TECHNICAL REPORT

Addendum Remedial Investigation Report Soil Investigations Adjacent to Outfall 003

Farrell Road Plant
Geddes, New York
NYSDEC Site No. 734055

Lockheed Martin Corporation
Syracuse, New York

August 1996

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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Syracuse, New York, 13214-0066
(315) 446-9120

Table of Contents

1. Introduction

1.1 General

This addendum to the Remedial Investigation (RI) Report documents additional soil investigations completed adjacent to Outfall 003 at the above-referenced site. These additional investigations were completed subsequent to the RI and in accordance with recommendations presented in the New York State Department of Environmental Conservation (NYSDEC) approved RI Report.

Effective January 29, 1996, Martin Marietta Corporation (MMC) merged into its parent corporation, Lockheed Martin Corporation (LMC). LMC is the successor by merger to MMC. In this RI Report Addendum, for convenience, we refer only to LMC, although prior to January 29, 1996, MMC performed soil investigations adjacent to Outfall 003 and provided related documentation to NYSDEC.

This RI Report Addendum presents the results of the additional investigations completed adjacent to Outfall 003, presents recommendations based on those results, and includes the following information:

- An overview of the investigations completed at Outfall 003, including Lockheed Martin Corporation's (LMC's) recommendation to address impacted soil;
- A chronological summary of correspondence between the NYSDEC and LMC regarding Outfall 003;
- A tabular summary of PCB analytical data generated during the RI and the additional investigations completed adjacent to Outfall 003;
- A partial site plan, which delineates the extent of impacted soil and presents the PCB analytical data; and
- Copies of the correspondence between the NYSDEC and LMC regarding Outfall 003.

The RI and additional investigations completed adjacent to Outfall 003 are described briefly below, followed by a chronological summary of correspondence between the NYSDEC and LMC.

1.2 Overview

Surficial and subsurface (one-foot depth) soil samples were collected at Outfall 003, as well as at other storm sewer outfalls, during the RI field activities conducted in March 1994. The soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs) and inorganics. The results of the laboratory analyses indicated that the soils at the discharge location of Outfall 003 contained VOCs, SVOCs, pesticides, PCBs, and inorganics. Based on the identified concentration of PCBs, the RI Report recommended that additional investigations be conducted adjacent to Outfall 003 to define the extent of soil affected by PCBs. With NYSDEC approval, LMC conducted two additional sampling and analysis programs within the area adjacent to Outfall 003; the results of these sampling and analysis programs have been used to estimate the horizontal and vertical extent of PCB-impacted soil. LMC has proposed to address the impacted soils as an Interim Remedial Measure (IRM), which will include the removal and off-site disposal of affected soils, and site restoration. An IRM Work Plan has been approved by the NYSDEC; LMC expects to complete the IRM in August 1996.

2. Additional Investigations

2.1 Summary of Additional Investigation: Soils Adjacent to Outfall 003

The RI identified PCBs at concentrations up to 2.9 parts per million (ppm) in soil samples collected adjacent to Outfall 003. Based on these findings, the RI Report recommended that additional sampling and analysis be conducted to estimate the extent of PCBs near Outfall 003.

In a February 21, 1995 letter to LMC (Attachment 1), the NYSDEC requested that LMC complete the additional sampling in the area adjacent to Outfall 003, as recommended in the RI Report. In response to the NYSDEC's request, LMC presented a sampling program to the NYSDEC in a March 21, 1995 letter (Attachment 2); the proposed sampling program was approved by the NYSDEC in a March 28, 1995 letter to LMC (Attachment 3). In an April 3, 1995 letter to NYSDEC (Attachment 4), LMC agreed to collect one additional soil sample as requested in NYSDEC's March 28, 1995 letter. The proposed sampling and analysis, completed on March 30, 1995, included the collection and analysis of seven soil samples from five locations (sample locations OF-003, S-1, S-2, S-3, and S-4) within the Outfall 003 drainage swale (Figure 1). The results of this sampling and analysis program indicated that PCBs were present in the near-surface soils, but that shallow subsurface soils (up to 1.5 feet deep) within the drainage swale were not affected. The results of this sampling and analysis program were presented in a July 5, 1995 letter to the NYSDEC (Attachment 5); the analytical data are presented on Table 1. Based on the results of this investigation, LMC recommended that additional investigations be conducted using field screening techniques (i.e., immunoassay field screening) to define the lateral extent of PCB-affected soil. The scope of the recommended additional investigations was presented in LMC's July 5, 1995 letter to the NYSDEC. In an August 7, 1995 letter to LMC (Attachment 6), the NYSDEC issued comments on the proposed sampling plan and provided conditional approval of the plan pending incorporation of the NYSDEC's comments. The NYSDEC's comments were addressed in LMC's August 23, 1995 letter to the NYSDEC (Attachment 7).

In accordance with the work plan, 27 surface soil samples (0-0.5 feet deep) were collected in a 25-foot grid adjacent to Outfall 003 (Figure 1). The collected soils were screened in the field for relative PCB concentrations using Ensys, Inc. immunoassay field screening kits. In addition, seven duplicate samples were submitted to Adirondack Environmental Services, Inc. for confirmatory PCB analysis by USEPA Method 8080, and one sample was analyzed for total organic carbon (TOC) content. The results of this sampling program are detailed in LMC's initial "RI Report Addendum for Soil Sampling in the Wetlands Adjacent to Outfall 003," dated November 27, 1995 and submitted under cover of a November 29, 1995 letter to the NYSDEC (Attachment 8). Based on the results of this and previous sampling programs conducted adjacent to Outfall 003, LMC delineated an area of soil that contained PCBs in excess of one ppm. Because the locations of PCB detection did not indicate a directional trend, and because the Aroclors detected at the outfall discharge were different from those detected at a distance from the Outfall 003 discharge (Aroclors 1254 and 1260 versus Aroclors 1242 and 1248), the initial RI Report Addendum suggested that the presence of PCBs in the wetland area may be related to a source other than the GE Farrell Road Site, such as periodic flooding of the Seneca River. The initial RI Report Addendum recommended that a site-specific cleanup objective for PCBs be developed through the Feasibility Study (FS) process, based on the cleanup objectives presented in the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046.

In a January 19, 1996 letter to LMC (Attachment 9), the NYSDEC issued comments regarding the November 27, 1995 RI Report Addendum. The primary issue presented in the NYSDEC's comment letter related to cleanup objectives for PCB-impacted soil in the wetland area. The NYSDEC indicated that the use of TAGM 4046 to develop cleanup objectives is not appropriate for the wetland area, because the cleanup objectives in TAGM 4046 are based upon protection of human health and ground water, and as such cannot be considered to be protective of fish and wildlife.

The NYSDEC indicated that the NYSDEC Technical Guidance for Screening Contaminated Sediments was more appropriate and should be considered. The NYSDEC also disagreed with LMC's statement that the presence of Aroclors 1242 and 1248 may be related to another source. In a February 29, 1996 response to the NYSDEC's January 19, 1996 letter (Attachment 10), LMC asserted that the wetland area impacted by PCBs is comprised of soils, not sediment; therefore, the sediment screening guidance is not applicable. LMC further questioned whether the remediation efforts for soils in the wetland adjacent to Outfall 003 could achieve a cleanup level of one ppm (as presented in TAGM 4046) or less, due to the nature of the wetland (limited accessibility and wooded vegetation) without significant adverse environmental impact. LMC indicated that remediation of soil containing PCBs in concentrations greater than one ppm within the wetland adjacent to Outfall 003 would be considered in the FS. LMC believes that the source of Aroclors 1242 and 1248 is unknown, and that LMC's and NYSDEC's different explanations for the presence of those Aroclors are equally probable.

On March 12, 1996, representatives of LMC and the NYSDEC met to discuss the on-going RI/FS at the site. During those discussions, the NYSDEC proposed that the extent of remediation required in the wetland adjacent to Outfall 003 be determined by area, rather than by cleanup objectives. This discussion was documented in March 29, 1996 and April 1, 1996 letters (Attachment 11) to LMC. In this correspondence, the NYSDEC presented proposed remediation boundaries and indicated that the NYSDEC believes that the top one foot of soil could be removed from between mature trees with minimal harm to the wetland. The NYSDEC also restated its position that the media sampled within the wetland should be characterized as sediment, not soil.

In a May 2, 1996 letter (Attachment 12), LMC submitted responses to the NYSDEC's March 29, 1996 letter. In this letter, LMC concurred with the NYSDEC that defining the extent of remediation for soils adjacent to Outfall 003 by area rather than by cleanup objectives is an effective remedial approach. LMC also agreed to remediate the area defined by the NYSDEC, although the area is significantly larger than the area previously defined by LMC. LMC proposed to complete the soil remediation as an IRM and presented a conceptual work description for the NYSDEC's consideration. In this letter, LMC reiterated the position that the media adjacent to Outfall 003 is soil, not sediment, but that resolution of this issue is not needed to proceed with the remediation.

In a June 28, 1996 letter to LMC (Attachment 13), the NYSDEC agreed with LMC's proposal to proceed with the remediation of soils adjacent to Outfall 003 as an IRM rather than considering this remediation in the FS. NYSDEC also indicated that while the NYSDEC and LMC continue to disagree on the source of PCBs and the classification of the media as soil or sediment, that resolution of these issues is not necessary to proceed with the IRM. The NYSDEC also provided several comments regarding the conceptual work description. LMC submitted an *Outfall 003 IRM Work Plan* (IRM Work Plan) to the NYSDEC on July 25, 1996 (Attachment 14). The NYSDEC issued comments regarding the IRM Work Plan, and conditional approval of the IRM Work Plan pending incorporation of the NYSDEC's comments, in a letter dated August 2, 1996 (Attachment 15). The NYSDEC's comments were addressed in an August 5, 1996 letter to NYSDEC (Attachment 16). NYSDEC approval of the IRM Work Plan was issued in an August 6, 1996 letter to LMC (Attachment 17). In an August 8, 1996 letter to the NYSDEC (Attachment 18), an additional modification to the IRM Work Plan was agreed to by LMC. LMC expects to complete the IRM during August 1996. In accordance with the IRM Work Plan, a certification report documenting the completed IRM will be prepared and submitted to the NYSDEC following completion of the IRM.

Table 1
Lockheed Martin Corporation
Farrell Road Plant
Remedial Investigation Report Addendum
Soil Investigations Adjacent to Outfall 003

Summary of PCB Data

Sample ID	Sample Date	Laboratory Results (ug/g)	Field Screening Result (ppm)
OF-003 (1.5-2.0)	3/30/95	0.2	NA
S-1 (1.0-1.5)	3/30/95	0.015	NA
S-2 (0.0-0.5)	3/30/95	1.39	NA
S-2 (1.0-1.5)	3/30/95	---	NA
S-3 (0.0-0.5)	3/30/95	0.8	NA
S-3 (0.0-0.5) DUPE	3/30/95	0.88	NA
S-3 (1.0-1.5)	3/30/95	---	NA
S-4 (0.0-0.5)	3/30/95	3	NA
S-5 (0.0-0.5)	9/26/95	NA	<1
S-6 (0.0-0.5)	9/26/95	NA	<1
S-7 (0.0-0.5)	9/26/95	4.2	>4, <40
S-8 (0.0-0.5)	9/26/95	NA	<1
S-9 (0.0-0.5)	9/26/95	---	<1
S-9 (0.0-0.5) DUPE	9/26/95	---	NA
S-10 (0.0-0.5)	9/26/95	NA	<1
S-11 (0.0-0.5)	9/26/95	NA	>1, <10
S-11 (0.0-0.5) DUPE	9/26/95	NA	>1, <10
S-12 (0.0-0.5)	9/26/95	NA	<1
S-13 (0.0-0.5)	9/26/95	NA	<1
S-14 (0.0-0.5)	9/26/95	---	<1
S-15 (0.0-0.5)	9/26/95	NA	<1
S-16 (0.0-0.5)	9/26/95	NA	>1, <10
S-17 (0.0-0.5)	9/26/95	NA	<1

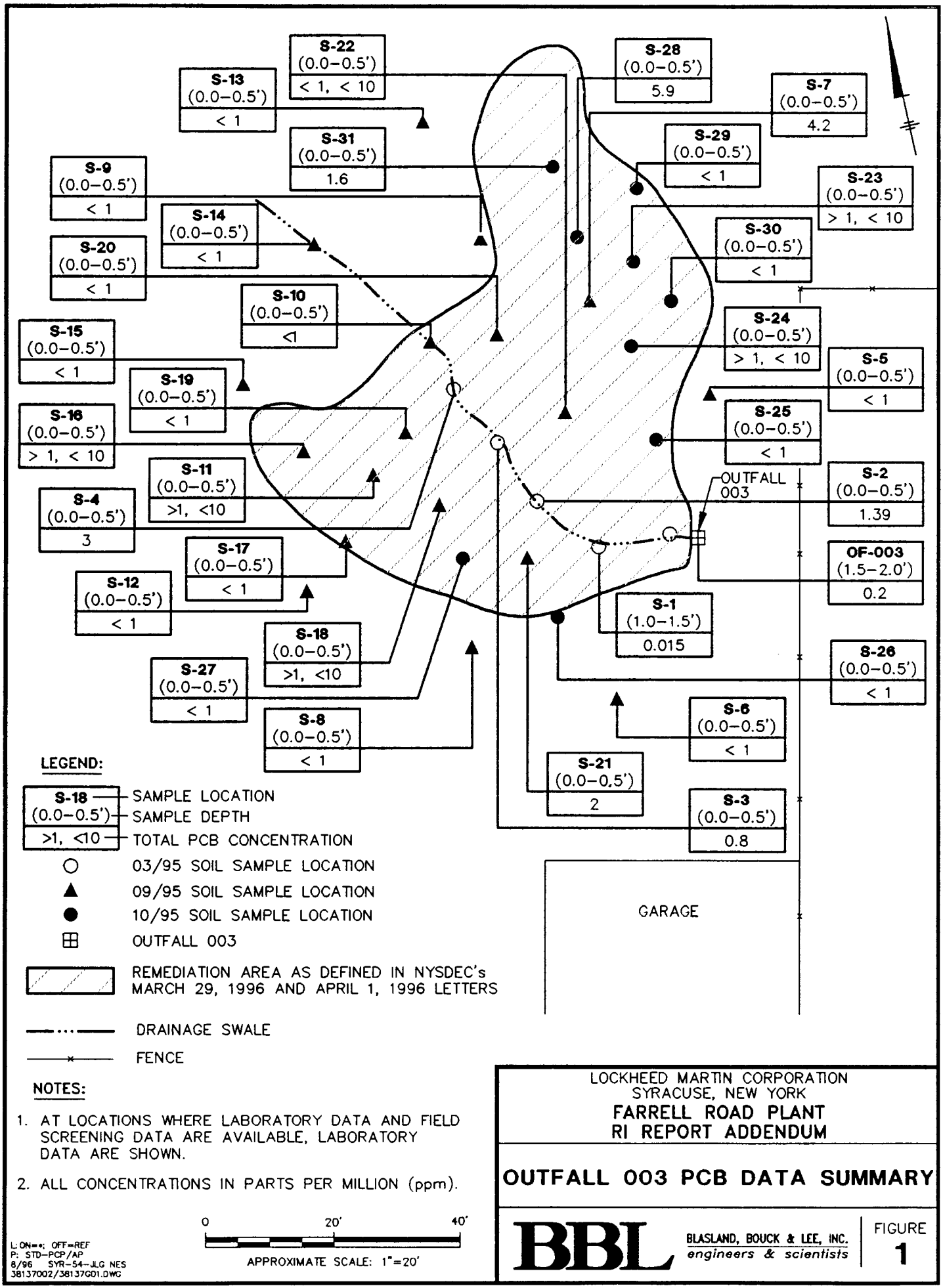
Table 1
(Cont'd)
Lockheed Martin Corporation
Farrell Road Plant
Remedial Investigation Report Addendum
Soil Investigations Adjacent to Outfall 003

Summary of PCB Data

Sample ID	Sample Date	Laboratory Results (ug/g)	Field Screening Result (ppm)
S-18 (0.0-0.5)	9/26/95	NA	>1, <10
S-19 (0.0-0.5)	9/26/95	NA	<1
S-20 (0.0-0.5)	9/26/95	NA	<1
S-21 (0.0-0.5)	9/26/95	2	>2, <20
S-22 (0.0-0.5)	9/26/95	NA	>1, <10
S-23 (0.0-0.5)	10/3/95	NA	>1, <10
S-24 (0.0-0.5)	10/3/95	NA	>1, <10
S-25 (0.0-0.5)	10/3/95	NA	<1
S-26 (0.0-0.5)	10/3/95	NA	<1
S-27 (0.0-0.5)	10/3/95	NA	<1
S-28 (0.0-0.5)	10/3/95	5.9	>2, <20
S-29 (0.0-0.5)	10/3/95	NA	<1
S-29 (0.0-0.5) DUPE	10/3/95	NA	<1
S-30 (0.0-0.5)	10/3/95	NA	<1
S-31 (0.0-0.5)	10/3/95	1.6	<4

Notes:

- ug/g = micrograms-per-gram which are approximately equivalent to ppm = parts-per-million.
- --- = compound not detected above detection limit by laboratory analysis of the sample.
- NA = sample not analyzed by this method.
- Data presents total PCB concentration.



