.: 722
 Date: September 5, 1991

TABLE 1

ANALYTICAL RESULTS FOR SAMPLES

| | TRIP BLANK | FIELD BLANK | SAMPLE #1 | SAMPL #2 |
|------------------|---------------|----------------|--------------|-------------|
| WEMCO ID: | 910801-040 | 910801-041 | 910801-042 | 910801 |
| CNLSI No.: | 911766 | 911767 | 911768 | 911769 |
| Original Matrix: | Liquid | Liquid | Solid | Solid |
| <u>Units:</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |

Toxicity Characteristics Leaching Procedure

| | | | | |
|----------|--------|--------|--------|--------|
| Arsenic | <0.02 | <0.02 | 0.92 | <0.03 |
| Barium | <0.01 | <0.01 | 0.88 | 0.33 |
| Cadmium | <0.01 | <0.01 | <0.10 | <0.10 |
| Chromium | <0.03 | <0.03 | 0.83 | 0.87 |
| Lead | <0.07 | <0.07 | 4.77 | <0.70 |
| Mercury | <0.003 | <0.003 | <0.003 | <0.003 |
| Selenium | <0.01 | <0.01 | 0.22 | <0.02 |
| Silver | <0.01 | <0.01 | <0.10 | <0.10 |

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TABLE 1

ANALYTICAL RESULTS FOR SAMPLES

| | SAMPLE #3 | SAMPLE #4 | SAMPLE #5 |
|------------------|--------------|--------------|--------------|
| WEMCO ID: | 910801-044 | 910801-045 | 910801-046 |
| CNLSI No.: | 911770 | 911771 | 911772 |
| Original Matrix: | Solid | Solid | Solid |
| <u>Units:</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |

Toxicity Characteristics Leaching Procedure

| | | | |
|----------|--------|--------|--------|
| Arsenic | <0.03 | <0.03 | <0.06 |
| Barium | 0.37 | 0.28 | 0.33 |
| Cadmium | <0.10 | <0.10 | <0.10 |
| Chromium | 0.36 | 0.87 | 1.00 |
| Lead | <0.70 | 0.79 | <0.70 |
| Mercury | <0.003 | <0.003 | <0.003 |
| Selenium | <0.02 | <0.02 | <0.03 |
| Silver | <0.10 | <0.10 | 0.10 |

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TABLE 2

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-040 | 910801-041 | 910801-042 | 910801- |
|------------------|------------|------------|------------|------------|
| CNLSI NO.: | 911766 | 911767 | 911768 | 911769 |
| Original Matrix: | Liquid | Liquid | Solid | Solid |
| Units: | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |

TCLP/ZHE Volatile Organics:

| | | | | |
|----------------------|-------|-------|-------|-------|
| Vinyl Chloride | <0.15 | <0.15 | <0.15 | <0.15 |
| 1,1-Dichloroethylene | <0.12 | <0.12 | <0.12 | <0.12 |
| 2-Butanone (MEK) | <0.25 | <0.25 | <0.25 | <0.25 |
| Chloroform | <0.12 | <0.12 | <0.12 | <0.12 |
| Carbon Tetrachloride | <0.15 | <0.15 | <0.15 | <0.15 |
| Benzene | <0.09 | <0.09 | <0.09 | <0.09 |
| 1,2-Dichloroethane | <0.10 | <0.10 | <0.10 | <0.10 |
| Trichloroethylene | <0.22 | <0.22 | <0.22 | <0.22 |
| Chlorobenzene | <0.19 | <0.19 | <0.19 | <0.19 |
| Tetrachloroethylene | <0.50 | <0.50 | <0.50 | <0.50 |
| 1,4-Dichlorobenzene | <0.35 | <0.35 | <0.35 | <0.35 |

Surrogates: (% Recovery)

| | | | | |
|-----------------------|----|-----|-----|----|
| 1,2-Dichloroethane-d4 | 98 | 106 | 93 | 88 |
| Toluene-d8 | 97 | 103 | 95 | 96 |
| Bromofluorobenzene | 96 | 103 | 102 | 92 |

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TABLE 2

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-044 | 910801-045 | 910801-046 |
|------------------|------------|------------|------------|
| CNLSI NO.: | 911770 | 911771 | 911772 |
| Original Matrix: | Solid | Solid | Solid |
| Units: | ppm | ppm | ppm |

