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FOCUSED FEASIBILITY STUDY
PLANT 3 DRYWELLS 20-08 AND 34-07

NORTHROP GRUMMAN CORPORATION
Bethpage Plant 3 Facility
Bethpage, New York

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Prepared for:

NORTHROP GRUMMAN CORPORATION
Bethpage, New York

Prepared by:

REMEDIAL ENGINEERING, P.C.
1377 Motor Parkway, Suite 403
Islandia, New York 11749

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1.0 INTRODUCTION

On behalf of Northrop Grumman Corporation (NGC), Remedial Engineering, P.C. (Remedial Engineering) has completed a Focused Feasibility Study (FFS) for the remediation of polychlorinated biphenyl (PCB)-impacted soils associated with Drywells 20-08 and 34-07 at the NGC facility located in Bethpage, New York (Site). This FFS was conducted in accordance with the Work Plan titled *Plant 3 Drywells 20-08 and 34-07 Soil Remediation Engineering Services Final Work Plan* (Roux Associates, 1999a) prepared by Roux Associates and the Site Characterization Program (SCP) that was approved by the New York State Department of Environmental Conservation (NYSDEC).

This FFS was conducted in accordance with the procedures for the evaluation of remedial alternatives described by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), and the United States Environmental Protection Agency (USEPA) guidance document entitled *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988).

1.1 Description of Area of Concern

Previously, Drywells 20-08 and 34-07 functioned as a component of the Site's stormwater drainage system. The drywells functioned as catch basins, with some stormwater infiltration capability, and were also interconnected to other catch basins, which ultimately discharged into the Navy recharge basins within the Site. Consequently, contamination of the material within each drywell and beyond the horizontal and vertical limits of each former drywell may have resulted from PCB-containing material released during ongoing Site maintenance activities.

The material below and around the Plant 3 Drywells 20-08 and 34-07 has been identified to contain PCBs, and has partially been remediated under the Nassau County Department of Health (NCDOH) Underground Injection Control (UIC) program. Closure of these drywells is required in accordance with the USEPA UIC program currently administrated by the NCDOH. Future remediation activities, however, will be governed by the NYSDEC Division of Environmental Remediation since Drywells 20-08 and 34-07 have been accepted into the Navy's Installation Restoration Program, which is regulated by the NYSDEC.

1.2 Purpose and Organization of Report

The purpose of this FFS is to develop, screen and select feasible remedial alternatives that will address PCB-impacted soils at Drywells 20-08 and 34-07. The FFS objectives for Drywells 20-08 and 34-07 include:

- identification and evaluation of potential remedial technologies for the remediation of soils associated with Drywells 20-08 and 34-07 with PCB concentrations above NYSDEC Recommended Soil Cleanup Objectives (RSCOs);
- assemble feasible technologies into remedial alternatives for initial screening; and
- perform a detailed analysis and comparison of feasible remedial alternatives.

To identify potential remedial technologies, data generated from previous investigations were used to delineate the horizontal and vertical extent of PCB contamination, as well as determine the appropriate remedial action objectives (RAOs) for the Site. In conjunction with the results of the previous investigations, the results of Roux Associates' *Plant 3 Drywells 20-08 and 34-07 Exposure Assessment* (EA) (Roux Associates, 2000c) and the identification of Applicable or Relevant and Appropriate Requirements (ARARs) are utilized to determine the RAOs. General response actions, measures that can be taken to achieve the RAOs such as no action, treatment, and removal, are then established.

Once general response actions are established, the first objective, identification and evaluation of feasible technologies, is performed. Technologies are identified and evaluated as they apply to the general response actions and their feasibility at the Site. The initial screening is performed using three criteria to determine whether further consideration of a specific technology is justified. These three criteria include effectiveness, implementability and cost. If a technology does not meet the criteria, the technology will be determined to be infeasible and will not be further evaluated.

The second objective of the FFS is to assemble feasible technologies into alternatives that address the media and contaminant of concern. Each feasible alternative is evaluated in detail based upon eight criteria identified in the NCP. The eight criteria as set forth in 40 CFR Section 300.430 (e) (9) (iii) are the following:

- compliance with ARARs/State Criteria Guidelines (SCGs);
- overall protection of human health and the environment;
- short-term effectiveness;
- long-term effectiveness and permanence;
- reduction of toxicity, mobility, or volume through treatment;
- implementability;
- cost; and
- community acceptance.

Each alternative is analyzed with respect to each criterion.

Finally, a comparative analysis of each alternative is performed and presented so that a remedy for the Site can be selected. This entails evaluating and comparing the remedial alternatives to provide the basis for the selection of a preferred remedial alternative or alternatives.

2.0 BACKGROUND INFORMATION

This section provides a description of the Site, as well as a summary of previous investigations performed at the Site. A summary of the Site Characterization (SC) investigations and the EA is presented in Section 3.0.