NOTES:

1. AT LOCATIONS WHERE LABORATORY DATA AND FIELD SCREENING DATA ARE AVAILABLE, LABORATORY DATA ARE SHOWN.
2. ALL CONCENTRATIONS IN PARTS PER MILLION (ppm).

0 20' 40'

APPROXIMATE SCALE: 1"=20'

L: ON=•; OFF=REF
P: STD-PCP/AP
8/96 SYR-54-JLG NES
38137002/38137G01.DWG

LOCKHEED MARTIN CORPORATION
SYRACUSE, NEW YORK
FARRELL ROAD PLANT
RI REPORT ADDENDUM

OUTFALL 003 PCB DATA SUMMARY

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1

Attachment 1

Letter from NYSDEC to LMC dated February 21, 1995

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

Langdon Marsh
Commissioner

February 21, 1995

MMC
FEB 23 '95
Environment Health & Safety

Mr. Brian A. Kent
Principal Engineer
Martin Marietta Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Dear Mr. Kent:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have reviewed Martin Marietta Corporation's (MMC) responses to our comments of November 15, 1994, regarding the Remedial Investigation (RI) Report for the GE Farrell Road Site. These responses are approved pending review of the revised pages, with the following exceptions:

1. Comment 4, Integration of previous investigations:

   In Area of Concern (AOC) #2, AOC #10, and in the wetlands, the location of previous borings must be shown. Due to the lack of significant landmarks, it is not possible to accurately relate the locations of the borings performed during various investigations with those installed during the RI.

2. Comment 13b, Groundwater metals analysis:

   After reviewing the well development logs, the DEC does not agree that a reasonable attempt was made to develop the wells. However, the sampling techniques used are acceptable, therefore the DEC will accept the analytical results.

3. Comment 18, PCBs at Outfall #3:

   The PCB samples at outfall #3 should be collected at this time, rather than during predesign, as the information received will have an impact on the FS. Because this

contamination is located in the wetlands, the extent of contamination may impact the alternative selected, to reduce the impact upon the wetlands.

Samples were taken during the RI at the outfall (surface and 1' deep), and 12' out (surface). To define the extent of PCB contamination, we suggest that a sample be collected 12' out from the outfall, at a depth of 1', that samples be collected at 22' and 32' out at the surface and at a depth of 1', and that a surface sample be collected at 42'.

4. Additional information collected during the installation and pilot testing of the SVE and air stripper IRMs at AOCs #5, #7 and #16 needs to be incorporated into the RI, to provide a comprehensive basis for the FS. Specifically, the presence, composition, and extent of Light Nonaqueous Phase Liquid (LNAPL) must be described. If the composition and extent of the LNAPL is not adequately defined, consideration must be given to further investigation to adequately describe the LNAPL for evaluation of alternatives in the FS. In addition, as Ms. Klatt discussed with you during the pilot test, consideration should be given to modifying the current IRM in AOC #5 to include LNAPL removal, as is being performed in AOC #7. Ms. Klatt will contact Pat Salvador in the near future to discuss this matter further.

5. Comment 9, AOC #7:

The DEC agrees that the hydrocarbon contamination in the soil at depths of 10 to 12 feet may be due to LNAPL migration along the surface of the groundwater table near the former UST during high groundwater conditions, or to sorption onto the soil from dissolved phase hydrocarbons. Regardless of the mechanism of transport, however, the hydrocarbons in the soil constitute a continuing source of groundwater contamination. A discussion must be included in Sec. 7.2.6 of the staining and $H\mu$ readings observed when performing the soil borings, and in Sec. 8.2.2 of the analytical results of the Phase II investigation. In addition, the above must be taken into consideration when evaluating alternative remedial alternatives for the soil in Area 7 in the FS.

6. Comment 10, AOC 10:

MMC does not support their conclusions that there is not a source zone in the soil, and that groundwater contaminants in this area results from an upgradient source as opposed to contaminated soils in AOC #10. The DEC still concludes that the data indicates contaminated soils in AOC #10 are contributing to the groundwater contamination, for the reasons discussed in the November 15, 1994 letter. A discussion of the Phase II analytical results and of the groundwater contamination must be included in Sec. 8.2.2.

Additionally, the statement made in Section 11.1.3, that the soil contains analytes of concern below action levels, needs to be corrected.

7. The DEC does not accept the conclusion of the Fish and Wildlife Impact Analysis, that "No adverse impacts . . . are expected to result from chemicals from the site at the present time." Shallow groundwater in the wetland contains concentrations of benzene and trichloroethene exceeding NYSAWQS surface water guidance values. Wetland sediments contain concentrations of PCBs and benzene exceeding DFW sediment criteria. In addition, the wetland groundwater is contaminated with a total of 17 VOCs (RI Table 9-4) and the sediment analytical results showed 6 VOCs (RI Table 9-5) and additive or synergistic effects are likely. Although most of these compounds have no established criteria, it is unreasonable to believe that no risk exists. While this conclusion is implied in the responses to our Comments 11, 14, 16, and 18, Section 9.4 must be revised to include the conclusion that risk may exist at this time.

DNAPL Issue:

The presence of the LNAPL layer in AOC #5 has reinforced our concern that a layer of Dense Nonaqueous Phase Liquid (DNAPL) may be present in this area. EPA guidance ("Dense Nonaqueous Phase Liquids--A Workshop Summary," EPA/600/R-92/030, February 1992) states that groundwater contaminant concentrations of 1% or less of effective solubility can be found even in the effective proximity of the DNAPL, and that concentrations seldom exceed 10% even when DNAPL is known to be present. In AOC 5, the highest concentration of 1,1-TCA in the Phase II investigation was 180 ppm, or 6% of the effective solubility of 2,900 ppm, which indicates that a DNAPL layer is likely. Because of the clay ridge, DNAPL layer could be moving southwest, or opposite to the direction of groundwater flow. Based on a review of boring logs, it appears that none of the borings installed on the south side of the clay ridge in AOC 5 went down to the clay layer, therefore there is no historical data to determine the presence or absence of DNAPL, and additional field work is necessary.

To determine the presence and extent of a DNAPL layer, we suggest using a Hydropunch or equivalent to collect information from multiple locations in a short time frame, and analyzing the samples on site using a mobile lab. In this way, the results can be used to make field decisions regarding well point locations, thereby avoiding the need to remobilize following sample analysis. Sampling should start close to the former USTs, with initial samples collected at the surface of the groundwater table, midpoint of the saturated zone, and at the clay layer, to determine vertical variation in contaminant concentrations. Additional samples could then be collected at 50' intervals or as indicated by sample results, both in the direction of the clay layer slope, and in the direction of groundwater flow.

To avoid delaying the completion of the FS, this should be conducted as a separate investigation, with the results presented as an addendum to the RI, and evaluation of remedial alternatives, if needed, presented as an addendum to the FS.

Storm Sewer and Catch Basin IRM:

In Comment 34, MMC states that removal of sediment from affected storm sewers and catch basins could be performed under an IRM or evaluated and remediated during the FS. The DEC agrees that this could appropriately be performed under an IRM. If an agreement is worked out expeditiously, it may be possible to perform the work this construction season. Please contact me to discuss this further.

If you have any questions, please contact me at 518/457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: S. Fenske, Esq.
V. Robbins, Esq.
H. Hamel, DOH

Attachment 2

Letter from LMC to NYSDEC dated March 21, 1995

MARTIN MARIETTA
)CEAN, RADAR & SENSOR SYSTEMS

POST OFFICE BOX 4840
SYRACUSE, NEW YORK 13221-4840
TELEPHONE (315) 456-0123

March 1995

RECEIVED
MAR 2 3 1995
B.A. KENT

Is. Catherine A. Klatt
Project Engineer
Remedial Action Section A
ureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
) Wolf Road
Albany, New York 12233

E: Additional Soil Sampling in the Wetland Adjacent to Outfall 003
Farrell Road Site, Geddes, New York
Site No. 7-34-055

Dear Ms. Klatt:

s discussed in our meeting at the Farrell Road Site on 1 March 1995, Martin Marietta Corporation (MMC) will implement the soil sampling program requested in Comment 3 of the ew York State Department of Conservation (NYSDEC) letter dated 21 February 1995. The goal f the sampling is to estimate the extent of PCBs adjacent to Outfall 003. The sampling will be conducted by ERM-Northeast, Inc. (ERM), the consultant used by MMC to conduct the remedial vestigation (RI). All sampling, field and laboratory procedures will be conducted according to ne NYSDEC approved January 1994 RI/FS Work Plan. All field work and analytical methodology will follow the Sampling, Analysis, and Monitoring Plan (SAMP), Quality Assurance roject Plan (QAPP), and Health and Safety Plan (HASP).

To estimate the extent of PCBs at Outfall 003, ERM will collect soil samples with a bucket auger : the following locations:

Sample 1	12 feet away from the outfall	12-inches below grade;
Sample 2	22 feet away from the outfall	surface;
Sample 3	22 feet away from the outfall	12-inches below grade;
Sample 4	32 feet away from the outfall	surface;
Sample 5	32 feet away from the outfall	12-inches below grade;
Sample 6	42 feet away from the outfall	surface.

Additionally, one random duplicate and one MS/MSD sample will be collected to comply with the QA/QC requirements of the Work Plan. Samples will be analyzed by Adirondack Environmental Services Laboratory (AES) for PCBs by EPA-8080. All analytical data packages will be validated and prepared in tabular form for submittal as an addendum to the Final RI Report. Data tables will contain detection limits, detected concentrations and appropriate action levels.

Pending approval of this Scope of Work, the field work is currently being scheduled for Thursday, 30 March 1995. MMC or ERM will contact your offices at least 48 hours prior to the initiation of field work.

Please call either Pat Salvador at (315) 456-3199 or me at (315) 456-6976 if you have any questions regarding this matter.

Sincerely,
MARTIN MARIETTA CORPORATION

BrianA. Kent, Manager
Environment, Health & Safety

cc: Henriette Hamel - NYSDOH
Director, Bureau of Environmental Exposure Investigations - NYSDEC
Ralph Manna - NYSDEC
Michael Lesser - NYSDEC
Virginia Robbins - Bond Schoeneck and King
Robert Schick - NYSDEC

Attachment 3

Letter from NYSDEC to LMC dated March 28, 1995

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

MMC

MAR 3 1 1995

Environment, Health
& Safety

March 28, 1995

Mr. Brian A. Kent
Principal Engineer
Martin Marietta Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Dear Mr. Kent:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the soil sampling program for Outfall 003 as described in your letter of March 21, 1995. The sampling program is approved.

In the two samples collected at the outfall in the RI, the concentration of PCB at one foot was higher than at the surface. As the depth of PCB contamination will need to be determined for the remedial design, we suggest that MMC collect an additional sample at the outfall at a depth of two feet.

If you have any questions, please contact Catherine Klatt at 518/457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, DOH
S. Fenske, Esq.
V. Robbins, Esq.

Attachment 4

Letter from LMC to NYSDEC dated April 3, 1995

Martin Marietta
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840
Telephone 315-456-0123

LOCKHEED MARTIN

Bldg. 5 - Room H6
Electronics Park
Syracuse, NY 13221
April 3, 1995

Mr. Robert W. Schick, PE
Section Chief, Remedial Section
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

RE: Soil Sampling at Outfall 003
Farrell Road Site
Town of Geddes, Onondaga County, New York
Site No. 7-34-055

Dear Mr. Schick:

Martin Marietta Corporation (MMC) is in receipt of the Department's letter dated March 28, 1995 approving the soil sampling program at Outfall 003 at the above referenced site.

In accordance with the Department's request, MMC will expand the sampling program to include collection of one (1) additional soil sample at the outfall at a depth of two feet.

As discused with Ms. Catherine Klatt, ERM-Northeast, Inc. (ERM) conducted the sampling on Thursday, March 30, 1995.

If you have any questions, please contact Pat Salvador (315) 456-3199 or me (315) 456-6976 at your convenience.

Very truly yours,

Brian A. Kent, Mgr.,
Environment, Safety and Health

/cl

pc: Director, Bureau of Environmental Exposure Investigations, NYSDEC
Henriette Hamel - NYSDOH
Michael Lesser - NYSDEC
Ralph Manna - NYSDEC
Virginia Robbins - Bond, Schoeneck & King

Attachment 5

Letter from LMC to NYSDEC dated July 5, 1995

Martin Marietta
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

July 5, 1995

Ms. Catherine A. Klatt
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

RE: Soil Sampling in the Wetlands Adjacent to Outfall 003
Farrell Road Plant; Geddes, New York
NYSDEC Site No. 7-34-055

Dear Ms. Klatt:

Please find enclosed the letter report (dated June 28, 1995) prepared by ERM-Northeast, Inc., (ERM) summarizing the results of the soil sampling conducted on March 30, 1995 in the wetlands adjacent to Outfall 003.

In accordance with our telephone conversation on Tuesday, June 20, 1995, ERM has prepared a recommendation and Scope of Work to further evaluate the extent of contaminated soil in the wetlands adjacent to Outfall 003 by immunoassay field screening techniques. Lockheed Martin requests New York State Department of Environmental Conservation (NYSDEC) approval to conduct the field screening program as outlined in the ERM letter report dated June 28, 1995. Following Department approval, a schedule to conduct the work will be provided.

Once the extent of contaminated soil in the wetlands adjacent to Outfall 003 has been determined, an addendum to the Final RI Report will be prepared summarizing the results of the entire sampling program.

Please contact me on (315) 456-3199 if you have any questions or need additional information.

Very truly yours,

Patrick Salvador

Patrick D. Salvador, P.E.
Principal Engineer

c: Director, Bureau of Environmental Exposure Investigation, NYSDEC
Henriette Hamel - NYSDOH
Michael Lesser - NYSDEC
Ralph Manna, NYSDEC
Virginia Robbins - Bond, Schoeneck & King
Robert Schick - NYSDEC

ERM-Northeast

5788 Widewaters Parkway
Dewitt, New York 13214
(315) 445-2554
(315) 445-2543 (Fax)

28 June 1995

Mr. Patrick Salvador
Lockheed Martin Corporation
Environment, Safety & Health
Building 5 - Room H6
Syracuse, New York 13221

RE: Soil Sampling in the Wetlands Adjacent to Outfall 003
Farrell Road Plant, Geddes, New York
NYSDEC Site No. 7-34-055
ERM-Northeast Project No. 557.044

Dear Mr. Salvador:

As requested, ERM-Northeast, Inc. (ERM) collected additional soil samples from the wetland north of the Farrell Road Plant Site (FRP). The samples were collected on 30 March 1995 by ERM geologists. This letter presents a brief review of the analytical results and a recommendation for future action.

BACKGROUND AND DESCRIPTION OF SAMPLING

A Remedial Investigation/Feasibility Study (RI/FS) is currently being conducted at the referenced site. The Remedial Investigation (RI) was conducted in 1994 while the Feasibility Study (FS) is currently in preparation. One soil sample collected during the RI from the wetland north of the site contained elevated levels of polychlorinated biphenyls (PCBs). The sample was located at the discharge point of outfall 003. At the request of the New York State Department of Environmental Conservation (NYSDEC), additional soil samples were collected downstream of outfall 003 to further delineate the extent of PCBs.

On 30 March 1995, ERM collected seven soil samples from five locations downstream of outfall 003 (see Figure 1). The samples were collected in accordance with the sampling program established in the 21 February 1995 letter of comment from the NYSDEC, Martin Marietta's letter detailing the sampling program dated 21 March 1995, and NYSDEC's 28 March 1995 letter of approval. All samples were sent to Adirondack Environmental Services, Inc. for PCB analysis by USEPA Method 8080. All sample handling and analysis was conducted according to NYSDEC 1991 Analytical Services Protocol (ASP) Superfund Contract Laboratory Program (CLP) protocols. All field activity was conducted as specified in the approved January 1994 RI/FS Work Plan.

Soil samples were collected from the near surface (0 to 0.5-foot interval) and/or from the shallow subsurface (1 to 1.5-foot interval) with a 3-inch diameter hand auger. To reduce the risk of cross-contamination, a four-foot long section of 4-inch diameter PVC pipe was inserted into the borehole to seal off any surface soil while collecting the deeper sample. The sample OF-003 (1.5-2) was collected in approximately 12-inches of standing water at the outfall discharge.

Generally, near surface soil was dark brown to black silt and fine-grained sand and contained decaying organic material. The underlying shallow subsurface soil was brown to grayish-brown fine-grained sand and silt. Generally, the contact between the overlying wetland organic soil and the underlying silt and sand occurred at 6-inches below grade.

ANALYTICAL RESULTS

All analytical data were validated by an environmental chemist. The data were evaluated according to the protocols of the USEPA National Functional Guidelines for Organic Data Review (June 1991). The data validation review found the data technically acceptable and in compliance with the requirements of SW-846 and the NYSDEC ASP.

Four samples were collected from the shallow subsurface. Sample S1 (1-1.5) contained 15 ug/Kg total PCB and OF-003 (1.5-2) contained 200 ug/Kg total PCBs (Table 1). Both samples contained PCBs at concentrations less than the cleanup objective of 1,000 ug/Kg as referenced in the NYSDEC Division of Hazardous Waste Remediation Technical and Administrative Guidance Memorandum #4046, 24 January 1994 (NYSDEC DHWR #4046). The other two subsurface samples did not contain any PCBs above detection limits.