TCLP/ZHE Volatile Organics:

| | | | |
|----------------------|-------|-------|-------|
| Vinyl Chloride | <0.15 | <0.15 | <0.15 |
| 1,1-Dichloroethylene | <0.12 | <0.12 | <0.12 |
| 2-Butanone (MEK) | <0.25 | <0.25 | <0.25 |
| Chloroform | <0.12 | <0.12 | <0.12 |
| Carbon Tetrachloride | <0.15 | <0.15 | <0.15 |
| Benzene | <0.09 | <0.09 | <0.09 |
| 1,2-Dichloroethane | <0.10 | <0.10 | <0.10 |
| Trichloroethylene | <0.22 | <0.22 | <0.22 |
| Chlorobenzene | <0.19 | <0.19 | <0.19 |
| Tetrachloroethylene | <0.50 | <0.50 | <0.50 |
| 1,4-Dichlorobenzene | <0.35 | <0.35 | <0.35 |

Surrogates: (% Recovery)

| | | | |
|-----------------------|-----|----|-----|
| 1,2-Dichloroethane-d4 | 94 | 90 | 97 |
| Toluene-d8 | 100 | 97 | 105 |
| Bromofluorobenzene | 97 | 95 | 106 |

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TABLE 3

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-040 | 910801-041 | 910801-042 | 910801 |
|------------------|------------|------------|------------|------------|
| CNLSI NO.: | 911766 | 911767 | 911768 | 911769 |
| Original Matrix: | Liquid | Liquid | Solid | Solid |
| <u>Units:</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |

TCLP Semi-Volatile Organics:

| | | | | |
|-----------------------|-------|-------|-------|------|
| Pyridine | <0.08 | <0.08 | <0.08 | <0.0 |
| o-Cresol | <0.04 | <0.04 | <0.04 | <0.0 |
| Hexachloroethane | <0.04 | <0.04 | <0.04 | <0.0 |
| m.p-Cresol | <0.04 | <0.04 | <0.04 | <0.0 |
| Nitrobenzene | <0.04 | <0.04 | <0.04 | <0.0 |
| Hexachlorobutadiene | <0.04 | <0.04 | <0.04 | <0.0 |
| 2,4,6-Trichlorophenol | <0.04 | <0.04 | <0.04 | <0.0 |
| 2,4,5-Trichlorophenol | <0.04 | <0.04 | <0.04 | <0.0 |
| 2,4-Dinitrotoluene | <0.04 | <0.04 | <0.04 | <0.0 |
| Hexachlorobenzene | <0.04 | <0.04 | <0.04 | <0.0 |
| Pentachlorophenol | <0.04 | <0.04 | <0.04 | <0.0 |

Surrogates: (% Recovery)

| | | | | |
|----------------------|-----|-----|-----|----|
| 2-Fluorophenol | 70 | 48 | 65 | 64 |
| Phenol-d6 | 74 | 53 | 67 | 70 |
| Nitrobenzene-d5 | 74 | 52 | 73 | 73 |
| 2-Fluorobiphenyl | 92 | 70 | 87 | 86 |
| 2,4,6-Tribromophenol | 83 | 79 | 79 | 76 |
| Terphenyl-d14 | 106 | 114 | 112 | 93 |

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TABLE 3

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-044 | 910801-045 | 910801-046 |
|-------------------------------------|------------|------------|------------|
| CNLSI NO.: | 911770 | 911771 | 911772 |
| Original Matrix: | Solid | Solid | Solid |
| Units: | ppm | ppm | ppm |
| <u>TCLP Semi-Volatile Organics:</u> | | | |
| Pyridine | <0.08 | <0.08 | <0.08 |
| o-Cresol | <0.04 | <0.04 | <0.04 |
| Hexachloroethane | <0.04 | <0.04 | <0.04 |
| m,p-Cresol | 0.07 | 0.11 | 0.07 |
| Nitrobenzene | <0.04 | <0.04 | <0.04 |
| Hexachlorobutadiene | <0.04 | <0.04 | <0.04 |
| 2,4,6-Trichlorophenol | <0.04 | <0.04 | <0.04 |
| 2,4,5-Trichlorophenol | <0.04 | <0.04 | <0.04 |
| 2,4-Dinitrotoluene | <0.04 | <0.04 | <0.04 |
| Hexachlorobenzene | <0.04 | <0.04 | <0.04 |
| Pentachlorophenol | <0.04 | <0.04 | <0.04 |
| <u>Surrogates: (% Recovery)</u> | | | |
| 2-Fluorophenol | 49 | 56 | 55 |
| Phenol-d6 | 55 | 60 | 59 |
| Nitrobenzene-d5 | 54 | 64 | 60 |
| 2-Fluorobiphenyl | 68 | 78 | 77 |
| 2,4,6-Tribromophenol | 96 | 105 | 87 |
| Terphenyl-d14 | 109 | 114 | 109 |