2.1 Site Description and History

The former NGC Plant 3 facility is located in an industrial/commercial area on South Oyster Bay Road in Bethpage, New York (Figure 1). Plant 3 was formerly a government owned, contractor operated (GOCO) facility that NGC elected to return to the United States Navy. Plant 3 is part of the 105-acre Naval Weapons Industrial Reserve GOCO property in Bethpage, New York. A Site plan is included as Figure 2. The facility was transferred back to the Navy in the fall of 1998 after extensive environmental remediation and building restoration activities were performed. The Site is currently owned and maintained by the Navy. Nassau County has developed a Reuse Plan for the property which includes the redevelopment of the facility for industrial/commercial land use. Although NGC has undertaken the remedial activities that result from the investigation and conceptual design process of which this report is a part [described in the Characterization Work Plan (CWP)], the Navy has agreed to perform the design, operation and monitoring of the remedial action, if required in the vicinity of the Plant 3 Drywells 20-08 and 34-07 (Figure 2).

2.2 Previous Investigations

Previously, NGC conducted a Phase I and Phase II Environmental Site Assessment (ESA) of the Plant 3 facility, in which the results identified that the material within Drywells 20-08 and 34-07 required remediation. In June 1998, the material in and below Drywells 20-08 and 34-07 was excavated to depths practicable using a conventional shoring system. However, upon the completion of these excavations, the USEPA requested that NGC perform an additional investigation to further delineate PCBs in adjacent soil above NYSDEC RSCOs and to characterize ground-water quality in the vicinity of each drywell at the Site.

As requested by the USEPA, NGC performed this additional investigation for soil and ground-water quality. This additional investigation was performed as part of the NYSDEC-approved CWP, and was undertaken to define the horizontal and vertical extent of PCB concentrations in

soil that exceed the NYSDEC RSCOs and to characterize ground-water quality in the vicinity of each drywell. In accordance with the CWP, soil borings SB-1 through SB-4 and monitoring wells MW-1 through MW-4 were sampled (Figure 2). The results of this sampling event indicated:

- there was a significant decrease in the concentration of PCBs in soil with depth and distance away from the drywell areas; and

- the PCBs in soil have not significantly impacted ground water.

Despite the decrease in PCB concentrations, the analytical data also indicated that these concentrations in soil exceeded the NYSDEC RSCOs. Therefore, subsequent sampling events, performed as part of the SC investigations, were undertaken to further define the horizontal and vertical extent of PCB concentrations in soil that exceed the NYSDEC RSCOs. In accordance with the Roux Associates, Inc. (Roux Associates) *Supplemental Characterization Work Plan* (Roux Associates, 1999b) and the *Status Summary Letter Report* (Roux Associates, 2000a), soil borings SB-5 through SB-17 were sampled and analyzed. The results of this sampling event indicated that the horizontal and vertical extent of PCB concentrations in soil that exceed the NYSDEC RSCOs had been delineated.

3.0 SUMMARY OF SITE CHARACTERIZATION

This section summarizes the nature and extent of PCB contamination as determined during the Site Characterization Plan (SCP) investigations. The SCP investigations were performed during three sampling events including the SC investigation performed in accordance with the CWP and the Supplemental Site Characterization investigations, performed in accordance with the *Supplemental Characterization Work Plan and Status Summary* letter report. Additionally, an EA was performed. The results of the investigation and the EA were presented in detail in the documents *Plant 3 Drywell 20-08 and 34-07 Site Characterization Report* and *Plant 3 Drywell 20-08 and 34-07 Exposure Assessment.*

3.1 Nature and Extent of Contamination

A summary of the nature and extent of PCB contamination in soils associated with Drywells 20-08 and 34-07, as delineated by information obtained during the SCP, is provided in the following sections.

3.1.1 Drywell 20-08

A total of eight soil borings (SB-1, SB-2, SB-5, SB-6, SB-7, SB-8, SB-13, and SB-14) were sampled near Drywell 20-08. The extent of PCBs detected above NYSDEC RSCOs covers an area of approximately 1,125 square feet. Within this area, the vertical extent of PCB contamination above NYSDEC RSCOs extends from approximately 2 feet below land surface (bls) to a depth of approximately 54 feet bls. The following table summarizes the PCB concentrations in soil and approximate respective volumes, within selected depth intervals from grade to the vertical limits of contamination.

Interval (ft bls)	**Range of Concentrations Detected** (parts per million)	**Total Volume of Soil Within Interval** (cubic yards)	**Volume of Soil Within Interval above NYSDEC RSCOs** (cubic yards)
0 to 2 feet bls	Non-detect to 0.064 ppm	85	0
2 to 14 feet bls	Non-detect to 19 ppm	500	20
14 to 40 feet bls	Non-detect to 45,000 ppm	1,085	265
40 to 54 feet bls	Non-detect to 1,300 ppm	585	450

Figure 3 shows the locations of soil borings installed in the vicinity of Drywell 20-08 and Figures 4 and 5 show cross sections of PCB concentrations in soils associated with Drywell 20-08. Appendix A includes tables summarizing the PCB data for Site soils.

3.1.2 Drywell 34-07

A total of nine soil borings (SB-3, SB-4, SB-9, SB-10, SB-11, SB-12, SB-15, SB-16, and SB-17) were sampled near Drywell 34-07. The extent of PCB-impacted soil detected above NYSDEC RSCOs covers an area of approximately 1,375 square feet. Within this area, the vertical extent of PCB contamination above NYSDEC RSCOs extends from grade to a depth of approximately 56 feet bls. The following table summarizes the PCB concentrations in soil, and approximate respective volumes, within selected depth intervals from grade to the vertical limits of contamination.