Three samples were collected from the near surface. Samples S2 (0- 0.05) contained 1390 ug/kg total PCBs, sample S3 (0-0.05) contained 800 ug/Kg total PCBs and S4 (0-0.5) contained 3,000 ug/Kg total PCBs. Samples S2 (0-0.5) and S4 (0-0.5) exceed NYSDEC DHWR TAGM #4046 cleanup objectives of 1,000 ug/Kg.

SUMMARY AND RECOMMENDATIONS

ERM collected seven soil samples from the wetland downstream of outfall 003. The samples were analyzed for PCBs by USEPA Method 8080. The analytical results indicate that the near surface soil contains concentrations of PCBs in excess of the NYSDEC DHWR TAGM # 4046 cleanup objectives; however, shallow subsurface samples are below soil cleanup objectives.

TABLE 1
SUMMARY OF ANALYTICAL DATA
OUTFALL 003 PCB SAMPLING
FARRELL ROAD PLANT

ERM

BORING	S1	S2	S2	S3	DUPE S3	S3	S4	OF-003
DEPTH (ft)	1-1.5	0-0.5	1-1.5	0-0.5	0-0.5	1-1.5	0-0.5	1.5-2
DATE COLLECTED	3/30/95	3/30/95	3/30/95	3/30/95	3/30/95	3/30/95	3/30/95	3/30/95
arochlor - 101	<51	<260	<42	<130	<130	<46	<1100	<41
arochlor - 122	<51	<260	<42	<130	<130	<46	<1100	<41
arochlor - 123	<51	<260	<42	<130	<130	<46	<1100	<41
arochlor - 124	<51	<260	<42	<130	<130	<46	<1100	<41
arochlor - 124	<51	<260	<42	<130	<130	<46	<1100	<41
arochlor - 125	<51	910	<42	390	380	<46	<1100	<41
arochlor - 126	15 J	480	<42	410	500	<46	3000	200

NOTES
- concentrations reported in ug/Kg (ppb).
J - associated numerical value is an estimated quantity.
(a) - all results with detectable concentrations appear in bold typeface.

The investigation estimated the vertical extent of PCBs; the near surface soil contains PCBs but shallow subsurface soils are not affected. These data indicate that the near surface soil in the wetland adjacent to outfall 003 contains PCBs in excess of NYSDEC DHWR TAGM #4046 cleanup objectives; however, the lateral extent of PCBs was not estimated.

ERM recommends an extended investigation using immunoassay field screening techniques with laboratory confirmation. Approximately 20 percent of the samples screened will be sent to a NYSDOH approved laboratory for analysis via USEPA Method 8080 with a standard laboratory deliverable. Immunoassay field screening is a USEPA-approved technology for characterizing PCBs. It is cost effective and can provide real-time data. To further estimate the extent of PCBs, ERM recommends that near surface soil samples be collected at the grid nodes of a 25 foot by 25 foot soil sampling grid (see Figure 2). Samples will be collected with a hand auger, and screened on-site. Samples should be analyzed for concentrations ranging from 1 to 10 ppm. To further define the lateral extent of PCB affected soil, the sample interval should be reduced to 10 feet between the last affected sample and the non-detect sample point.

The results of the sampling conducted on 30 March 1995 and the results of the scope of work contained in this letter will be submitted as an addendum to the Final RI Report and can be directly incorporated into the FS.

Please call me or Sean Pepling if you have any questions regarding this report.

ERM

Sincerely,

Edward J. Hinchey
Project Manager

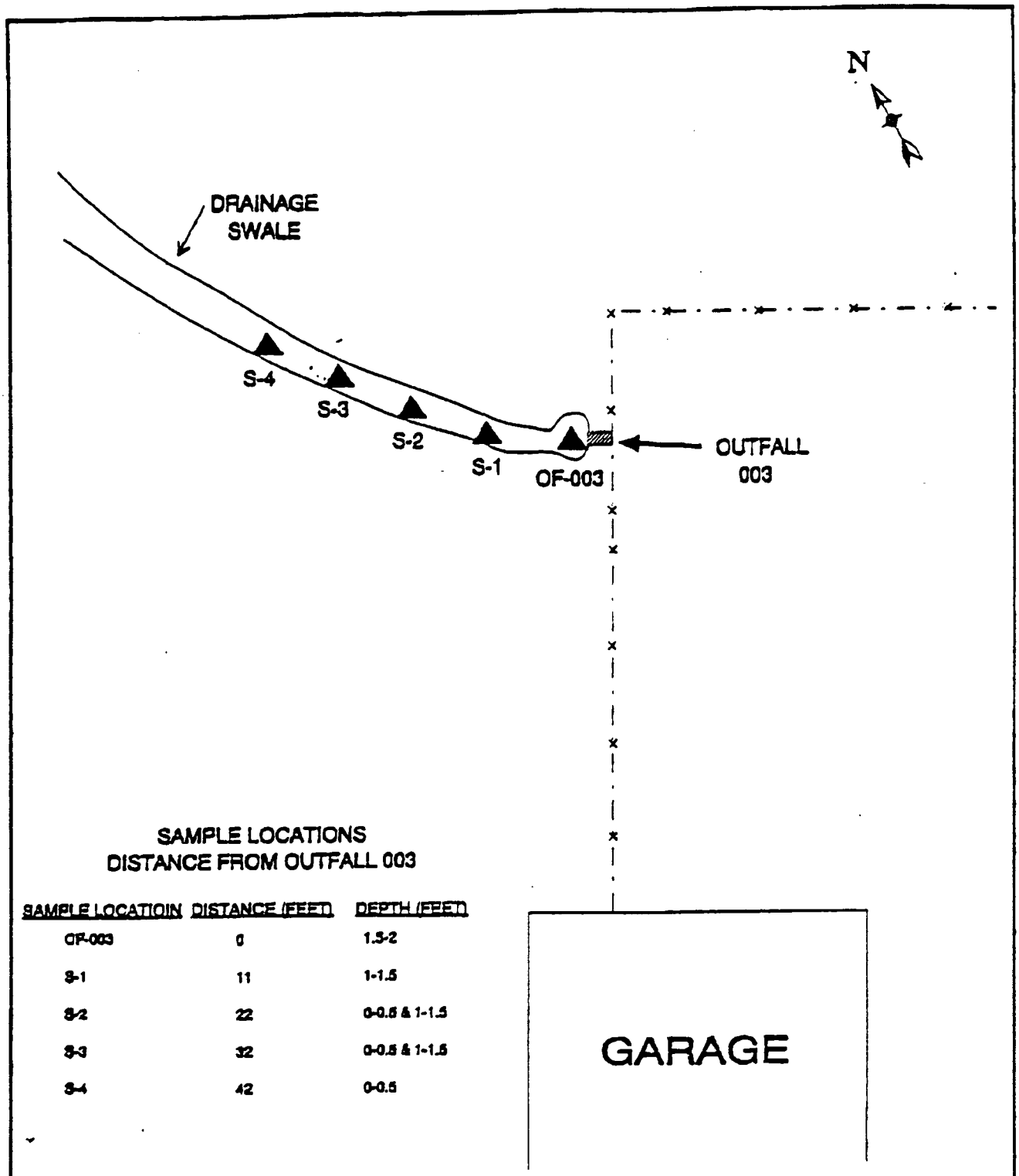
Sean Pepling
Project Geologist

Attachments

cc: Virginia Robbins - Bond Schoeneck & King

ATTACHMENT

(Figures)



SAMPLE LOCATIONS
DISTANCE FROM OUTFALL 003

SAMPLE LOCATIOIN	DISTANCE (FEET)	DEPTH (FEET)
OF-003	0	1.5-2
S-1	11	1-1.5
S-2	22	0-0.5 & 1-1.5
S-3	32	0-0.5 & 1-1.5
S-4	42	0-0.5

LEGEND

- SOIL SAMPLING LOCATION
- OUTFALL 003
- FENCE

WETLAND SOIL SAMPLE LOCATIONS
30 MARCH 1995

PREPARED FOR: LOCKHEED MARTIN CORPORATION

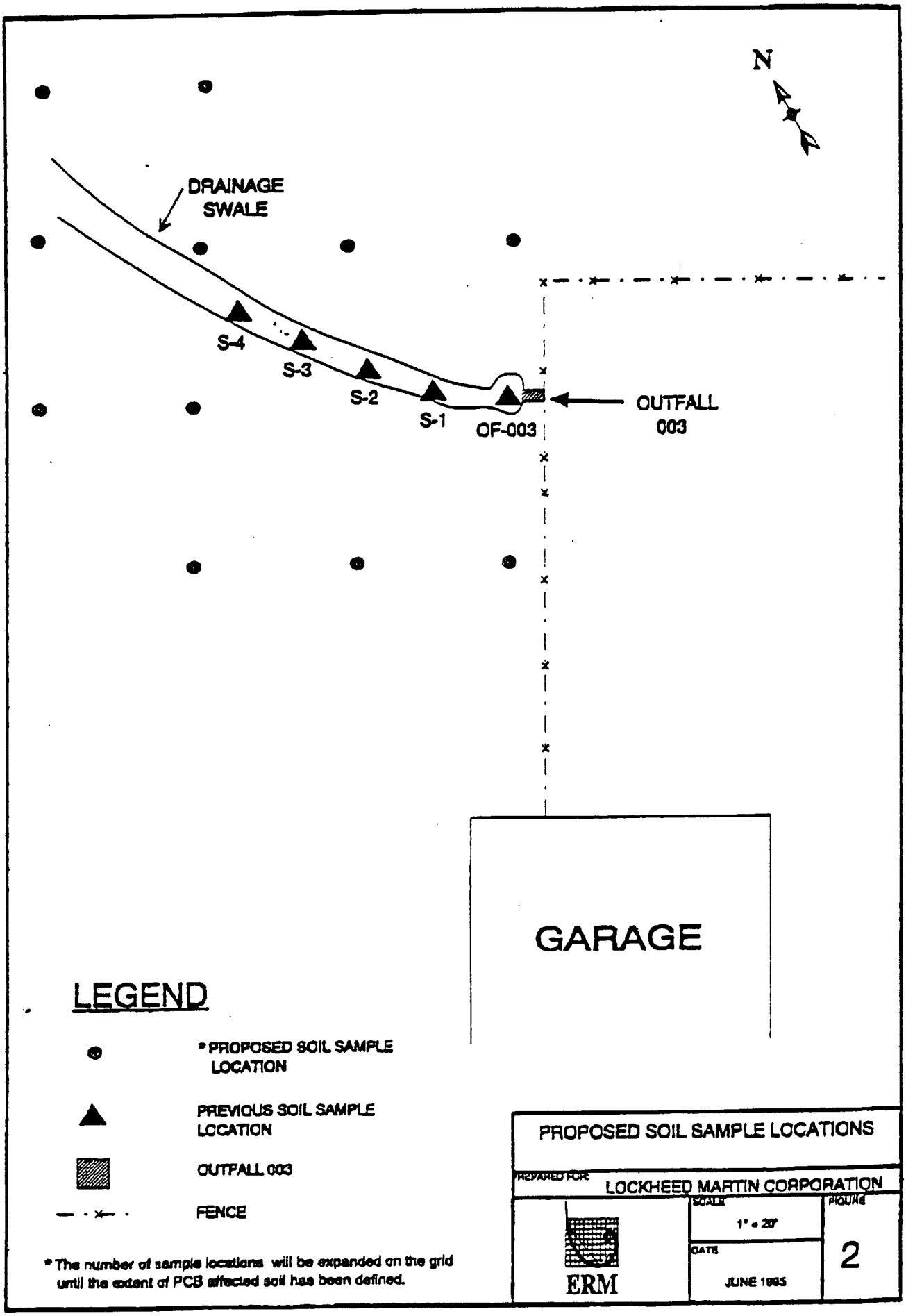
ERM

SCALE: 1" = 20'

DATE: JUNE 1995

FIGURE: 1

GATEWAY:\C:\PROJECTS\LMC\PCS\SAMP1.DRW


N
DRAINAGE SWALE
S-4
S-3
S-2
S-1
OF-003
OUTFALL 003
GARAGE
LEGEND
* PROPOSED SOIL SAMPLE LOCATION
PREVIOUS SOIL SAMPLE LOCATION
OUTFALL 003
FENCE
* The number of sample locations will be expanded on the grid until the extent of PCB affected soil has been defined.
PROPOSED SOIL SAMPLE LOCATIONS
PREPARED FOR: LOCKHEED MARTIN CORPORATION
ERM
SCALE: 1" = 20'
DATE: JUNE 1995
FIGURE: 2
G:\GATEWAY\G:\PROJECTS\LMC\PCBLOC.CRW

Attachment 6

Letter from NYSDEC to LMC dated August 7, 1995

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

August 7, 1995

Michael D. Zagata
Commissioner

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Martin Marietta Corporation
Bldg. 5, Room H6
Electronics Park
Syracuse, NY 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055
Outfall 003 Sampling

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have reviewed the letter report summarizing the results of the sampling conducted on March 30, 1995 in the wetlands adjacent to Outfall 003 and the outline of a scope of work for further sampling. The following comments should be addressed before proceeding with the sampling:

* The sample grid proposed does not include any samples located within the drainage swale: either some of the sampling points should be moved to within the swale, or additional sampling points should be added. One of the samples sent for lab analysis via Method 8080 should be the farthest sample collected from the swale.

* A sample should also be analyzed for Total Organic Carbon, as TOC is used in determining cleanup objectives by both TAGM 4046 and by the DFW Technical Guidance for Screening Contaminated Sediment.

* The NYSDEC DHWR TAGM 4046 is not the only guidance to consider in determining cleanup values, as the focus of TAGM 4046 is protection of groundwater, not protection of fish and wildlife. For risks to fish and wildlife within the wetlands, the Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediment, November 22, 1993, must also be considered, and is especially appropriate for the sediments in the drainage swale.

* Methods for using the immunoassay field test kits are not included in the approved RI/FS Work Plan, and should be provided for NYSDEC review as soon as possible, as well as

the project schedule. All other proposed field and analytical activities are covered by the existing Work Plan (including the QAPP and HASP) and as long as the methods in the Work Plan are followed, the DEC and DOH do not need to review a separate Work Plan.

The letter report will be approved upon receipt of the revisions described above. If you have any questions, please contact me at 518/457-4343.

Sincerely,

Catherine A. Klatt

Catherine A. Klatt
Project Engineer
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, DOH
S. Lee Fenske, Esq.
V. Robbins, Esq.

Attachment 7

Letter from LMC to NYSDEC dated August 23, 1995

Martin Marietta
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

August 23, 1995

Robert W. Schick, P.E.
Section Chief, Remedial Section
Bureau of Western Remedial Action
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233-7010

RE: Outfall 003 Sampling
Response to NYSDEC Letter Dated August 7, 1995
GE Farrell Road Site, Town Of Geddes, Onondaga County, New York
NYSDEC Site No.: 7-34-055

Dear Mr. Schick:

Martin Marietta Corporation (MMC) has reviewed the comment letter dated August 7, 1995 from the New York State Department of Environmental Conservation (NYSDEC) regarding the soil sampling adjacent to outfall 003 and offer the following response. Each NYSDEC comment is presented below followed by MMC's response.

NYSDEC Comment 1 **The sample grid proposed does not include any samples located within the drainage swale: either some of the sampling points should be moved to within the swale, or additional sampling points should be added. One of the samples sent for lab analysis via Method 8080 should be the farthest sample collected from the swale.**

MMC Response Figure 2 from the 28 June 1995 ERM-Northeast, Inc. (ERM) letter report has been modified to relocate two samples to within the swale (see revised Figure 2 attached to this letter). Additionally, the farthest sample collected from the swale will be sent to an analytical laboratory for analysis by USEPA Method 8080.

NYSDEC Comment 2 **A sample should also be analyzed for Total Organic Carbon, as TOC is used in determining cleanup objectives by both TAGM 4046 and by the DFW Technical Guidance for Screening Contaminated Sediment.**

MMC Response As requested, MMC will collect one representative sample for analysis by USEPA Method 9060A for TOC.

NYSDEC Comment 3 **The NYSDEC DHWR TAGM 4046 is not the only guidance to consider in determining cleanup values, as the focus of TAGM 4046 is protection of groundwater, not protection of fish and wildlife, For risks to fish and wildlife within the wetlands, the Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediment, November 22, 1993 must also be considered, and is especially appropriate for the sediments in the drainage swale.**

MMC Response MMC will propose remedial objectives in the Feasibility Study (FS). In determining the appropriate remedial objectives, MMC will give consideration to the referenced screening guidance. However, for this investigation, ERM used TAGM 4046 as a conservative indicator of potentially affected media.

Wetlands are composed of both soils and sediment. Currently, there is no clear distinction between what comprises a wetland soil and a sediment. ERM observed a thin (less than six-inches thick) humic soil on top of a well sorted medium to fine alluvial sand. Benthic organisms were not observed in any of the samples and the samples were not collected from the bottom of a lake, pond, river, bay, estuary or ocean (see DFW Technical Guidance for Screening Contaminated Sediment, page 2).

It is our consultant's experience that these samples were collected from a soil development and not from sediment derived from an aquatic system. The values presented in TAGM 4046 are appropriate for soils.