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TABLE 4

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-040 | 910801-041 | 910801-042 | 910801-0 |
|--------------------------------|------------|------------|------------|----------|
| CNLSI NO.: | 911766 | 911767 | 911768 | 911769 |
| Original Matrix: | Liquid | Liquid | Solid | Solid |
| Units: | ppm | ppm | ppm | ppm |
| <u>TCLP Pesticides:</u> | | | | |
| Endrin | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Heptachlor | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Heptachlor Epoxide | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Lindane | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Chlordane | <0.004 | <0.004 | <0.004 | <0.004 |
| Methoxychlor | <0.0004 | <0.0004 | <0.0004 | <0.0004 |
| Toxaphene | <0.02 | <0.02 | <0.02 | <0.02 |
| <u>Surrogate: (% Recovery)</u> | | | | |
| Dibutylchlorodate | 119 | 120 | 122 | 133 |
| Tetrachloro-m-xylene | 101 | 82 | 100 | 101 |

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TABLE 4

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-044 | 910801-045 | 910801-046 |
|--------------------------------|------------|------------|------------|
| CNLSI NO.: | 911770 | 911771 | 911772 |
| Original Matrix: | Solid | Solid | Solid |
| <u>Units:</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |
| <u>TCLP Pesticides:</u> | | | |
| Endrin | <0.0004 | <0.0004 | <0.0004 |
| Heptachlor | <0.0004 | <0.0004 | <0.0004 |
| Heptachlor Epoxide | <0.0004 | <0.0004 | <0.0004 |
| Lindane | <0.0004 | <0.0004 | <0.0004 |
| Chlordane | <0.004 | <0.004 | <0.004 |
| Methoxychlor | <0.0004 | <0.0004 | <0.0004 |
| Toxaphene | <0.02 | <0.02 | <0.02 |
| <u>Surrogate: (% Recovery)</u> | | | |
| Dibutylchloroendate | 131 | 144 | 142 |
| Tetrachloro-m-xylene | 87 | 119 | 106 |

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TABLE 5

ANALYTICAL RESULTS FOR SAMPLES

| WEMCO ID: | 910801-040 | 910801-041 | 910801-042 | 910801 |
|--------------------------------|------------|------------|------------|--------|
| CNLSI NO.: | 911766 | 911767 | 911768 | 911769 |
| Original Matrix: | Liquid | Liquid | Solid | Solid |
| <u>Units:</u> | ppm | ppm | ppm | ppm |
| <u>TCLP Herbicides:</u> | | | | |
| 2,4-D | <0.001 | <0.001 | <0.001 | <0.001 |
| Silvex | <0.001 | <0.001 | <0.001 | <0.001 |
| <u>Surrogate: (% Recovery)</u> | | | | |
| Dichloroprop | 105 | 97 | 114 | 135 |

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TABLE 5

ANALYTICAL RESULTS FOR SAMPLES

| | | | |
|------------------|------------|------------|------------|
| WEMCO ID: | 910801-044 | 910801-045 | 910801-046 |
| CNLSI NO.: | 911770 | 911771 | 911772 |
| Original Matrix: | Solid | Solid | Solid |
| <u>Units:</u> | <u>ppm</u> | <u>ppm</u> | <u>ppm</u> |

TCLP Herbicides:

| | | | |
|--------|--------|--------|--------|
| 2,4-D | <0.001 | <0.001 | <0.001 |
| Silvex | <0.001 | <0.001 | <0.001 |

Surrogate: (% Recovery)

| | | | |
|--------------|-----|-----|-----|
| Dichloroprop | 154 | 108 | 128 |
|--------------|-----|-----|-----|