Interval (ft bls)	**Range of Concentrations Detected** (parts per million)	**Total Volume of Soil Within Interval** (cubic yards)	**Volume of Soil Within Interval above NYSDEC RSCOs** (cubic yards)
0 to 2 feet bls	1.5 to 3.5 ppm	105	0
2 to 14 feet bls	Non-detect to 110 ppm	615	35
14 to 40 feet bls	Non-detect to 25,000 ppm	1,325	450
40 to 56 feet bls	Non-detect to 1,100 ppm	815	140

Figure 6 shows the locations of soil borings installed in the vicinity of Drywell 34-07 and Figures 7 and 8 show cross sections of PCB concentrations in soils associated with Drywell 34-07. Appendix A includes tables summarizing the PCB data for Site soils.

3.2 Exposure Assessment

The EA was prepared based on guidelines provided by the USEPA document *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A) Interim Final.* The purpose of the EA was to evaluate and quantify the potential impact to human health due to the residual PCB contamination remaining in the drywell areas.

3.2.1 Scope of the Exposure Assessment

The scope of the EA was to assess the potential threat to human health and the environment from the detected PCBs. The scope of work for this assessment included:

- identification of chemicals of potential concern, including a statistical evaluation to summarize the analytical data at the Site and a comparison of the concentrations of chemicals of concern against the NYSDEC RSCOs and the USEPA Region III Risk Based Concentrations (RBCs);

- an evaluation of exposure pathways to identify potential receptors and exposure scenarios; and

- risk calculation.

The highest concentrations of PCBs were detected at depths generally in excess of 14 feet at both drywell locations. Presently, the PCB-impacted soils associated with Drywells 20-08 and 34-07 are covered with 2 feet of soils which are not impacted as well as gravel and/or concrete, thus limiting human contact with the soil.

The maximum concentration of total PCBs at a given soil interval was compared to the respective NYSDEC RSCOs. If the maximum concentration of total PCBs detected in a given depth interval did not exceed the NYSDEC RSCOs, the data were not evaluated any further. If the maximum concentration of total PCBs detected exceeded the NYSDEC RSCOs, then the data were compared to the USEPA Region III RBCs.

3.2.2 Findings and Conclusions of the Exposure Assessment

Although PCBs were detected in soils associated with the former drywell locations, the screening process demonstrated that none of the total PCB concentrations detected within the surface soil (0 to 2 feet) and upper horizon soil (0 to 14 feet) at Drywell 20-08 exceeded the NYSDEC RSCOs or the USEPA industrial RBCs for surface and subsurface soils. At both the intermediate zone (14 to 40 feet) and deep horizon (40 to 68 feet), the maximum concentration of PCBs detected exceeded NYSDEC RSCOs. The maximum PCB concentrations at Drywell 34-07 exceeded both the NYSDEC RSCOs and USEPA RBCs at each interval.

Based on the statistical evaluation and comparison of concentrations to the NYSDEC RSCOs and the USEPA RBCs, total PCBs were identified as chemicals of potential concern at certain

depth intervals at both drywell locations. Since there was no exceedance of the screening criteria in the surface soils and upper horizon soil at Drywell 20-08, an exposure evaluation was not performed for this location at those depths.

Exposure scenarios were considered for potential exposure to impacted soils. The majority of soil containing measurable PCBs is greater than 14 feet bls and located centrally within the NGC property. Based on depth and locality of much of the PCBs, neither the current or future occupants of the Site nor the surrounding community will come into direct contact with these deeper soils. A potential pathway exists for exposure to the surface soils and upper horizon soil at Drywell 34-07 and risk to human health from exposure to these soils was evaluated.

The resultant risk calculations did not identify any excessive risk associated from exposure to soils. The results indicate that there is not likely to be excessive risk associated with exposure to total PCBs measured within these soils and considered under the defined maximum exposure scenarios. Overall, the extent of PCBs present at the Site poses no potential risk to persons using the Site for commercial or industrial activities.

4.0 IDENTIFICATION OF ARARS AND DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

As part of the development of the FS, ARARs must be considered in developing RAOs. Site-specific ARARs are presented in Section 4.1. RAOs for the Site are developed in Section 4.2, based on the results of the SCP and the ARARs. General response actions to meet the RAOs are outlined in Section 4.3.

4.1 Applicable or Relevant and Appropriate Requirements

Applicable requirements are defined as:

> *those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations, promulgated under federal or state environmental facility listing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site.* (40 CFR Section 300.5 at 55 Fed. Reg. 8814, USEPA, 1990.)

Relevant and appropriate requirements are defined as:

> *those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal, or state environmental or facility listing laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.* (40 CFR Section 300.5 at 55 Fed. Reg. 8817, USEPA, 1990.)

Under the Superfund Amendments and Reauthorization Act (SARA), remedial actions must comply with ARARs unless one or more of six conditions are met (CERCLA section 121 [d] [4] [A] - [F]).