NYSDEC Comment 4 **Methods for using the immunoassay field test kits are not included in the approved RI/FS Work Plan, and should be provided for NYSDEC review as soon as possible, as well as the project schedule. All other proposed field and analytical activities are covered by the existing Work Plan (including the QAPP and HASP) and as long as the methods in the Work Plan are followed, the DEC and DOH do not need to review a separate Work Plan.**

MMC Response The proposed field kits are prepared by Ensys Inc. of Princeton, New Jersey which comply with all SW-846 protocol. The latest version of the USEPA Method 4020 specifically cites the ENSYS field kits. A copy of selected pages of the latest version of SW-846 Method 4020 (January 1995) have been attached to this letter for your review.

MMC is prepared to mobilize our consultant (ERM-Northeast, Inc.) to collect the additional samples within 14 days of notice to proceed from NYSDEC. An outline of anticipated activities is presented below for your review.

NYSDEC approval of scope of work	September 11, 1995
Collect Samples	September 25-26, 1995
Field screening data available	September 27, 1995
Issue Addendum to the RI Report	October 25, 1995

After you have had an opportunity to review these responses, please contact me if you have any additional questions or require additional information.

Sincerely,

Patrick Salvador

Patrick Salvador, P.E.
Principal Engineer

Attachments

cc: Director, Bureau of Environmental Exposure Investigations - NYSDOH
Henriette Hamel - NYSDOH
Michael Lesser, Esq. - NYSDEC
Daniel Palm - NYSDEC
Virginia Robbins, Esq. - Bond Schoeneck and King

ATTACHMENT 2
(USEPA Method 4020)

PROPOSED UPDATE III
Cover Sheet

THIS PACKET CONTAINS NEW AND REVISED MATERIAL
BEING PROPOSED FOR INCLUSION IN:
TEST METHODS FOR EVALUATING SOLID WASTE
PHYSICAL/CHEMICAL METHODS
(SW-846) THIRD EDITION

Contents:

1. Cover sheet. (What you are currently reading)

2. Instructions. Read this section! It explains how proposed Update III relates to the rest of your SW-846.

3. Proposed Update III Disclaimer, Table of Contents, and Preface. The Table of Contents (dated January 1995) lists all of the methods (Third Edition, Updates I, II, IIA, IIB, and proposed Update III) in the order in which they will appear in the manual when Update III is finalized.

4. Revised Chapter Two: Choosing the Right Method

5. Revised Chapter Three and new/revised methods for inorganic analyses.

6. Revised Chapter Four and new/revised methods for organic analyses.

7. Revised Chapter Five and new/revised methods for miscellaneous analyses.

8. Revised Chapter Six and new/revised methods for properties analyses.

9. Revised Chapter Eight (revised section separation sheets only).

10. Revised Chapter Ten and new/revised methods for sampling.

METHOD 4020

SCREENING FOR POLYCHLORINATED BIPHENYLS BY IMMUNOASSAY

1.0 SCOPE AND APPLICATION

1.1 Method 4020 is a procedure for screening soils and non-aqueous waste liquids to determine when total polychlorinated biphenyls (PCBs) are present at concentrations above 5, 10 or 50 mg/kg. Method 4020 provides an estimate for the concentration of PCBs by comparison with a standard.

1.2 Using the test kit from which this method was developed, 95% of soil samples containing 0.625 ppm or less of PCBs will produce a negative result in the 5 ppm test configuration. Using another commercially available test kit, 97% of soil samples containing 0.25 ppm or less of PCBs will produce a negative result in the assay and greater than 99% of the samples containing 1.0 ppm or more will produce a positive result. Tables 2-5, 7, 10, and 11 present false positive and false negative data generated from commercially available test kits. Using a test kit commercially available for screening non-aqueous waste liquids, >95% of samples containing 0.2-0.5 ppm or less of PCB will produce a negative result.

1.3 In cases where the exact concentrations of PCBs are required, quantitative techniques (i.e., Method 8082) should be used.

1.4 This method is restricted to use by or under the supervision of trained analysts. Each analyst must demonstrate the ability to generate acceptable results with this method.

2.0 SUMMARY OF METHOD

2.1 Test kits are commercially available for this method. The manufacturer's directions should be followed. In general, the method is performed using a sample extract. Sample and an enzyme conjugate reagent are added to immobilized antibody. The enzyme conjugate "competes" with PCB present in the sample for binding to immobilized anti-PCB antibody. The test is interpreted by comparing the response produced by testing a sample to the response produced by testing standard(s) simultaneously.

3.0 INTERFERENCES

3.1 Chemically similar compounds and compounds which might be expected to be found in conjunction with PCB contamination were tested to determine the concentration required to produce a positive test result. These data are shown in Tables 1A, 1B, 1C, and 1D.

4.0 APPARATUS AND MATERIALS

4.1 Immunoassay test kit: PCB RISc™ (EnSys, Inc.), EnviroGard™ PCB in Soil (Millipore, Inc.), D TECH™ PCB test (Strategic Diagnostics Inc.), PCB

RISc™ Liquid Waste Test System (EnSys, Inc.), or equivalent. Each commercially available test kit will supply or specify the apparatus and materials necessary for successful completion of the test.

5.0 REAGENTS

5.1 Each commercially available test kit will supply or specify the reagents necessary for successful completion of the test.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 See the introductory material to this chapter, Organic Analytes, Section 4.1. Also refer to Reference 9 for the collection and handling of non-aqueous waste liquids.

6.2 Samples may be contaminated, and should therefore be considered hazardous and handled accordingly.

7.0 PROCEDURE

7.1 Follow the manufacturer's instructions for the test kit being used. Those test kits used must meet or exceed the performance specifications indicated in Tables 2-11.

8.0 QUALITY CONTROL

8.1 Follow the manufacturer's instructions for the test kit being used for quality control procedures specific to the test kit used. Additionally, guidance provided in Method 4000 and Chapter One should be followed.

8.2 Use of replicate analyses, particularly when results indicate concentrations near the action level, is recommended to refine information gathered with the kit.

8.3 Do not use test kits past their expiration date.

8.4 Do not use tubes or reagents designated for use with other test kits.

8.5 Use the test kits within their specified storage temperature and operating temperature limits.

8.6 Method 4020 is intended for field or laboratory use. The appropriate level of quality assurance should accompany the application of this method to document data quality.

9.0 METHOD PERFORMANCE

9.1 A study was conducted with the PCB RISc™ test kit using fourteen

standard soils and three soil samples whose PCB concentration had been established by Method 8082. Replicates were performed on seven of the standard soils and on one of the soil samples for a total of 25 separate analyses. Each of two different analysts ran the 25 analyses. Results indicated that "<" assignments are accurate with almost 99% certainty at the 50 ppm level while ">" assignments can be up to about 96% inaccurate as the sample concentration approaches that of the testing level. Corresponding certainties at the 5 ppm level are 92% and 82% respectively. Tables 2 and 3 summarize these results.

9.2 Table 4 presents method precision data generated using the PCB RISc™ test kit, comparing immunoassay test results with results obtained using Method 8082.

9.3 Method precision was determined with the EnviroGard PCB in Soil test kit by assaying 4 different soils (previously determined to contain 5.04, 9.78, 11.8, and 25.1 mg/kg by Method 8082), at three different sites, using three different lots of assay kits, three times a day for 9 days. A total of 81 analyses were performed for each soil. Error attributable to site, lot, date, and operator were determined. Separately, the relative reactivity of Aroclors 1242, 1248, 1254, and 1260 were determined. Based on Aroclor heterogeneity, and method imprecision, concentrations of Aroclor 1248 were selected that would result in greater than 99% confidence for negative interpretation. A study was conducted (Superfund SITE demonstration) on 114 field samples whose PCB concentration were also determined by Method 8082. 32 of the field samples were collected in duplicate (as coded field duplicates) and assayed by standard and immunoassay methods. The results for all 146 samples are summarized in Tables 5 and 6.

9.4 Grab samples were obtained from sites in Pennsylvania, Iowa and Illinois using a stainless steel trowel. Each sample was homogenized by placing approximately six cubic inches in a stainless steel bucket and mixing with the trowel for approximately two minutes. The soils was aliquotted into 2 six ounce glass bottles. The samples were tested on site using the D TECH PCB test kit, and sent to an analytical laboratory for analysis by Method 8082. These data are compared in Table 7.

9.5 Tables 8 and 9 present data on the inter- and intra-assay precision of the PCB RISc™ Liquid Waste Test System. The data were generated using 11 samples, each spiked at 0, 0.2 and 5 ppm, and assayed 4 times.

9.6 Tables 10 and 11 provide data from application of the PCB RISc™ Liquid Waste Test System to a series of liquid waste samples whose PCB concentration had been established by Method 8082.

10.0 REFERENCES

1. J.P. Mapes, T.N. Stewart, K.D. McKenzie, L.R. McClelland, R.L. Mudd, W.B. Manning, W.B. Studabaker, and S.B. Friedman, "PCB-RISc™ - An On-Site Immunoassay for Detecting PCB in Soil", Bull. Environ. Contam. Toxicol. (1993) 50:219-225.

2. PCB RISc™ Users Guide, Ensys Inc.

3. R.W. Counts, R.R. Smith, J.H. Stewart, and R.A. Jenkins, "Evaluation of PCB Rapid Immunoassay Screen Test System", Oak Ridge National Laboratory, Oak Ridge, TN 37831, April 1992, unpublished

4. EnviroGard PCB in Soil Package Insert, Millipore Corp. 2/93.

5. Technical Evaluation Report on the Demonstration of PCB Field Screening Technologies, SITE Program. EPA Contract Number 68-CO-0047. 2/93.

6. D TECH™ PCB Users Guide , SDI/Em Sciences

7. Melby, J.M., B.S. Finlin, A.B. McQuillin, H.G. Rovira, J.W. Stave, "PCB Analysis by Enzyme Immunoassay", Strategic Diagnostics Incorporated, Newark, Delaware, 1993

8. Melby, J.M., B.S. Finlin, A.B. McQuillin, H.G. Rovira, "Competitive Enzyme Immunoassay (EIA) Field Screening System for the Detection of PCB", 1993 PCB Seminar, EPRI, September 1993

9. T.A. Bellar and J.J Lichtenberg. The Analysis of Polychloringated Biphenyls in Transformer Fluid and Waste Oils. U.S. EPA Research and Development, EPA/EMSL-ORD, Cincinnati, Ohio (June 24, 1980). Revised June 1981, EPA 600/4-81-045.

10. PCB RISc™ Liquid Waste Test System, User's Guide, EnSys Environmental Products, Inc.

Attachment 8

Letter from LMC to NYSDEC dated November 29, 1995

Martin Marietta
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

November 29, 1995

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

RE: Remedial Investigation Report Addendum
Soil Sampling in the Wetlands Adjacent to Outfall 003
Farrell Road Plant; Geddes, New York
NYSDEC Site No. 7-34-055

Dear Mr. Schick:

Please find enclosed the letter report (dated November 27, 1995) prepared by ERM-Northeast, Inc., (ERM) summarizing the results of the soil sampling conducted on March 30, 1995, September 26, 1995 and October 3,1995 in the wetlands adjacent to Outfall 003.

Martin Marietta requests NYSDEC approval to incorporate the results of these sampling activities into the Final RI Report.

Please contact me at (315) 456-3199 if you have any questions or need additional information.

Sincerely,

Patrick Salvador

Patrick D. Salvador, P.E.
Principal Engineer

Enclosure

c: Director, Bureau of Environmental Exposure Investigation, NYSDOH
Sandra Lee Fenske, Esq. - Martin Marietta
Henriette Hamel - NYSDOH
Michael Lesser, Esq. - NYSDEC
Daniel Palm, Director, NYSDEC
Virginia C. Robbins, Esq. - Bond, Schoeneck & King

ERM-Northeast

5788 Widewaters Parkway
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27 November 1995

Mr. Patrick D. Salvador, P.E.
Martin Marietta Corporation
Environment, Safety & Health
Building 5 - Room H6
Syracuse, New York 13221

RE: Remedial Investigation Report Addendum
Soil Sampling in the Wetlands Adjacent to Outfall 003
Farrell Road Plant, Geddes, Onondaga County, New York
NYSDEC Site No. 7-34-055
ERM-Northeast Project No. 995.002

Dear Mr. Salvador:

As requested, ERM-Northeast, Inc. (ERM) collected additional soil samples from the area north and west of Outfall 003 at the Farrell Road Plant (the site) to define the extent of soil with polychlorinated biphenyl (PCB) concentrations greater than 1 part-per-million (ppm). The first round of additional soil samples were collected on 30 March 1995 from the axis of the drainage swale adjacent to Outfall 003. These data were reported in a letter dated 28 June 1995. The New York State Department of Environmental Conservation (NYSDEC) requested additional samples from the soil adjacent to the drainage swale to define the lateral extent of affected soil. The additional soil samples were collected and screened for PCBs in the field on 26 September and 3 October 1995 by ERM. This letter presents background information, field methods, and a summary of the analytical results of the investigation. This letter will serve as an addendum to the 1994 Remedial Investigation Report dated October 1994 which was previously submitted and approved by NYSDEC.

BACKGROUND AND DESCRIPTION OF SAMPLING

A Remedial Investigation/Feasibility Study (RI/FS) is currently being conducted at the site. The RI was conducted in 1994 while the FS is currently being reviewed by NYSDEC. One soil sample collected during the RI from the wetland north of the site contained 2.9 ppm PCBs (Aroclor 1254). The recommended soil cleanup value for PCBs is 1 ppm as listed in NYSDEC Division of Hazardous Waste

Remediation Technical and Administrative Guidance Memorandum #4046, dated 24 January 1994 (TAGM #4046). This sample was located at the discharge point adjacent to Outfall 003. At the request of the NYSDEC, additional soil samples were collected downstream of Outfall 003 to further estimate the extent of affected soil.

ERM

On 30 March 1995, ERM collected seven soil samples from five locations downstream of Outfall 003 (sample locations OF-003 and S-1 through S-4; see Figure 1). The results of this first round of additional sampling were presented in a report by ERM dated 28 June 1995. Because the sample located farthest downstream from Outfall 003 (sample location S-4) contained PCBs above 1 ppm, NYSDEC requested additional soil sampling and analysis. On 26 September and 3 October 1995, ERM collected 27 additional soil samples adjacent to Outfall 003. The samples were collected in accordance with the sampling program as established in the 23 August 1995 letter from Martin Marietta to NYSDEC which incorporated NYSDEC comments from a letter dated 7 August 1995. All samples were screened in the field for PCBs using Ensys, Inc. immunoassay field screening kits (see section entitled "PCB Immunoassay Field Screening" below). A total of seven samples were sent to Adirondack Environmental Services, Inc. for confirmation PCB analysis by USEPA Method 8080, including one duplicate sample. In accordance with NYSDEC request, one sample was also analyzed for total organic carbon (TOC). A TOC value of 5% is assumed in the calculation of the recommended soil cleanup objective for PCBs listed in TAGM #4046. If site specific TOC is known, the site specific TOC value is used to calculate an adjusted recommended soil cleanup objective.

All sampling activities were conducted in accordance with the approved January 1994 RI/FS Work Plan. Soil samples were collected on a 25 foot grid from the near surface (0 to 0.5-foot below grade) with a three-inch diameter stainless steel/carbon steel hand auger. The sample was homogenized thoroughly and transferred directly into clean, laboratory-supplied glass jars and placed into a chilled cooler. Samples were then transferred to the field screening area located inside the garage building. All sample locations were measured relative to Outfall 003 and the northwest corner of the garage building.

Surface soil in the investigation area generally consisted of dark brown to black organic silt and fine-grained sand. Plant roots and plant debris were common in most samples. Insects and annelids were commonly present in the soil. The moisture content of the soil was generally damp to moist.

PCB IMMUNOASSAY FIELD SCREENING

PCB immunoassay field screening was conducted using Ensys, Inc. field screening kits following protocols established in USEPA Draft Method 4020 (USEPA, 1986). Based on laboratory analytical data from the 30 March 1995 sampling event, field screening kits were ordered for dilution scales (detection levels) of 1 and 10 ppm of Aroclor 1254/1260. Field screening analyses were performed concurrent with sampling activities to evaluate the need for additional sample locations resulting in further delineation of areas with PCB concentrations greater than 1 ppm.

Individual samples were homogenized as thoroughly as possible and weighed into 10.0 gram samples using an Acculab® Pocket Pro 150-B electronic digital scale. Samples were added to methanol extraction jars, agitated for one minute and allowed to settle. The extract was decanted into a disposable filtration apparatus and filtered. Preparation of two standards for use in the immunoassay occurred at the same time as sample dilutions. All sample and standard dilutions were performed by transferring specific amounts of sample/dilution extract using a Labindustries P-250 POPPETTE® adjustable micropippette. The electronic balance and the micropippette were calibrated daily.

Sample aliquots from the dilution procedure underwent two consecutive incubations of ten and five minutes, respectively, with the addition of an enzyme conjugate reagent between incubations. The incubations consisted of adding diluted sample extract to antibody-coated test tubes. The test tubes were agitated and allowed to react for the above-specified time intervals. Subsequent to the incubations, test tubes were washed with a mild detergent to stop the reaction. Color was developed in test tubes through the addition of several substrate solutions at timed intervals. These solutions fostered reactions that led to color development in test tube solutions that is inversely proportional to the amount of PCBs present in the sample.

In order to assess analyst accuracy during sample dilution and preparation, the prepared standards were compared to each other using an Artel DP Differential Photometer. The difference between the two standards was noted on PCB field screening data sheets (Quality Assurance (QA)/Quality Control (QC) procedures dictated for this test method require that the difference in optical density between the standards as measured by the photometer is less than 0.30). To evaluate the concentration of PCBs present (if any) in a sample, color developed in individual sample test tubes was compared to the darker of the two standards using the differential photometer. Samples which developed less color than the standard are interpreted as positive for that specific detection level (concentration of PCB in the

sample is greater than the detection level) due to the inversely proportional relationship between color development and PCB concentration. Samples which developed more color than the standard are interpreted as negative (concentration of PCB in the sample is less than the detection level). Sample identification, dilution scales, optical densities, interpreted concentrations, dates of analyses, and relevant comments were recorded on the field screening data sheets (See Attachment 3).

ERM

PCB ANALYTICAL RESULTS

Table 1 (attached) presents a summary of analytical data for all samples collected as part of additional soil sampling adjacent to Outfall 003. Field screening results are shown adjacent to laboratory results to allow for a comparison of the two data sets. Aroclors 1254 and 1260 were detected in previous laboratory analyses of samples collected on 30 March 1995. Therefore, the immunoassay test kits used during this investigation were designed with optimum detection capability for Aroclors 1254 and 1260 with detection levels of 1 and 10 ppm. However, Aroclors 1242 and 1248 were detected from laboratory analysis of the soil samples collected during this latest round of sampling. Because the immunoassay is two times more sensitive to Aroclors 1254 and 1260 than to Aroclor 1248 and four times more sensitive to Aroclors 1254 and 1260 than to Aroclor 1242, actual detection levels for these compounds must be adjusted to 2 and 20 ppm for Aroclor 1248 and 4 and 40 ppm for Aroclor 1242.

Field screening and laboratory results were used to generate a figure showing areas of soil with PCB concentrations greater than 1 ppm (see Figure 2). These data indicate that the affected area is irregularly shaped with no definitive directional trend. The presence of Aroclors 1242 and 1248 in the wetland soil at a location distant from the drainage swale, but not present in the outfall or drainage swale or proximal to it, suggests that the source of Aroclors 1242 and 1248 may be related to another source such as periodic flooding of the Seneca River.

When detection level considerations as outlined above are incorporated into the data, the correlation between field screening data and laboratory data from this project (percent of field screened samples where the laboratory-derived concentration is within the field screening-defined concentration range) is 83.3%, indicating the applicability of the field screening method to delineation of PCB-affected soil at this site. Additionally, two samples were field screened twice as duplicate analyses and two method blanks (no soil added to the methanol extraction jar) were field screened as QA/QC samples. Both field screened duplicates had the same result as the original analysis and both method blanks resulted in non-detect for PCBs.

TOC ANALYTICAL RESULTS

The basis for determining soil cleanup objectives is to protect human health and ground water. NYSDEC has established recommended cleanup objectives based on the water/soil equilibrium partitioning theory. The theory is conservative in nature and is based on the propensity for organic molecules in soil to adsorb other organic molecules.

ERM

Recommended soil cleanup objectives are based on a typical soil organic carbon content of 1% (0.01) for all analytes with the exception of PCBs, where an organic carbon content of 5% (0.05) is used. However, recommended soil cleanup objectives should be adjusted if the actual soil organic carbon content is known (TAGM #4046).

Analysis of sample LMC-FRP-S9 (0-0.5) for total organic carbon (TOC) resulted in a TOC value of 9.1% (0.091). Substituting this value for the 5% value used in TAGM #4046 results in an adjusted PCB soil cleanup objective of 1.6 ppm.

Recommended soil cleanup objectives should be developed through the Feasibility Study (FS) process. The 1.0 ppm cleanup objective for PCBs in TAGM #4046 is based on a soil organic carbon content of 5%. The organic carbon content of soil in the wetland is actually 9.1%. Therefore, a recommended soil cleanup objective of 1.6 ppm may be more appropriate for the site.

SUMMARY AND RECOMMENDATIONS

ERM collected a total of 32 soil samples for analysis of PCBs from the area north and west of Outfall 003. A total of 27 soil samples were field screened by USEPA Draft Method 4020. The sampling estimated the lateral extent of soil affected by PCBs in the vicinity of Outfall 003 and has isolated an area of PCB-affected soil. Six samples sent to a laboratory for confirmation analysis by USEPA Method 8080. Laboratory analysis of samples submitted to the laboratory for confirmation analysis indicate that the field screening data accurately estimated the amount of PCBs present in soil. Additional QA/QC measures (duplicate field screening analyses and field screening analysis of method blanks) further support the reliability of the field screening data set.

The analytical results indicate that an irregularly-shaped area of surface soil contains concentrations of PCBs in excess of the TAGM # 4046 recommended cleanup objective of 1 ppm. However, analysis of a sample for TOC which

contained 9.1% TOC suggests an adjustment of the PCB soil cleanup objective for this site is required. The site specific cleanup objective for PCBs should be developed through the FS process.

Due to the unexpected variation in the type of PCB present, field screening detection limits were modified in this report for the samples where laboratory analysis indicated the presence of Aroclor 1242 or Aroclor 1248.

ERM

The results of the additional soil sampling adjacent to Outfall 003 should be included as an addendum to the Final RI Report and can be directly incorporated into the FS.

Please contact the undersigned if you have any questions regarding this correspondence.

Sincerely,

Edward J. Hinchey
Senior Project Manager

Jon S. Fox, P.G.
Project Geologist

Attachments:

Attachment 1 - Table
Table 1 - Summary of Analytical Data

Attachment 2 - Figures
Figure 1 - Wetland Soil Sample Locations Through 3 October 1995
Figure 2 - Wetland Soil Sample Locations Area With PCBs > 1 ppm

Attachment 3 - Field Screening Data Sheets

ATTACHMENT 1

TABLE

TABLE 1
SUMMARY OF ANALYTICAL DATA
OUTFALL 003 SAMPLING
FARRELL ROAD PLANT

SAMPLE ID	SAMPLE DATE	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	Laboratory Result (ug/g) *	Field Screening Result (ppm) *
OF-003 (1.5-2.0)	3/30/95	----	----	----	0.2	0.2	NA
S-1 (1.0-1.5)	3/30/95	----	----	----	0.015	0.015	NA
S-2 (0.0-0.5)	**3/30/95**	**----**	**----**	**0.91**	**0.48**	**1.39**	**NA**
S-2 (1.0-1.5)	3/30/95	----	----	----	----	----	NA
S-3 (0.0-0.5)	3/30/95	----	----	0.39	0.41	0.8	NA
S-3 (0.0-0.5) DUPE	3/30/95	----	----	0.38	0.5	0.88	NA
S-3 (1.0-1.5)	3/30/95	----	----	----	----	----	NA
S-4 (0.0-0.5)	**3/30/95**	**----**	**----**	**----**	**3**	**3**	**NA**
S-5 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-6 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-7 (0.0-0.5)	**9/26/95**	**4.2**	**----**	**----**	**----**	**4.2**	**> 4, < 40**
S-8 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-9 (0.0-0.5)	9/26/95	----	----	----	----	----	< 1
S-9 (0.0-0.5) DUPE	9/26/95	----	----	----	----	----	NA
S-10 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-11 (0.0-0.5)	**9/26/95**	**NA**	**NA**	**NA**	**NA**	**NA**	**> 1, < 10**
S-11 (0.0-0.5) DUPE	**9/26/95**	**NA**	**NA**	**NA**	**NA**	**NA**	**> 1, < 10**
S-12 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-13 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-14 (0.0-0.5)	9/26/95	----	----	----	----	----	< 1
S-15 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-16 (0.0-0.5)	**9/26/95**	**NA**	**NA**	**NA**	**NA**	**NA**	**> 1, < 10**
S-17 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-18 (0.0-0.5)	**9/26/95**	**NA**	**NA**	**NA**	**NA**	**NA**	**> 1, < 10**
S-19 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-20 (0.0-0.5)	9/26/95	NA	NA	NA	NA	NA	< 1
S-21 (0.0-0.5)	**9/26/95**	**----**	**2**	**----**	**----**	**2**	**> 2, < 20**

TABLE 1
SUMMARY OF ANALYTICAL DATA
OUTFALL 003 SAMPLING
FARRELL ROAD PLANT

(Continued)

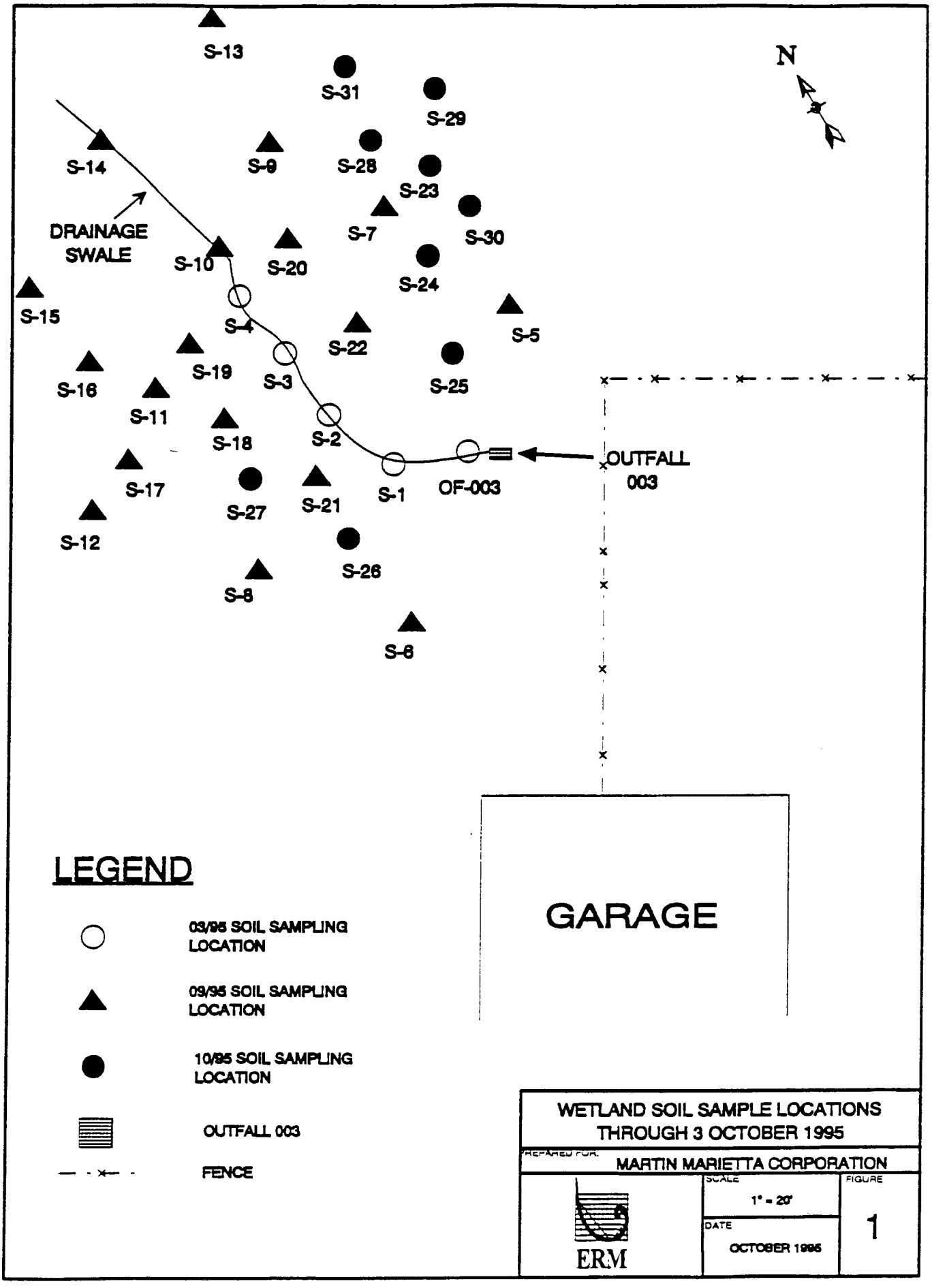
SAMPLE ID	SAMPLE DATE	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	Laboratory Result (ug/g) *	Field Screening Result (ppm) *
S-22 (0.0-0.5)	**9/26/95**	NA	NA	NA	NA	NA	**> 1, < 10**
S-23 (0.0-0.5)	**10/3/95**	NA	NA	NA	NA	NA	**> 1, < 10**
S-24 (0.0-0.5)	**10/3/95**	NA	NA	NA	NA	NA	**> 1, < 10**
S-25 (0.0-0.5)	10/3/95	NA	NA	NA	NA	NA	< 1
S-26 (0.0-0.5)	10/3/95	NA	NA	NA	NA	NA	< 1
S-27 (0.0-0.5)	10/3/95	NA	NA	NA	NA	NA	<1
S-28 (0.0-0.5)	**10/3/95**	----	**5.9**	----	----	**5.9**	**> 2, < 20**
S-29 (0.0-0.5)	10/3/95	NA	NA	NA	NA	NA	< 1
S-29 (0.0-0.5) DUPE	10/3/95	NA	NA	NA	NA	NA	< 1
S-30 (0.0-0.5)	10/3/95	NA	NA	NA	NA	NA	< 1
S-31 (0.0-0.5)	**10/3/95**	**1.6**	----	----	----	**1.6**	**< 4**
MB-1	9/26/95	NA	NA	NA	NA	NA	< 1
MB-2	10/3/95	NA	NA	NA	NA	NA	< 1

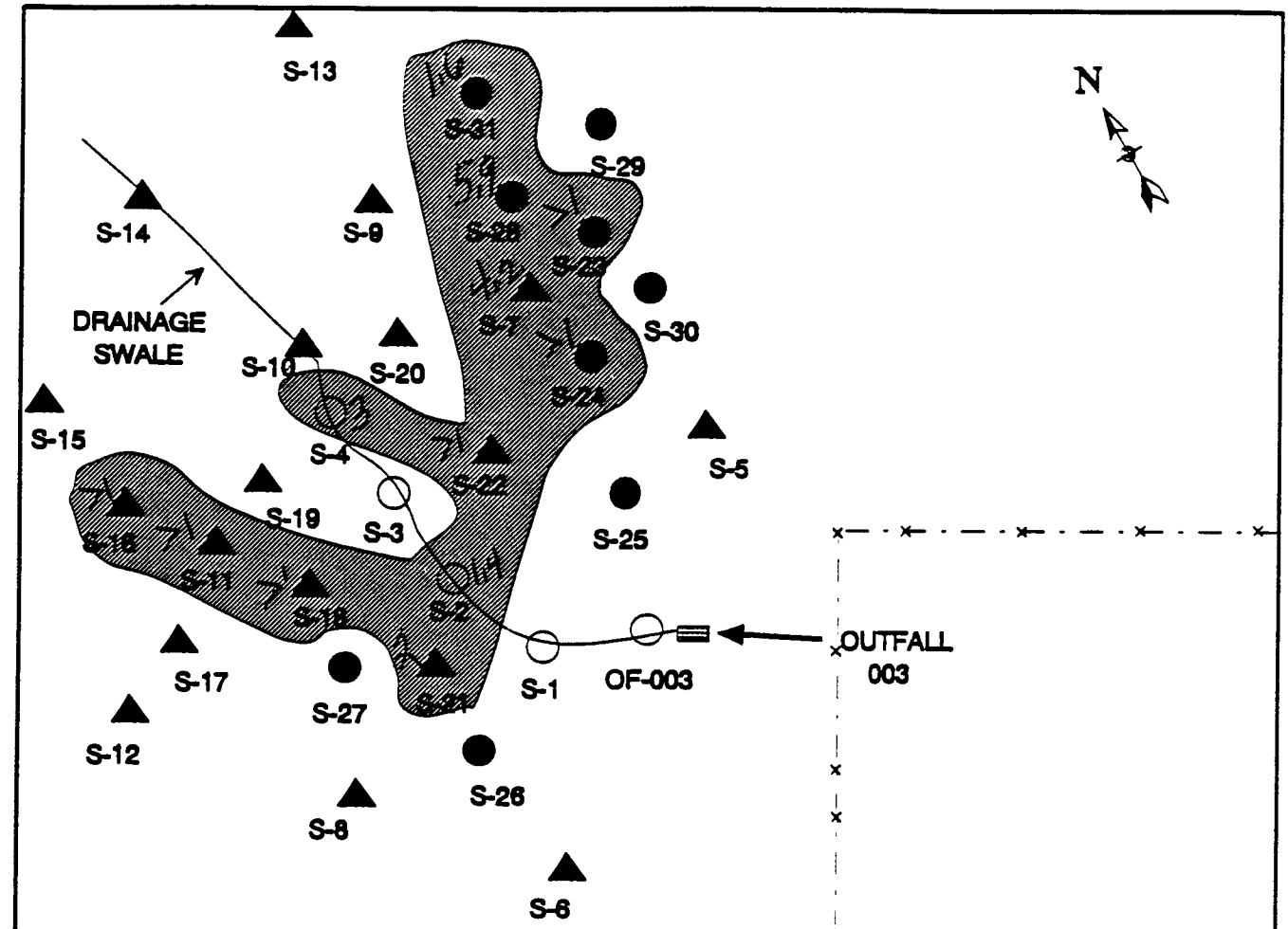
NOTES:

- samples submitted for laboratory analysis were analyzed for all Aroclors listed in USEPA Method 8080; only those Aroclors detected are included.
- * ug/g = micrograms-per-gram which are approximately equivalent to ppm = parts-per-million.
- ---- = compound not detected above detection limit by laboratory analysis of the sample.
- bold typeface/pattern indicates sample with PCBs greater than 1 ppm.
- NA = sample not analyzed by this method.
- MB = method blank.