1. Interim Measures - The remedial action selected is only part of a total remedial action that will attain such level of standard or control when completed.

2. Greater Risk to Health and the Environment - Compliance with such requirement at the facility will result in greater risk to human health and the environment than alternative options.

3. Technical Impracticability - Compliance with such requirement is technically impractical.

4. Equivalent Standard of Performance - The remedial action selected will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, criteria, or limitation, through use of another method of approach.

5. Inconsistent Application of State Requirements - With respect to a state standard, requirement, criteria, or limitation, the State has not consistently applied the standard, requirement, criteria, or limitation in similar circumstances at other remedial actions.

6. Fund Balancing - Applies to remedial actions to be undertaken solely under Section 104 using the Fund.

The NYSDEC Division of Hazardous Waste Remediation uses New York State SCGs as ARARs in its evaluation and selection of remedial actions (TAGM: Selection of Remedial Actions at Inactive Hazardous Waste Sites - May 15, 1990).

In addition to ARARs, to-be-considered material (TBCs) are to be evaluated as part of the FS process. TBCs are non-promulgated advisories or guidance issued by federal or state government that are not legally binding and do not have the status of ARARs. TBCs are applied as part of the evaluation, if ARARs are not available.

The three different types of ARARs are defined below.

1. Ambient- or chemical-specific ARARs are health- or risk-based numerical values or methodologies. Chemical-specific ARARs establish the amount or concentration of a chemical that may be found in, or discharged to, the environment.

2. Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes.

3. Location-specific ARARs set restrictions on activities based on the characteristics of special locations.

Each of these three types of ARARs and any associated TBCs relevant to this Site are discussed in the following sections.

4.1.1 Chemical-Specific ARARs/SCGs and TBCs

As discussed in Section 3.1, the soil quality results of the completed investigations for the Site indicate that PCBs were detected in soils associated with Drywells 20-08 and 34-07 above their NYSDEC RSCOs. Based on these findings, the following potential chemical-specific ARARs/SCGs and TBCs have been identified for soils associated with Drywells 20-08 and 34-07.

NYSDEC TAGM 4046: Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-94-1994), January 24, 1994 - Provides RSCOs based on protection to human health and the environment.

USEPA Soil Screening Guidance: User's Guide, April 1996 - Provides risk-based concentrations derived from standardized equations combining exposure assumptions for residential land use with USEPA toxicity data.

USEPA Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (Subpart S). Proposed Rule July 27, 1990 (55FR 30819) - Provides action levels based on residential exposures for long-term direct contact and soil ingestion.

Lists of Hazardous Wastes (6 NYCRR Part 371.4) - Provides regulatory action levels for solid wastes containing PCBs to determine whether the soil is a listed hazardous waste. 6 NYCRR Part 371.4 states that solid wastes containing greater than 50 parts per million (ppm) of PCBs by weight are listed hazardous wastes. Several samples indicated PCB concentrations above 50 ppm, making those soils a listed hazardous waste.

Appendix A of TAGM 4046 states that the NYSDEC RSCO for PCBs is 1.0 ppm for surface soils and 10 ppm for subsurface soils. Several samples indicated PCB concentrations which exceed the NYSDEC RSCO.

4.1.2 Action-Specific ARARs/SCGs and TBCs

Action-specific ARARs/SCGs and TBCs have been identified based on possible remedial alternatives. The four alternatives to address the PCBs in soils associated with Drywells 20-08 and 34-07, as described in Section 6.0, include no action, dispersive chemical reaction (DCR), in-situ thermal desorption and excavation and off-site disposal.

4.1.3 Location-Specific ARARs/SCGs and TBCs

No location-specific ARARs/SCGs have been identified based upon the Site's location, its physical characteristics and proximity to wildlife habitats.

4.2 Development of Remedial Action Objectives

RAOs are medium-specific goals for protecting human health and the environment. RAOs were developed based on the investigation's results used in combination with the ARARs/SCGs and TBCs. For PCB-impacted soils associated with Drywells 20-02 and 34-07, the RAO is to control, remove or remediate the source of PCBs in the media.

4.3 General Response Actions

General response actions consist of measures which can be undertaken to achieve the RAOs. The following general response actions have been identified.

No Action - The no action response measure provides a baseline assessment for comparison with other response measures consisting of greater levels of response. When a response measure may

cause a greater environmental or health danger than a no action response, the no action response measure may be considered as an appropriate remedial measure for a site. The no action response is evaluated and carried through the FFS as required by 40 CFR Part 300.430[e][iii]. The no action response may consist of no action whatsoever on the Site, or some limited measure, such as periodic monitoring or access restrictions to the Site or specific area of the Site.

Institutional Controls - Institutional controls restrict access to impacted media by means other than physical barriers or removal. For example, deed restrictions may be used to limit future use of the property to activities that do not cause exposure to contaminants.

Containment - Containment is a general type of source control measure in which the chemical constituents of concern exceeding specified NYSDEC RSCOs are isolated from the remaining area of the Site. Containment measures provide isolation of the impacted media, thereby minimizing the potential for direct exposure to, or migration of, chemical constituents of concern.