ATTACHMENT 2

FIGURES


S-13
S-31
S-29
N
S-14
S-9
S-28
S-23
DRAINAGE SWALE
S-7
S-30
S-10
S-20
S-24
S-15
S-4
S-22
S-5
S-19
S-3
S-25
S-16
S-11
S-18
S-2
OUTFALL 003
S-17
S-1
OF-003
S-27
S-21
S-12
S-26
S-8
S-6
GARAGE
LEGEND
03/96 SOIL SAMPLING LOCATION
09/95 SOIL SAMPLING LOCATION
10/95 SOIL SAMPLING LOCATION
OUTFALL 003
FENCE
WETLAND SOIL SAMPLE LOCATIONS THROUGH 3 OCTOBER 1995
PREPARED FOR:
MARTIN MARIETTA CORPORATION
ERM
SCALE
1" = 20'
FIGURE
1
DATE
OCTOBER 1995
GATEWAY:C:\PROJECTS\LMC\PCBSAMP6.DRW



LEGEND

- ○ 03/95 SOIL SAMPLING LOCATION
- ▲ 09/95 SOIL SAMPLING LOCATION
- ● 10/95 SOIL SAMPLING LOCATION
- ▭ OUTFALL 003
- — · × · — FENCE
- AREA OF SOIL WITH PCBs > 1 PPM (FIELD SCREENING AND/OR LAB DATA)

WETLAND SOIL SAMPLE LOCATIONS
AREAS WITH PCBs > 1 PPM

PREPARED FOR: MARTIN MARIETTA CORPORATION

ERM

SCALE: 1" = 20'

DATE: OCTOBER 1995

FIGURE: 2

GATEWAY\C:\PROJECTS\LMC\PCBSAMP5.DRW

ATTACHMENT 3

FIELD SCREENING DATA SHEETS

PCB FIELD SCREENING DATA SHEET

Site Name: LMC - FRP
Date: 9/26/95

ERM Job Number: 557.0440.3
Analyst: J. Fox

ERM

Number	Sample ID	Dilution Scale	Optical Density	Concentration (ppm)	Comment
1	LMC-FRP-S9(0-0.5)	1	+0.48	< 1	plant roots/debris (trace)
	"	10	+0.68	< 10	
2	LMC-FRP-S10(0-0.5)	1	+0.13	< 1	trace plant roots/debris
	"	10	+0.72	< 10	
3	LMC-FRP-S11(0-0.5)	1	-0.48	> 1	trace plant roots/debris
	"	10	+0.49	< 10	
4	LMC-FRP-MB1	1	+0.65	< 1	Method Blank (no
	"	10	+0.63	< 10	soil added)
5	LMC-FRP-S12(0-0.5)	1	+0.52	< 1	trace plant roots/debris
	"	10	+1.04	< 10	
6	LMC-FRP-S13(0-0.5)	1	+0.60	< 1	little plant roots/debris
	"	10	+0.67	< 10	
7	LMC-FRP-S14(0-0.5)	1	+0.12	< 1	trace plant roots/debris
	"	10	+0.73	< 10	
8	LMC-FRP-S15(0-0.5)	1	+0.48	< 1	trace plant roots/debris
	"	10	+0.71	< 10	
9	LMC-FRP-S5(0-0.5)	1	+0.85	< 1	trace plant roots
	"	10	+1.09	< 10	
10	LMC-FRP-S6(0-0.5)	1	+0.74	< 1	trace plant roots/debris
	"	10	+1.15	< 10	
11	LMC-FRP-S7(0-0.5)	1	-0.14	> 1	trace plant roots
	"	10	+0.99	< 10	
12	LMC-FRP-S8(0-0.5)	1	+0.50	< 1	trace plant roots/debris
	"	10	+1.00	< 10	
13	LMC-FRP-S16(0-0.5)	1	-0.31	> 1	trace plant roots
	"	10	+0.66	< 10	
14	LMC-FRP-S17(0-0.5)	1	+0.53	< 1	trace plant roots
	"	10	+0.93	< 10	

diff. between standard = -0.15

diff. between standard = -0.04

diff. between standard = 0.03

See page 2

CONTINUED

Signature: Jon K. Fox

Date: 9/26/95

PCB FIELD SCREENING DATA SHEET

Site Name: LMC-FRP
Date: 9/26/95

ERM Job Number: 5520443
Analyst: J. Fox

ERM

Number	Sample ID	Dilution Scale	Optical Density	Concentration (ppm)	Comment
15	LMC-FRP-S18(0-0.5)	1	-0.41	> 1	trace plant roots
	"	10	+0.47	< 10	
16	LMC-FRP-S19(0-0.5)	1	+0.17	< 1	trace plant roots
	"	10	+0.77	< 10	
17	LMC-FRP-S20(0-0.5)	1	+0.11	< 1	trace plant roots
	"	10	+0.60	< 10	
18	LMC-FRP-S21(0-0.5)	1	-0.07	> 1	trace plant roots/debris
	"	10	+0.58	< 10	
19	LMC-FRP-S22(0-0.5)	1	-0.25	> 1	trace plant roots/debris
	"	10	+0.43	< 10	
20	LMC-FRP-S11(0-0.5)	1	-0.29	> 1	Run as duplicate
	"	10	+0.30	< 10	trace plant roots/debris

diff. between standards = -0.05

diff between standards = -0.01

Signature: Jan F. Fox

Date: 9/26/95

PCB FIELD SCREENING DATA SHEET

Site Name: LMC - FRP
Date: 10/3/95

ERM Job Number: 557.044.03
Analyst: J. Fox

ERM

Number	LMC Sample ID	Dilution Scale	Optical Density	Concentration (ppm)	Comment
21	ERP-FRP-S23(0-0.5)	1	- 0.07	> 1	plant roots / debris
	"	10	+ 0.87	< 10	
22	LMC-FRP-S24(0-0.5)	1	- 0.05	> 1	plant roots / debris
	"	10	+ 0.61	< 10	
23	LMC-FRP-S25(0-0.5)	1	+ 0.12	< 1	plant roots / debris
	"	10	+ 0.43	< 10	
24	LMC-FRP-MB2	1	+ 0.89	< 1	Method Blank (no
	"	10	+ 0.85	< 10	soil added).
25	LMC-FRP-S26(0-0.5)	1	+ 0.15	< 1	plant roots
	"	10	+ 0.56	< 10	
26	LMC-FRP-S27(0-0.5)	1	+ 0.13	< 1	plant roots/debris
	"	10	+ 0.59	< 10	
27	LMC-FRP-S29(0-0.5)	1	+ 0.56	< 1	plant roots
	"	10	+ 0.68	< 10	
28	LMC-FRP-S29 (0-0.5)	1	+ 0.36	< 1	duplicate analysis
	"	10	+ 0.51	< 10	of sample #27
29	LMC-FRP-S28(0-0.5)	1	- 0.63	> 1	plant roots
	"	10	+ 0.34	< 10	
30	LMC-FRP-S30(0-0.5)	1	+ 0.28	< 1	plant roots
	"	10	+ 0.50	< 10	
31	LMC-FRP-S31(0-0.5)	1	+ 0.05	< 1	plant roots / debris
	"	10	+ 0.68	< 10	

diff. between standards = - 0.00

diff. between standards = - 0.01

diff. between standards = - 0.03

diff. between standards = - 0.04

Signature: Jon F Fox

Date: 10/3/95

Attachment 9

Letter from NYSDEC to LMC dated January 19, 1996

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

Michael D. Zagata
Commissioner

January 19, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Martin Marietta Corporation
Bldg. 5, Room H6
Electronics Park
Syracuse, New York 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have reviewed the Remedial Investigation (RI) Report Addendum, Soil Sampling in the Wetlands Adjacent to Outfall 003, and have the following comments:

- Initial RI Sampling Results:

  The results of the initial RI samples collected at outfall 003 are needed for accurate interpretation of the analytical data. These results are to be included in Table 1, and the results must be incorporated in Figure 2, showing extent of PCB contamination.

- Cleanup Objectives:

  The cleanup objectives contained in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 are based upon protection of human health and groundwater, and as such can not be considered to be protective of fish and wildlife. The samples were collected in a Class 1 wetland, where by observation, "insects and annelids were commonly present in the soil." In such communities, PCBs are known to biomagnify in the food chain and can pose a hazard to wildlife. The level of protection for wildlife bioaccumulation contained in the NYSDEC Technical Guidance for Screening Contaminated Sediment (22 November 1993) is 1.4 μg/gOC or, using the value of 9.1% organic carbon, 127 μg/kg. This level would be more appropriate for the wetland, and must be considered.

PCB Analytical Results:

A discussion of PCB concentrations as a function of sample depth should be included.

- PCB Analytical Results, 2nd paragraph: This paragraph must be revised in accordance with the following comments:

  - The statement that the affected area has no definitive directional trend is not in accordance with the topography in the sampling area. Based upon observations made during the sampling, the affected area (including the RI sample results) appears to follow the flow of water down the drainage swale to an area where the drainage swale is partially blocked. The water then flows into lower areas to either side of the drainage swale, while still trending in the same direction.

  - We do not agree with the statement that the source of Aroclors 1242 and 1248 may be related to another source such as periodic flooding of the Seneca River. It is more probable that the differences in the two rounds of sampling are related to differences in analytical interpretations. Distinguishing between the different congeners of weathered PCBs is highly interpretive, as the retention times are shifted from the unweathered congeners, and the retention times overlap.

- Given the elevated detection limits in the second round of sampling, additional pre-design sampling may be needed to confirm the extent of contamination to the north-northeast of S-31, and to the west of S-16.

If you have any questions, please contact me at 518/457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, DOH
S. Lee Fenske, Esq.
V. Robbins, Esq.

Attachment 10

Letter from LMC to NYSDEC dated February 29, 1996

Lockheed Martin
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

By Telecopy
(518) 457-3972

February 29, 1996

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

RE: Response to NYSDEC Comment Letter dated January 19, 1996
Remedial Investigation Report Addendum
Soil Sampling in the Wetland Adjacent to Outfall 003
Farrell Road Site, Town of Geddes, Onondaga County, New York
NYSDEC Site No. 734055

Dear Mr. Schick:

This letter is in response to the New York State Department of Environmental Conservation (NYSDEC) comment letter dated January 19, 1996 regarding the soil sampling in the wetland adjacent to outfall 003 at the Farrell Road Site.

For purposes of clarity, the original NYSDEC comment is presented followed by Lockheed Martin Corporation's (LMC) response.

NYSDEC Comment 1 - Initial RI Sampling Results

The results of the initial RI samples collected at outfall 003 are needed for accurate interpretation of the analytical data. These results are to be included in Table 1, and the results must be incorporated in Figure 2, showing extent of PCB contamination.

LMC Response

As requested, LMC will include the analytical data from outfall 003 collected during the Remedial Investigation (RI) in Table 1 and Figure 2 of the RI Report Addendum. Three samples collected during the RI were designated FRP-OUT-03A, FRP-OUT-03B, and FRP-OUT-03C. Samples 03A and 03B were collected directly in front of the outfall at the surface and at a depth of one foot below grade respectively. Sample 03C was collected from the surface soil approximately 12 feet downgradient of the outfall.

NYSDEC Comment 2 - Cleanup Objectives

The cleanup objectives contained in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 are based upon protection of human health and groundwater, and as such can not be considered to be protective of fish and wildlife. The samples were collected in a Class 1 wetland, where by observation, "insects and annelids were commonly present in the soil." In such communities, PCBs are known to biomagnify in the food chain and can pose a hazard to wildlife. The level of protection for wildlife bioaccumulation contained in the NYSDEC Technical Guidance for Screening Contaminated Sediment (22 November 1993) is 1.4 ug/gOC or, using the value of 9.1% organic carbon, 127 ug/kg. This level would be more appropriate for the wetland, and must be considered.

LMC Response

LMC has reviewed the NYSDEC Technical Guidance for Screening Contaminated Sediments dated November 22, 1993 ("Guidance") and the Fish and Wildlife Impact Analysis included in the RI Report. In addition, LMC has considered NYSDEC comments regarding a cleanup level for PCBs of 127 ug/kg. LMC offers the following information to support the position that a value of 127 ug/kg is not an appropriate cleanup level.

As discussed in previous correspondence, LMC disagrees that the use of the sediment screening criteria contained in the Guidance is appropriate for the soil of a periodically flooded wetland. The Guidance applies to aquatic ecosystems and is not appropriate for soil located in a flood plain forest. As stated on page 2 of the Guidance, "Sediment can be loosely defined as a collection of fine, medium and course grained minerals and organic particles that are found at the bottom of lakes (and ponds), rivers (and streams), bays, estuaries and oceans (Adams et.al., 1992)." The Guidance further states that sediment "provide habitat for a wide variety of benthic organisms." It is clear from this definition that the Guidance was intended for an aquatic system and not flood plain soil.

The samples collected from the wetland were collected from the Wayland silt and loam soil as described by the United States Department of Agriculture Soil Conservation Service Soil Survey of Onondaga County (January 1977). Benthic organisms were not present in the soil and the soil development was consistent with the Soil Conservation Corps description. In fact, the area in question is heavily wooded with mature trees closely spaced and has limited accessibility. LMC believes that the area adjacent to outfall 003 does not support an aquatic ecosystem.

The Department may not apply the Guidance document as a regulatory standard. The Guidance provides guidelines for assessing sediment containing chemical constituents and screening levels to be used in an initial assessment. Moreover, in applying the guidelines the NYSDEC is required to consider site specific conditions.

The values presented in the Guidance are sediment screening levels only and do not constitute cleanup levels. As stated on page i of the Guidance, "Sediments with contaminant concentrations that exceed the criteria listed in this document are considered to be contaminated, and potentially causing harmful impacts to marine and aquatic ecosystems. These criteria do not necessarily represent the final concentrations that must be achieved through sediment remediation." Thus, NYSDEC considers these screening values to apply only to sediments and does not consider these values to be final cleanup levels.

Notwithstanding the foregoing, the need for PCB remediation in the wetland should be based on the results of a comprehensive sampling program, technical practicability and risk management. LMC believes that a comprehensive sampling program has been conducted. Soils from a total of 37 sample locations at varying depths (representing just over 0.1 acre) have been analyzed resulting in a range of total PCB concentrations of less than 1 ppm to 5.9 ppm.

Further, LMC believes that remedial efforts for soils in the wetland adjacent to outfall 003 will not achieve a soil cleanup level of 1 ppm or less, due to the nature of the wetland (limited accessibility and wooded vegetation) without significant adverse environmental impact. As previously stated, the area of affected soil in the wetland adjacent to outfall 003 consists of a heavily wooded area. Removal of soil from among and between mature trees (including the root zones) would be extremely difficult and may not be achievable without wholesale clearing of the area. Relative to the issue of risk management, LMC believes that removal of PCB affected soil to a 0.127 ppm PCB level would do more harm to the environment (through disturbance of the wetland) than the incremental benefit associated with reducing the PCB level from 1 ppm to 0.127 ppm.

As such LMC will consider remediation of soil in the wetland adjacent to outfall 003 for soil containing PCB concentrations greater than 1 ppm as required in TAGM 4046 in the Feasibility Study (FS). We anticipate that the same issues relating to technical practicability and cost/benefit to the wetland will likely apply and be evaluated as part of the FS.

NYSDEC Comment 3 - PCB Analytical Results

A discussion of PCB concentrations as a function of sample depth should be included.

LMC Response

As requested, LMC will include a discussion of the vertical distribution of PCB concentrations in the PCB Analytical Results Section of the RI Report Addendum. The issue of PCB concentrations as a function of sample depth was resolved during the first round of sampling. The results of the first round of sampling are presented in a letter from LMC to NYSDEC dated July 5, 1995. It was determined at that time that PCBs may be a concern in the near surface soil and did not penetrate into the subsurface. NYSDEC did not require any samples below grade in their response letter dated August 7, 1995. The results as stated in LMC's July 5, 1995 letter will be reiterated in the final draft of the RI Report Addendum.

NYSDEC Comment 4a - PCB Analytical Results, 2nd Paragraph: This paragraph must be revised in accordance with the following comments:

The statement that the affected area has no definitive directional trend is not in accordance with the topography in the sampling area. Based upon observations made during the sampling, the affected area (including the RI sample results) appears to follow the flow of water down the drainage swale to an area where the drainage swale is partially blocked. The water then flows into lower areas to either side of the drainage swale, while still trending in the same direction.

LMC Response

Field observations during investigative activities indicate that a fallen log crossed the swale at a location downstream of the outfall. However, there was no indication of ponding, such as a change of vegetation type or widespread accumulation of debris that would suggest prior ponding. In the absence of a detailed topographic survey, or observations during periods of discharge, it is entirely speculative whether the distribution of PCBs in the soil are controlled by ponding or flow in the drainage swale associated with outfall 003. LMC does not believe it is appropriate to modify the 2nd paragraph in the PCB Analytical Results Section of the RI Report Addendum.

NYSDEC Comment 4b

We do not agree with the statement that the source of Aroclors 1242 and 1248 may be related to another source such as periodic flooding of the Seneca River. It is more probable that the differences in the two rounds of sampling are related to differences in analytical interpretations. Distinguishing between the different congeners of weathered PCBs is highly interpretive, as the retention times are shifted from the unweathered congeners, and the retention times overlap.