Containment technologies usually consist of impermeable or low permeability caps, which may be constructed as a surface feature. Containment can also include hydraulic containment or vertical or horizontal barriers at depth.

Stabilization - Stabilization is a general type of source control measure in which the contaminant's ability to migrate or leach is minimized. Stabilization technologies can be in-situ or ex-situ and include vitrification and DCR.

In-Situ Treatment - In-situ response actions involve the treatment of impacted media without disturbing the media (i.e., treatment in place) using physical, chemical or biological methods. Feasible in-situ methods for soils include SVE, chemical stabilization and thermal desorption. As with other types of treatment technologies, the objective of in-situ treatment is to attain the specified NYSDEC RSCOs.

Ex-Situ Treatment - Ex-situ response actions involve the removal of impacted media and treatment using physical or chemical methods. The treated media is then used as backfill. Feasible ex-situ methods for soils include solvent extraction and soil washing.

Removal, Treatment and Disposal Actions - Removal response actions consist of the removal of media containing chemical constituents of concern from their existing place via excavation, or other extraction techniques. Removal of impacted media requires appropriate on- or off-site treatment in accordance with applicable regulations. For removal of PCB-impacted soils associated with Drywells 20-08 and 34-07, Site conditions must be restored by replacement with clean fill and restoration of vegetation or pavement.

Treatment technologies for the PCB-impacted soils may consist of physical, thermal, chemical or biological methods. For the soils associated with Drywells 20-08 and 34-07, soil washing and DCR are two of the most feasible ex-situ soil treatment methods that can be used. Impacted media are treated to levels which attain the defined NYSDEC RSCOs for the chemical constituents of concern. Any off-site treatment options allow for potential exposure to affected media of workers and the surrounding community during transport and handling activities.

Disposal actions include placement of the PCB-impacted soils in an on- or off-site containment area. This generally includes a properly constructed landfill which is permitted to accept soils containing the PCB concentrations present in soils associated with Drywells 20-08 and 34-07.

Removal and Disposal Actions - These response actions consist of removal as described above, and subsequent disposal. Disposal consists of off-site disposal in an appropriately designed and permitted facility. Off-site disposal requires proper analyses to classify the material as hazardous or non-hazardous, and transport to the appropriate properly permitted facility. On-site disposal requires the construction of a landfill in accordance with state and federal requirements.

5.0 DEVELOPMENT OF TECHNOLOGIES

This section identifies, evaluates and screens potential remedial technologies which may be employed to address PCB-impacted soils associated with Drywells 20-08 and 34-07 and to achieve the RAOs described in Section 4.2. The remedial technologies to be evaluated in this section were initially identified in Roux Associates' *Plant 3 Drywells 20-08 and 34-07 Soil Remediation Engineering Services Final Workplan* dated October 1999 and have been chosen based on their potential for treatment of PCB-impacted soils.

The objective of screening the technologies is to narrow the field of available options, eliminating those which cannot be implemented, or those associated with a high cost but not a substantial increase in performance in relation to other options. After screening, the remaining remedial technologies will be combined as necessary into a variety of remedial alternatives which will undergo a more detailed evaluation in Section 6.0.

The technologies in this section have been identified through a review of relevant literature, experience with similar types of environmental problems, engineering judgment and discussions with vendors and contractors. All of the options will be evaluated on the basis of:

- effectiveness;
- implementability; and
- cost.

The criteria for effectiveness considers whether the technology can decrease or contain the concentrations of PCBs in soils to meet the RAOs. Potential impacts to human health and the environment, and whether the technology has proven reliable for the conditions at the Site are also considered.

The criteria for implementability focuses on institutional aspects of remedial technologies with factors such as institutional constraints, time schedules, and the availability of services, equipment and trained personnel being considered as part of the evaluation.

The criteria for cost addresses only the relative costs of identified remedial technologies. The purpose of these initial cost estimates is to evaluate whether the costs associated with technologies which provide similar levels of effectiveness and implementability are considered as high, moderate or low relative to one another.

As discussed in Section 4.0, several general response actions with potential applicability to the Site have been identified:

- no action;
- institutional controls;
- containment;
- stabilization;
- in-situ treatment;
- ex-situ treatment;
- removal, treatment and disposal options; and
- source removal and disposal.

These general response actions, the selected remedial technology types initially screened and retained, and specific process options associated with these technology types for soil are outlined in Table 1.

As shown in Table 1, four technologies with potential applicability to the remediation of PCBs in soils associated with Drywells 20-08 and 37-04 have been identified. The technologies are described in detail in the remainder of this section, and include:

1. SVE with hot air injection;
2. DCR;
3. in-situ thermal desorption; and
4. excavation and offsite disposal.

As indicated in Section 3.1, soils associated with Drywells 20-08 and 34-07 contain PCBs at concentrations above the NYSDEC's RSCOs and in select areas, above the concentration

required to classify the soil as a listed hazardous waste. Extensive soil sampling has indicated that approximately 1,360 cubic yards of PCB-impacted soils (concentrations above NYSDEC RSCOs) are present between 2 feet and 54 feet bls. It is estimated that up to 50% of these soils are a listed hazardous waste (contain more than 50 ppm PCBs). It is being assumed, for the purposes of developing a cost estimate for this FFS that the entire volume of PCB-impacted soils (from 2 to 54 feet bls) will be remediated.