LMC Response

The results of investigative activities are inconclusive whether the presence of PCBs resulted from a weathered PCB spill, an off-site source, or due to laboratory interpretation. LMC considers all explanations for the congeners 1242 and 1248 equally probable. LMC will modify the 2nd paragraph in the PCB Analytical Results Section of the RI Report Addendum to reflect all possible explanations for the presence of congeners 1242 and 1248.

NYSDEC Comment 5

Given the elevated detection limits in the second round of sampling, additional pre-design sampling may be needed to confirm the extent of contamination to the north-northeast of S-31, and to the west of S-16.

LMC Response

LMC does not agree with NYSDEC's rationale for additional sampling. The area of affected soil, as described in the RI Report Addendum, is defined by PCB concentrations greater than 1 ppm. The exact limits of the area to be remediated are not required at this point in the remediation program. The extent of soil remediation, if any, can be estimated based on the existing data. The exact area of remediation can be determined during the remediation program with confirmation sampling and real-time onsite PCB immunoassay screening technology. The sampling adjacent to outfall 003 identified low-level PCBs in the wetland. We do not believe that any areas of higher PCB concentration will be identified at locations farther away from the outfall. LMC does not anticipate conducting any additional soil sampling in the wetland.

After you have had an opportunity to review these responses, please contact me at (315) 456-3199 if you have any questions or require additional information. Once NYSDEC indicates approval of the proposed revisions as set forth in this letter, the RI Report Addendum will be modified and a final draft will be issued.

We recognize that there continues to be disagreement between NYSDEC and LMC regarding PCB cleanup levels in the wetland. If necessary, to assist in resolving this issue, LMC would be available to meet with NYSDEC to further discuss.

Sincerely,

Patrick Salvador

Patrick D. Salvador, P.E.
Principal Engineer

c: Director, Bureau of Environmental Exposure Investigation - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henrietta Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Daniel Palm - NYSDEC, Region 7
Virginia C. Robbins, Esq. - Bond, Schoeneck & King, LLP

Attachment 11

Letter from NYSDEC to LMC dated March 29, 1996

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

Michael D. Zagata
Commissioner

March 29, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Martin Marietta Corporation
Bldg. 5, Room H6
Electronics Park
Syracuse, New York 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055: Outfall 003

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have reviewed the February 29, 1996 response to our comments on the Soil Sampling in the Wetlands Adjacent to Outfall 003 RI Report Addendum, and have the following comments:

Comment 1. Cleanup Objectives:

As discussed at the meeting on March 12, 1996, we propose that the extent of remediation be determined by area, rather than by cleanup objectives. On the attached figure are shown proposed boundaries for the remediation, for consideration in the Feasibility Study.

We believe that it is possible to remove the top foot of soil from among and between mature trees with minimal harm to the wetland.

Comments 4 and 5:

As stated in the RI Addendum, the detection limit for the field screening samples collected in the last round of sampling was not 1 ppm, but 2 to 4 ppm. Additionally, one analytical sample (S-31) and one field screening sample (S-16) on the edges of the study area exceeded 1 ppm. Therefore, the area with PCB concentrations greater than 1 ppm was not fully defined. If the model for contaminant spread is that PCBs from the outfall were carried down the drainage swale during rainfall events and deposited in an area of ponded water, then the extent of PCB contamination can probably be estimated from the existing data. If, however, the source of the PCB contamination located at a distance from the outfall is assumed to be unrelated to the outfall, then the assumption that PCB

concentrations decrease with distance from the outfall cannot be made, and additional sampling to delineate the extent of contamination is necessary.

The NYSDEC believes the media sampled should be characterized as sediment, not soil, particularly the sediments within the drainage swale.

Please send the revised pages of the RI Addendum for review. If you have any questions, please contact me at 518/457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, DOH
S. Lee Fenske, Esq.
V. Robbins, Esq.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

Michael D. Zagata
Commissioner

April 1, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Martin Marietta Corporation
Bldg. 5, Room H6
Electronics Park
Syracuse, New York 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055: Outfall 003

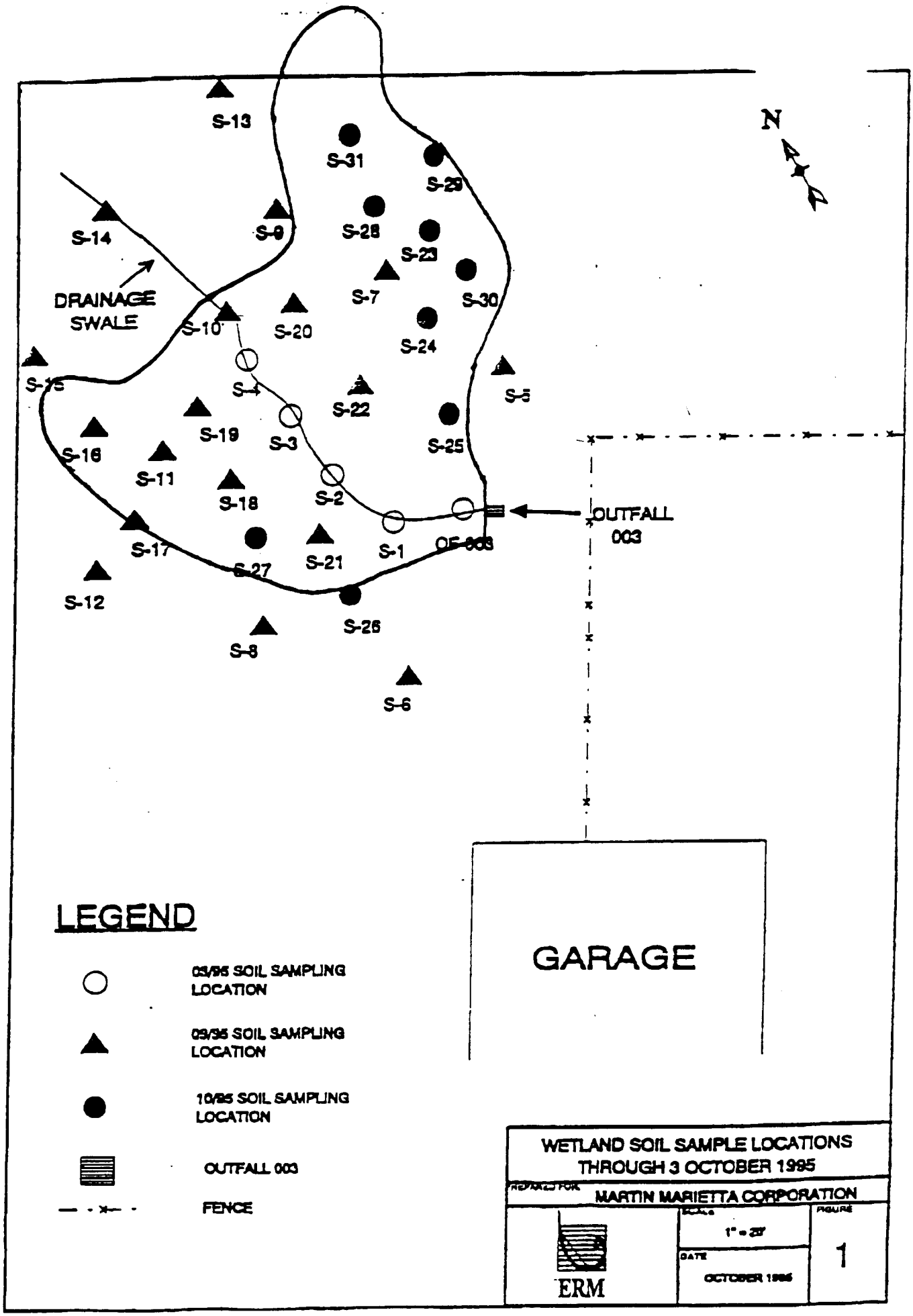
Enclosed is the figure which was inadvertently omitted from my March 29, 1996 letter regarding Outfall 003.

If you have any questions, please contact me at 518/457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, DOH
S. Lee Fenske, Esq.
V. Robbins, Esq.


S-13
S-31
S-29
S-14
S-9
S-28
S-23
S-7
S-30
DRAINAGE SWALE
S-10
S-20
S-24
S-15
S-4
S-22
S-5
S-19
S-3
S-25
S-16
S-11
S-18
S-2
OUTFALL 003
S-17
S-27
S-21
S-1
05-003
S-12
S-26
S-8
S-6
N
GARAGE
LEGEND
03/95 SOIL SAMPLING LOCATION
03/95 SOIL SAMPLING LOCATION
10/95 SOIL SAMPLING LOCATION
OUTFALL 003
FENCE
WETLAND SOIL SAMPLE LOCATIONS THROUGH 3 OCTOBER 1995
PREPARED FOR: MARTIN MARIETTA CORPORATION
ERM
SCALE: 1" = 25'
DATE: OCTOBER 1995
FIGURE: 1

Attachment 12

Letter from LMC to NYSDEC dated May 2, 1996

Lockheed Martin
Ocean, Radar & Sensor Systems
Post Office Box [illegible] Syracuse, NY [illegible]

LOCKHEED MARTIN

By Telecopy
(518) 457-3972

May 2, 1996

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Re: Response to NYSDEC Comment Letter Dated March 29, 1996
Remedial Investigation Report Addendum
Soil Sampling in the Wetland Adjacent to Outfall 003
GE Farrell Road Site, Town of Geddes, Onondaga County, New York
NYSDEC Site No. 734055

Dear Mr. Schick:

This letter is in response to the New York State Department of Environmental Conservation's (NYSDECs) comment letter dated March 29, 1996 (including NYSDECs April 1, 1996 supplemental letter) regarding the soil sampling in the wetland adjacent to Outfall 003 at the Farrell Road Site.

For purposes of clarity, the original NYSDEC comment is presented followed by Lockheed Martin Corporation's (LMC's) response.

NYSDEC Comment 1 - Cleanup Objectives

As discussed at the meeting on March 12, 1996, we propose that the extent of remediation be determined by area, rather than by cleanup objectives. On the attached figure are shown proposed boundaries for the remediation, for consideration in the Feasibility Study.

We believe that it is possible to remove the top foot of soil from among and between mature trees with minimal harm to the wetland.

LMC Response

LMC concurs with the NYSDEC that defining the extent of remediation for the soils adjacent to Outfall 003 by area rather than by cleanup objectives is an effective remedial approach. Although the horizontal area delineated by NYSDEC for remediation is significantly larger than the area presented in Figure 2 of LMCs November 29, 1995 report, LMC agrees to remediate the area proposed in the NYSDECs March 29, 1996 letter. Remediation will be completed by removing the top foot of soil from within the defined area. To more easily define the area to be remediated and complete the remediation, LMC may elect to remove soil from beyond the area proposed by the NYSDEC; the remediation area will include, at a minimum, the entire area proposed by the NYSDEC. The removed soil will be transported off-site for disposal.

As discussed below, LMC proposes to implement an Interim Remedial Measure (IRM) to remove and dispose of the soils (as defined in the NYSDECs March 29, 1996 letter) adjacent to Outfall 003

rather than consider this remediation as part of the Feasibility Study (FS). Completion of this IRM will be presented in the FS as the final remedy for the soils adjacent to Outfall 003.

NYSDEC Comment 2 - Comments 4 and 5

As stated in the RI Addendum, the detection limit for the field screening samples collected in the last round of sampling was not 1 ppm, but 2 to 4 ppm. Additionally, one analytical sample (S-31) and one field screening sample (S-16) on the edges of the study area exceeded 1 ppm. Therefore, the area with PCB concentrations greater than 1 ppm was not fully defined. If the model for contaminant spread is that PCBs from the outfall were carried down the drainage swale during rainfall events and deposited in the area of ponded water, then the extent of PCB contamination can probably be estimated from the existing data. If, however, the source of the PCB contamination located at a distance from the outfall is assumed to be unrelated to the outfall, then the assumption that PCB concentrations decrease with distance from the outfall cannot be made, and additional sampling to delineate the extent of contamination is necessary.

LMC Response

As previously discussed in LMC's February 29, 1996 correspondence, LMC will modify the RI Report Addendum to reflect all possible explanations for the presence of Aroclors 1242 and 1248. LMC believes that the extent of affected soil adjacent to Outfall 003 has been delineated and, therefore, no additional sampling is proposed. LMC proposes to remediate the area defined in the NYSDECs letter dated March 29, 1996 as an IRM.

NYSDEC General Comments

The NYSDEC believes the media sampled should be characterized as sediment, not soil, particularly the sediments within the drainage swale.

LMC Response

As discussed in previous correspondence, LMC believes that the media adjacent to Outfall 003 should be characterized as soil. While NYSDEC and LMC continue to disagree on this issue, resolution of this item is not required to proceed with remediation of the affected media as discussed in LMC response to NYSDEC, Comment 1.

Conclusion

As discussed with Catherine Klatt in recent telephone conversations, LMC proposes to conduct an IRM to remediate affected soil adjacent to Outfall 003. The IRM will consist of removing the upper foot of soil within a defined remediation area. As described above, the remediation area will include the area proposed in the NYSDECs March 29, 1996 letter. LMC proposes to complete the IRM in accordance with the requirements of the existing Order on Consent for the Farrell Road Plant (Index #A7-0307-93-10). Pursuant to that Order, an IRM Work Plan will be prepared which describes the methods and procedures to be implemented while performing the IRM, including background information related to the Outfall 003 investigation, a description of the IRM activities, an engineering contingency plan, a health and safety plan and a description of the citizen participation activities. Since the proposed remediation area has been delineated and the extent of remediation is being defined by area rather than cleanup objectives (see response to NYSDEC Comment 1), no sampling is required for the IRM; accordingly, a sampling and analysis plan will not be prepared as part of the IRM Work Plan. The sole remedial action objective (RAO) of the IRM is to remove soils to a depth of one foot within the defined area for off-site transport and disposal. The removed soils will be replaced with soil from an off-site location. To accomplish the RAO the following conceptual IRM work description is offered for NYSDEC's consideration.

IRM Conceptual Work Description

The extent of the soil removal will include at a minimum the horizontal extent delineated in NYSDEC's March 29, 1996 letter. To minimize impacts to the wetland, LMC proposes to complete the IRM during the dry weather months (i.e., summer); the IRM will not be performed while the area to be remediated is flooded or wet. Dry soil conditions will reduce the potential transport of disturbed soil beyond the excavation area and reduce soil disturbance due to ingress and egress of manpower and equipment to the remediation area. The minimum horizontal extent of remediation will be established using the existing sample location markers. This area may be extended to simplify delineation of the perimeter of the remediation area.

Access to the remediation area may require the construction of a temporary access road or use of wooden construction mats. In addition, access may require some clearing of small diameter standing trees (large, mature trees will not be removed as part of the proposed IRM). Any construction and clearing activities proposed in the wetland will be limited to the extent practical to reduce impacts to the wetland. In general, soil removal will be accomplished by use of standard construction equipment (e.g., backhoe) and manual shoveling. Soil removal activities will be conducted in a manner which will limit the disturbance of mature trees and root systems within the remediation area. Removed soil will be transported from the wetland and either stockpiled or placed directly into rolloff containers for temporary storage prior to off-site transport and disposal. Final disposition of the removed soil will be based on the existing analytical data and additional characterization data required by the disposal facility (if any). Following soil removal the remediation area will be backfilled with soil from an off-site source and graded to match the surrounding grade. No additional restoration activities will be completed in the wetland.

All IRM field activities will be observed by an LMC representative and documented in an IRM Certification Report to be signed and sealed by a professional engineer. The completed IRM will be identified in the FS as the final remedy for soils adjacent to Outfall 003. Upon NYSDEC concurrence of the conceptual work description provided above, LMC will proceed with the preparation of an IRM Work Plan. The IRM Work Plan will be submitted to NYSDEC for review and approval.

Following NYSDEC approval of the specific responses to NYSDEC comments, LMC will reissue a revised RI Report Addendum. Please contact me at (315) 456-3199 if you have any questions or require additional information.

Sincerely,

Patrick D. Salvador

Patrick D. Salvador, P.E.
Principal Engineer

3496842.N

cc: Director, Bureau of Environmental Exposure Investigation - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin Corporation
Henriette Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Daniel Palm, Director - NYSDEC
Virginia C. Robbins, Esq. - Bond, Schoeneck & King, LLP

Attachment 13

Letter from NYSDEC to LMC dated June 28, 1996

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

Michael Zagata
Commissioner

June 28, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
Bldg. 5, Room H6
Electronics Park
Syracuse, NY 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055: Outfall 003

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have reviewed your letter of May 2, 1996, regarding the soil sampling in the wetland adjacent to Outfall 003. We agree with your proposal to implement the removal of PCB-contaminated soil as an IRM rather than considering this proposal in the Feasibility Study (FS).

While NYSDEC and Lockheed Martin Corporation (LMC) continue to disagree as to the most probable source of the PCBs and the characterization of the media as sediment or soil, resolution of these issues are not necessary to implement the IRM.

Conceptual Work Description

The NYSDEC concurs with the conceptual work description, with the following exceptions:

Depth of Excavation: Since the PCB concentrations exceed 1 ppm in the sediments 1 foot deep directly adjacent to the outfall (sample OUT-03B), the excavation should be 1.5 feet deep in this area. This will add an estimated 0.2 cy to the excavation volume.

Wetland restoration: While a permit to conduct work in a regulated wetland is not required, the substantive conditions of such a permit must be met. The Division of Fish and Wildlife (DFW) has provided the following requirements for restoration of the wetland following the removal action:

1. The top 4 inches of backfill should be topsoil.

2. An equal number of trees and shrubs destroyed during remediation will be replaced by wetland species presently found at the site (with the plants obtained from a commercial grower, not from an on-site wetland area), or other suitable wetland species such as:

   Trees: Red Maple - *Acer rubrum*
   Silver Maple - *Acer sadcharinum*
   Black Willow - *Salix niger*

   Shrubs: Highbush blueberry - *Vaccinium corymbosum*
   Silky Dogwood - *Cornus amonum*
   Red-Osier Dogwood - *Cornus stolonifera*

3. The disturbed wetland area will be mulched and seeded with a suitable wetland grass such as:

   Switchgrass - *Panicum virgatum*
   Redtop - *Agrostis alba*
   Paniograss - *Panicum agrostoides*

Please submit the revised RI Report Addendum and the IRM Work Plan. If you have any questions, please contact me at 518/457-4343.

Sincerely,

Catherine A. Klatt

Catherine A. Klatt
Project Engineer
Bureau of Western Remedial Action
Division of Environmental Remediation

cc: H. Hamel, DOH
S. Lee Fenske, Esq.
V. Robbins, Esq.

Attachment 14

Letter from LMC to NYSDEC dated July 25, 1996

LOCKHEED MARTIN

By: Overnight Courier

July 25, 1996

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Re: Soil Remediation Adjacent to Outfall 003; IRM Work Plan
GE Farrell Road Site; Town of Geddes, Onondaga County, New York
NYSDEC Site #734055

Dear Mr. Schick:

Enclosed please find four copies of the Interim Remedial Measures (IRM) Work Plan for remediating soil adjacent to Outfall 003 at the above-referenced site. This IRM Work Plan was prepared in accordance with the NYSDEC Order on Consent (Index #A7-0307-93-10), dated December 15, 1993.

This IRM has been developed based on the results of the Remedial Investigation and correspondence between NYSDEC and Lockheed Martin. We look forward to the Department's approval to proceed with implementing the proposed IRM in accordance with the enclosed Work Plan. Please contact me at (315) 456-3199 if you require additional information.

Sincerely,

Patrick D. Salvador

Patrick D. Salvador, P.E.
Principal Engineer

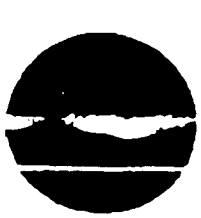
Enclosure

cc: Director, Bureau of Environmental Exposure Investigation - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henriette Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Mr. Daniel Palm, Director - NYSDEC
Virginia Robbins, Esq., - Bond, Schoeneck & King, LLP

Attachment 15

Letter from NYSDEC to LMC dated August 2, 1996

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



Michael Zagata
Commissioner

ugust 2, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Martin Marieta Corporation
Bldg. 5, Room H6
Electronic Park
Syracuse, New York 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have completed the review of the "Farrell Road Plant Outfall 003 Interim Remedial Measure Work Plan" dated July 1996, submitted by Lockheed Martin Corporation. Based upon this review the following comments have resulted:

1- Section 2.3: Provision must be included for the review of the Contractor's Work plan by the State prior to the initiation of fieldwork. This is required since the final health and safety plan and a other aspects of the final project such as the access road design and location, staging area location and design, and silt fence have been left up to the contractor to propose in their Work plan. The schedule in Section 2.11 should be modified to reflect this submittal and review.

2- Section 2.4: The sediment control should be a silt fence and hay bales. The approximate limits of the silt fence should be shown on Figure 3 and the figure referenced in this section.

3- Section 2.6: The polyethylene lined staging area should include a raised curb or other form of berm and a sump for the collection of any water generated. Provisions to cover the material or otherwise prevent dust generation as well as measures to control runoff or water entering the staging area during a rainfall event must also be included in the contractors Work plan and should be noted in this section.

4- Section 2.6: The plan should specifically state that the access road will be restored with appropriate vegetation.

5- Section 2.11: The schedule must include the State review and approval of the Contractor's Work Plan.

6- Section 4 Health and Safety Requirements: This section should include the required community health and safety aspect of the HASP, which in this case will be geared toward protection of Syroco, Inc. workers in the facility, during the implementation of the IRM.

The Work plan is generally acceptable, and is conditionally approved pending receipt of a revised version incorporating the above comments. If you have any questions relative to these comments, please contact me directly at (518) 457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

Attachment

cc: A. Carlson - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henriette Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Daniel Palm, Director - NYSDEC
Virginia Robbins, Esq. - Bond, Schoeneck & King, LLP

Attachment 16

Letter from LMC to NYSDEC dated August 5, 1996

Lockheed Martin
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

Transmitted Via Telecopy

August 5, 1996

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Re: Soil Remediation Adjacent to Outfall 003; IRM Work Plan
GE Farrell Road Plant; Town of Geddes, Onondaga County, New York
NYSDEC Site #734055

Dear Mr. Schick:

This is in response to the New York State Department of Environmental Conservation's (NYSDEC) and New York State Department of Health's (NYSDOH) letter dated August 2, 1996 regarding the Farrell Road Plant Outfall 003 Interim Remedial Measure Work Plan (Work Plan) dated July 1996. In the August 2, 1996 letter the NYSDEC and NYSDOH provided comments based on a review of the Work Plan. Pursuant to the requirements of the Order on Consent (Index No. A7-0307-93-10), Lockheed Martin Corporation (LMC) has prepared this letter in response to the NYSDEC's/NYSDOH's comments. Each of the NYSDEC's comments is presented below followed by LMC's responses.

NYSDEC Comment 1 **Section 2.3: Provision must be included for the review of the Contractor's Work Plan by the State prior to the initiation of fieldwork. This is required since the final health and safety plan and other aspects of the final project such as the access road design and location, staging area location and design, and silt fence have been left up to the contractor to propose in their Work Plan. The schedule in Section 2.11 should be modified to reflect this submittal and review.**

LMC Response The Contractor's work plan, including the Contractor's Health and Safety Plan (HASP), will be forwarded to the NYSDEC for review prior to initiation of the field work. The project schedule in Section 2.11 of the IRM Work Plan is modified as follows to reflect this submittal and review.

• Submit IRM Work Plan	July 26, 1996
• NYSDEC Review and Approval of IRM Work Plan	August 9, 1996
• Submit Contractor Work Plan to NYSDEC	August 19, 1996
• NYSDEC Review and Approval of Contractor Work Plan	August 23, 1996
• Mobilize to the site	August 26, 1996
• Complete Field Activities	August 30, 1996
• Characterize and Dispose of Waste	September 27, 1996
• Submit IRM Certification Report	October 18, 1996

NYSDEC Comment 2 — **Section 2.4: The sediment control should be a silt fence and hay bales. The approximate limits of the silt fence should be shown on Figure 3 and the figure referenced in this section.**

LMC Response — Soil migration control will include silt fence and haybales. The approximate location of the soil migration controls is shown on the attached, revised Figure 3. As stated in the IRM Work Plan the soil removal area may be extended during the execution of the IRM to simplify the delineation of the perimeter of the remediation area. If the soil removal area is extended, the location of the soil controls will be adjusted in the field to encompass, at a minimum, the soil removal area.

NYSDEC Comment 3 — **Section 2.6: The polyethylene lined staging area should include a raised curb or other form of berm and a sump for the collection of any water generated. Provisions to cover the material or otherwise prevent dust generation as well as measures to control runoff or water entering the staging area during a rainfall event must also be included in the contractors Work plan and should be noted in this section.**

LMC Response — The Contractor will be required to construct, as part of the staging area, a raised curb or other form of berm and a sump for the collection of any water generated. The Contractor will also be required to control dust generation from the stockpiled soils and control runoff from or water entering the staging area. The control of dust and the control of water to or from the staging area during rainfall events will be provided by covering the stockpiled soil with polyethylene sheeting or other impermeable cover. In addition, the stockpiled soils will be covered whenever the Contractor is not on-site conducting the IRM (e.g., nights and weekends). The Contractor's staging area construction and dust and water controls will be provided in the Contractor's Work Plan.

NYSDEC Comment 4 — **Section 2.6: The plan should specifically state that the access road will be restored with appropriate vegetation.**

LMC Response — Any wetland area disturbed by the installation and removal of the temporary access road or construction mats will be restored in accordance with the requirements presented in Section 2.7 - Wetland Restoration, of the IRM Work Plan.

NYSDEC Comment 5 — **Section 2.11: The schedule must include the State review and approval of the Contractor's Work Plan.**

LMC Response — A modified schedule is presented in LMC's response to NYSDEC Comment 1.

NYSDEC Comment 6 — **Section 4 Health and Safety Requirements: This section should include the required community health and safety aspect of the HASP, which in this case will be geared toward protection of Syroco, Inc. workers in the facility, during the implementation of the IRM.**

LMC Response — The Contractor's HASP will be required to address protection of non-Contractor personnel which utilize the site (i.e., Syroco, Inc. workers). It is anticipated that this protection will include, at a minimum, limiting access to the IRM area and provisions for dust control. The Contractor's HASP will be submitted to the NYSDEC as part of the Contractor's Work Plan.

At this time, LMC requests that these modifications be incorporated into the IRM Work Plan and that final NYSDEC approval of the Work Plan be issued. Based on the responses contained herein and NYSDECs conditional work plan approval (provided in NYSDECs August 2, 1996 letter), LMC will continue to proceed with the proposed IRM in accordance with the modified schedule. If you have any questions, please contact me at (315) 456-3199.

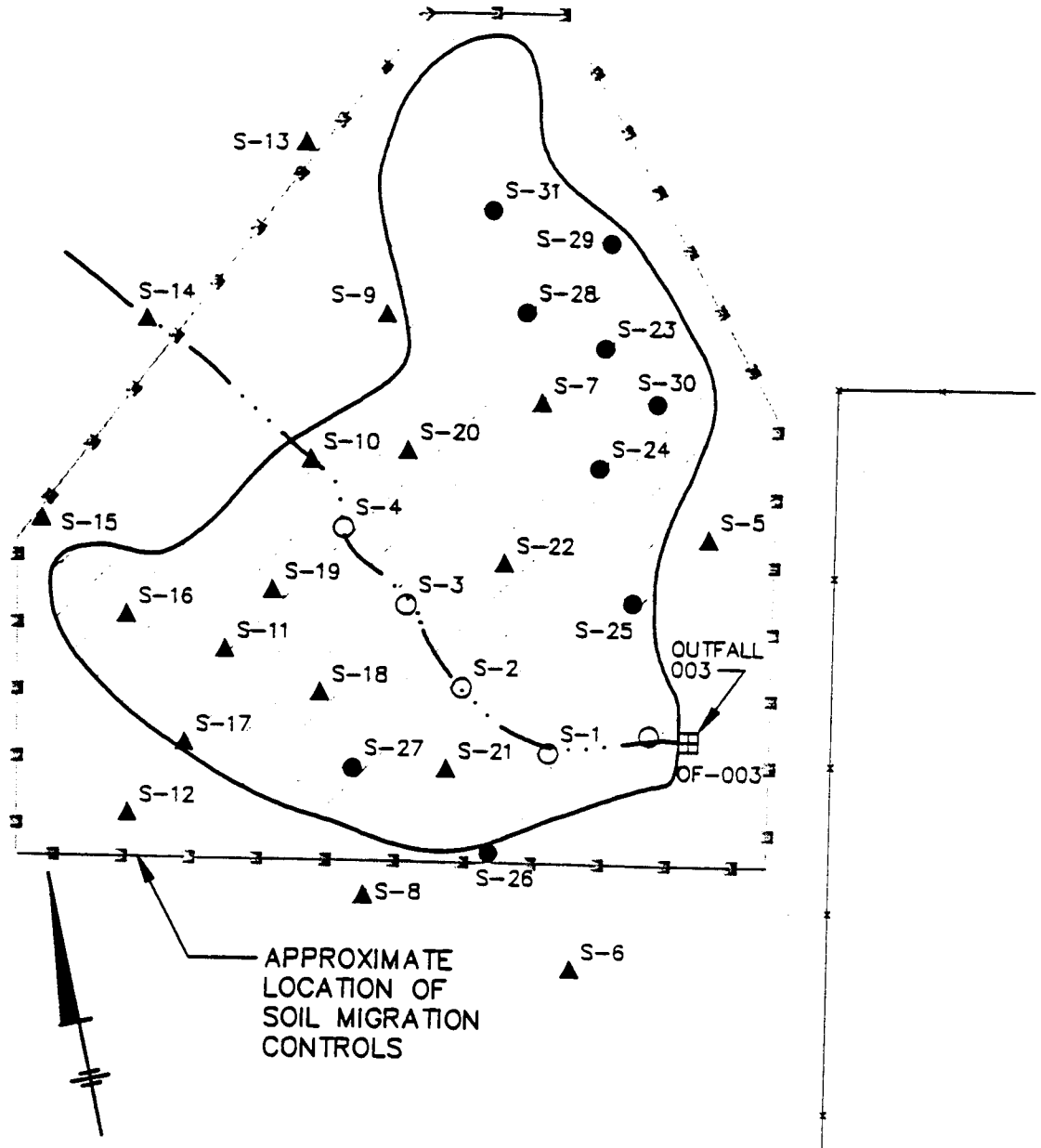
Sincerely,

Patrick Salvador

Patrick D. Salvador, P.E.
Principal Engineer

1096842.AA

cc: Director, Bureau of Environmental Exposure Investigation - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henriette Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Daniel Palm - NYSDEC
Virginia C. Robbins, Esq. - Bond, Schoeneck & King, LLP



LEGEND

- REMEDIATION AREA AS DEFINED IN NYSDEC's MARCH 29, 1996 AND APRIL 1, 1996 LETTERS
- ○ 03/95 SOIL SAMPLE LOCATION
- ▲ 09/95 SOIL SAMPLE LOCATION
- ● 10/95 SOIL SAMPLE LOCATION
- ⊞ OUTFALL 003
- DRAINAGE SWALE
- FENCE

20' 0 20'

APPROXIMATE SCALE: 1"=20'

REVISION 1: LOCATION OF SOIL MIGRATION CONTROLS ADDED PER NYSDEC's AUGUST 2, 1996 LETTER.

LOCKHEED MARTIN CORPORATION
SYRACUSE, NEW YORK
FARRELL ROAD PLANT
IRM WORK PLAN

OUTFALL 003 REMEDIATION AREA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

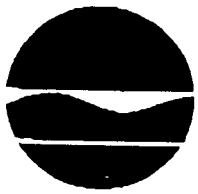
FIGURE 3

LON=*: OFF=REF
P: STD-PCP/AP
8/98 SYR-54-AK YCC
38123002/38123G02.DWG

Attachment 17

Letter from NYSDEC to LMC dated August 6, 1996

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



Michael Zagata
Commissioner

August 6, 1996

Mr. Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
Bldg. 5, Room H6
Electronic Park
Syracuse, New York 13221

Dear Mr. Salvador:

Re: GE Farrell Road Site, Geddes, Onondaga County, New York, Site No. 7-34-055

The New York State Department of Environmental Conservation (NYSDEC) has reviewed Lockheed Martin Corporation's (LMC) August 5, 1996 response to comments on the Farrell Road Plant Outfall 003 Interim Remedial Measure Work Plan dated July 1996. The LMC response adequately addresses the State's comments and this letter will be incorporated into the work plan. The work plan is hereby approved. The NYSDEC awaits the submittal of the contractors work plan in accordance with the approved schedule. A copy of this final work plan should be placed in the site document repository by LMC.

If you have any questions relative to this matter, please contact me directly at (518) 457-4343.

Sincerely,

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: A. Carlson - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henriette Hamel - NYSDOH
Virginia Robbins, Esq. - Bond, Schoeneck & King, LLP

Attachment 18

Letter from LMC to NYSDEC dated August 8, 1996

Lockheed Martin
Ocean, Radar & Sensor Systems
Post Office Box 4840 Syracuse, NY 13221-4840

LOCKHEED MARTIN

Transmitted via Telecopy

August 8, 1996

Robert W. Schick, P.E.
Section Chief, Remedial Section A
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Re: Soil Remediation Adjacent to Outfall 003: IRM Work Plan
GE Farrell Road Plant, Town of Geddes, Onondaga County, New York
NYSDEC Site #734055

Dear Mr. Schick:

In accordance with our telephone conversation on August 7, 1996, Lockheed Martin Corporation (LMC) will modify the scope of work for the Outfall 003 IRM Work Plan as follows:

"The corrugated metal outfall pipe will be cleaned by a high pressure, low volume water blaster. All water generated during this activity will be collected and containerized for characterization and off-site disposal."

LMC will continue to proceed with the IRM, based on the modified schedule provided in our August 5, 1996 letter. If you have any questions, please contact me at 315-456-3199.

Sincerely,

Patrick Salvador

Patrick D. Salvador, P.E.
Principal Engineer

cc: Director, Bureau of Environmental Exposure Investigation - NYSDOH
Sandra Lee Fenske, Esq. - Lockheed Martin
Henriette Hamel - NYSDOH
Michael J. Lesser, Esq. - NYSDEC
Daniel Palm - NYSDEC
Virginia C. Robbins, Esq.- Bond, Schoeneck & King, LLP