5.1 Soil Vapor Extraction with Hot Air Injection

SVE is an in-situ treatment technology used to remediate volatile organic compounds (VOC) in unsaturated soils. Hot air injection allows stripping of less volatile compounds (semivolatile organic compounds [SVOC]). Injection and extraction wells would be installed in the area of the impacted soils. A vacuum is applied to the extraction wells creating a pressure/concentration gradient which causes the contaminants to volatilize. Hot air is injected into the soils to increase air flow and the additional heat allows stripping of less volatile compounds. The induced air flow draws contaminated vapors and entrained water to a vapor/liquid separator. Contaminated vapors are then treated (e.g. with a carbon adsorption unit) in accordance with applicable air permitting requirements. Contaminated process water can either be treated and discharged on-site or disposed off-site.

5.1.1 Effectiveness

PCBs are among the most stable compounds known and are not readily broken down by physical or chemical means. SVE with hot air injection can be used to treat soils which contain oils associated with PCBs, however, the Site soils contain dry-phase PCBs. As PCBs are not volatile, SVE with hot air injection is generally not cost effective and is an inefficient technology to treat soils containing PCBs which are not associated with an oil.

5.1.2 Implementability

SVE is a common, readily available treatment technology and is considered highly implementable for remediation of soils impacted with volatile compounds.

5.1.3 Cost

Typical costs for treatment of soils using SVE would be low to moderate in cost compared to other treatment technologies.

5.1.4 Conclusions

SVE is typically used to treat soils impacted with VOCs and SVOCs and not PCBs. Since SVE is not cost effective or efficient for the treatment of the primary component in the PCB-impacted soils, it will not be retained for further evaluation.

5.2 Dispersive Chemical Reaction

DCR is an ex-situ stabilization technology in which quicklime with retarders (hydrophobic agents) are added to the impacted soils to reduce their mobility. Contaminants are immobilized and the hydraulic conductivity of the soil is lowered, reducing the leachability of the contaminant. The impacted soils would be excavated and loaded into a mobile treatment unit to be stabilized. The treatment unit would generally consist of a control panel, mixer, lime-feed apparatus, water container and conveyor assembly. The stabilized soils would be used to backfill the excavation.

5.2.1 Effectiveness

DCR has generally been used to stabilize heavy metals and oils and is effective in minimizing the rate of mobility and leachability of contaminants. However, the PCBs in soils associated with Drywells 20-08 and 34-07 are not impacted by a significant amount of oil and therefore, are already generally immobile. The actual concentration of the PCBs would remain unchanged, and would thus continue to be above the NYSDEC RSCOs. Therefore, stabilization is not effective for the reduction of PCB concentrations. As DCR would require excavation of the PCB-impacted soils, there is a potential for human and/or environmental exposure. Other potential health and safety concerns include hazards associated with deep excavations and exposure to materials used in the DCR process. As the PCBs are not associated with a large amount of oil, DCR is not considered an effective treatment technology for the PCB-impacted soils.

5.2.2 Implementability

DCR treatment of the impacted soils in DCR treatment unit could be completed in approximately two weeks. However, the excavation of the impacted soils to load into the treatment unit would take approximately two months and excavation to 54 feet bls presents implementation issues that include sheeting/shoring and potentially dewatering. As PCBs above NYSDEC RSCOs would remain in place, a deed restriction would be required after use of this technology. As DCR is not a widely used treatment technology, there are a limited number of vendors available to supply the required treatment unit. DCR is not considered a readily implementable remedial alternative for the PCB-impacted soils.

5.2.3 Cost

The cost associated with DCR is lower in comparison to excavation and disposal and in-situ thermal desorption.

5.2.4 Conclusions

DCR is generally used to reduce the mobility of PCBs immersed in oil and is not as effective for dry-phase PCBs. As PCBs are already generally immobile in Site soils, the cost of DCR does not warrant the relatively small reduction in PCB mobility. Therefore, DCR will not be retained for further evaluation.

5.3 In-Situ Thermal Desorption

In-situ thermal desorption heats the contaminated soil to a target temperature set according to the boiling point of PCBs. A network of vacuum suction wells with heating elements is installed throughout the area of PCB-impacted soils with typical spacings of approximately 7 to 10 feet. The soil is heated to approximately 800° to 1,000° Celsius and the PCBs are destroyed. The resulting vapors are collected through the vacuum suction wells and are destroyed in a thermal oxidizer or adsorbed by an activated carbon unit. Computer models are used to estimate the length of time required to reduce the PCB concentrations to the appropriate concentrations. Post-treatment samples can be collected to verify treatment.

5.3.1 Effectiveness

Previous studies and projects have shown that in-situ thermal desorption is effective in destroying nearly 100% of PCBs in soils. Exposure to contaminated vapors would be a potential health and safety issue, however, proper operation and maintenance of the thermal oxidizer and activated carbon units should prevent exposure. Hazards associated with drill rigs required for well installation and collection of post-treatment samples would be another potential health and safety concern.

5.3.2 Implementability

Treatment using in-situ thermal desorption could be completed within a 3-month timeframe. This would include well installation, equipment mobilization and treatment. Currently, there is only one known vendor which commercially provides treatment using in-situ thermal desorption. Moreover, the vendor has indicated that the equipment will not be available until February 2002. Although careful coordination with the vendor is required to secure the equipment, in-situ thermal desorption can be implemented at this site if work can be initiated in 2002.

5.3.3 Cost

The cost associated with in-situ thermal desorption is expected to be higher than DCR but less than excavation and disposal. However, concerns about commercial availability are significant.

5.3.4 Conclusions

In-situ thermal desorption is effective in destroying PCBs in soils and is more cost effective than excavation and disposal. In-situ thermal desorption will be retained for further evaluation.

5.4 Excavation and Off-Site Treatment and Disposal

The PCB-impacted soils associated with Drywells 20-08 and 30-04 would be excavated to the depths (approximately 56 feet bls) and areal extent previously described in Section 3.1 and as presented in Figure 9 and 10, respectively. Excavation would be performed with the use of mechanical excavation equipment. Sheeting/shoring would be required to maintain the width of the excavation and protect construction personnel and equipment from collapse of the excavation walls. Excavated soils would be transported to a properly permitted off-site disposal facility. Based on previous sampling and for the purposes of the cost estimate, 50% of the excavated soils

are estimated to be impacted with PCBs. Approximately 50% of the impacted soils have been classified as non-hazardous and 50% have been classified as hazardous. The remaining 50% of the soils are assumed not to be impacted and can be used as on-site backfill. Landfill and/or treatment facility permit requirements would mandate any required testing.

5.4.1 Effectiveness

Excavation and off-site disposal is a proven and reliable method to remove all contaminated media. The use of this technology would not reduce the volume or toxicity of the PCB-impacted soils, but would prevent dermal contact and ingestion exposure pathways through physical removal. Contaminant exposure risk to workers is possible during excavation, however, with proper engineering and health and safety controls, this risk is minimized. During transportation activities, risk of exposure would exist to humans and the environment; however, contingency measures such as covering of transport vehicles and use of leak-proof vehicles would minimize this exposure. Other potential health and safety issues include the hazards associated with deep excavation such as potential collapse of excavation walls and heavy equipment traffic.

5.4.2 Implementability

The amount of time needed for excavation and off-site disposal of PCB-impacted soils associated with Drywells 20-08 and 34-07 is expected to be approximately two months. Excavation activities would require extensive sheeting/shoring and potentially dewatering. This technology is feasible since experienced contractors, transportation, equipment, treatment facilities and landfill capacity are readily available for implementation of this option.

5.4.3 Cost

The cost associated with excavation and off-site disposal is expected to be higher than DCR and in-situ thermal desorption. The main reasons for the higher costs are required sheeting/shoring for a deep excavation and disposal of PCB-impacted soils as hazardous waste.

5.4.4 Conclusions

Excavation and off-site disposal is an effective and implementable technology for the removal of PCB-impacted soils. Costs are high in comparison to the other technologies, but this technology

offers complete remediation of the area. Therefore, excavation and off-site disposal will be retained for further evaluation.

5.5 Applicable Technologies

It must be noted that several other technologies such as vitrification, solvent extraction and soil washing were screened as part of this evaluation. These technologies were eliminated from further evaluation without a formal description for several reasons including cost and reliability. Further, none of these technologies offered a distinct advantage over the four technologies chosen for additional evaluation. Table 1 provides a summary of all the technologies which were initially screened.

The following technologies have been determined to be applicable to address PCB-impacted soils associated with Drywells 20-08 and 34-07 and have been retained for further evaluation in Section 6.0:

- in-situ thermal desorption; and
- excavation and off site disposal.

6.0 DEVELOPMENT AND EVALUATION OF ALTERNATIVES

Section 5.0 identified technologies that can be used to reduce the potential risks posed by the PCB-impacted soils associated with Drywells 20-08 and 34-07. This section further evaluates the technologies deemed viable in Section 5.0 in addition to a no action alternative. The alternatives to be evaluated in this section include:

- Alternative I No Action
- Alternative II In-Situ Thermal Desorption
- Alternative III Excavation and Off-Site Disposal

Development and evaluation of relevant information has been performed to select a remedy for the PCB-impacted soils associated with Drywells 20-08 and 34-07. In accordance with the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, and the Inactive Hazardous Waste Disposal Site Remedial Program, each alternative was assessed against the following eight criteria:

1. Compliance with ARARs/SCGs - describes how the alternative complies with identified chemical-specific, action-specific and location-specific ARARs. The assessment includes information from advisories, criteria and guidance that agencies have agreed is necessary and appropriate.

2. Overall Protection of Human Health and the Environment - describes how the alternative, as a whole, protects and maintains protection of human health and the environment.

3. Short-Term Effectiveness - examines the effectiveness of the alternative in protecting the community, workers and the environment during the specified construction and implementation period until response objectives have been met.

4. Long-Term Effectiveness and Permanence - evaluates the effectiveness of the alternative in protecting human health and the environment after response objectives

have been met and are measured in terms of the magnitude of residual risk and the adequacy and reliability of any controls that are used.

5. Reduction of Toxicity, Mobility, or Volume Through Treatment - evaluates the anticipated performance of the specific alternative in terms of treatment process used and materials treated; amount of hazardous materials destroyed or treated; degree of expected reductions in toxicity, mobility and volume; degree to which treatment is irreversible; and the type and quantity of residuals remaining after treatment.

6. Implementability - evaluates the feasibility of the alternative in terms of the ability to construct and operate the technology; reliability of the technology; ease of undertaking additional remedial actions, if necessary; ability to monitor effectiveness of remedy; availability of off-site disposal services and availability of prospective technologies.

7. Cost - evaluates the capital, operation and maintenance, and present worth costs of the alternative.

8. Community Acceptance - preliminarily assesses the community's apparent preferences or concerns about the alternative.

The results of this assessment were used to comparatively evaluate the alternatives in Section 7.0 and determine which of the alternatives is most appropriate for implementation.

6.1 Alternative I – No Action

The No Action alternative is evaluated as a procedural requirement to provide a baseline for comparison of the cost effectiveness of action alternatives. Evaluation of this alternative identifies the potential risks associated with PCB-impacted soils in the areas of Drywells 20-08 and 34-07.

No samples indicated PCBs above the NYSDEC RSCOs in surface soils (0 to 2 feet bls). Therefore, exposure of site employees or temporary workers to PCB-impacted soils via incidental ingestion, dermal absorption or inhalation of dust particles is unlikely. The existing 2-foot layer of soils would remain in place. The existing asphalt at Drywell 20-08 would be

repaired and asphalt would be installed at Drywell 34-07. Both of the asphalt areas would be monitored regularly to confirm that the cap is in good condition. If the No Action alternative is implemented, a deed restriction will need to be placed in the areas of impact near Drywells 20-08 and 34-07. Construction workers could potentially be exposed to PCB-impacted soils during intrusive activities such as installation of footings and foundations. Based on ground-water sampling results and the fact that PCBs are generally immobile in the environment, environmental impact resulting from leaching of PCBs is not likely. While PCB concentrations would remain above NYSDEC RSCOs, protection of the environment would be maintained provided no intrusive activities were performed.

6.1.1 Compliance with ARARs/SCGs

The No Action alternative would not comply with the chemical-specific ARARs/SCGs or TBCs. There are no action-specific ARARs/SCGs for this alternative because no action would be taken. There are no location-specific ARARs/SCGs.

6.1.2 Overall Protection of Human Health and the Environment

As future site use is commercial/industrial and surface soils are not impacted, human exposure to PCB-impacted soils is unlikely. If any invasive activities were performed in the area of Drywells 20-08 and 34-07 (e.g., excavation for foundations or footings below 2 feet bls), construction personnel could be exposed to PCB-impacted soils. However, this exposure can be minimized with proper controls. No long term effects to the environment are expected based on leaching characteristics of PCBs, the general immobility of PCBs in the environment and ground-water results. The No Action alternative is considered protective of human health and the environment.

6.1.3 Short Term Effectiveness

Since there are minimal actions proposed for this alternative (i.e., asphalt restoration), there are no associated short-term effects to human health and the environment. Based on the EA conclusions and the lack of a short-term treatment (e.g. excavation) exposure scenario, this alternative would provide short-term protection.

6.1.4 Long Term Effectiveness and Permanence

The No Action alternative will not provide a long-term or permanent remedy. The evaluation criteria for long term effectiveness and permanence are based on the amount of residual risk of contamination left on the Site after the alternative has been implemented. If the No Action alternative is implemented, the current level of risk associated with PCB-impacted soils in the areas of Drywells 20-08 and 34-07 will remain, however, based on the EA, excessive risk associated with these soils is highly unlikely.

6.1.5 Reduction of Toxicity, Mobility or Volume Through Treatment

This alternative would not have an effect on the toxicity, mobility or volume of the contaminated media on-site since no action will be taken. However, PCBs are generally considered immobile in the environment so mobility is not a consideration. PCBs do not readily degrade so concentrations will remain above NYSDEC RSCOs in the areas around Drywells 20-08 and 34-07.

6.1.6 Implementability

There are no implementation issues other than the installation and restoration of open asphalt.

6.1.7 Cost

The cost for Alternative I includes initial asphalt installation, annual visual site inspections, necessary annual concrete/asphalt repairs and certification to NYSDEC that the protective cap is in good condition. It is estimated that the capital cost for Alternative I is $2,400 and annual cost for Alternative I is $1,300 per year. Table 2 provides a breakdown of costs associated with this alternative.

6.1.8 Community Acceptance

Based on the results of the EA, it is anticipated that the community may accept this alternative as the PCB-impacted soils do not pose excessive risk to human health or the environment.

6.2 Alternative II – In-Situ Thermal Desorption

Alternative II includes installation of a network of wells with typical spacings of approximately 7 to 10 feet. Approximately 45 wells will be required for Drywell 20-08 and approximately 55 wells will be required for Drywell 34-07. Heating elements will be installed in each of the wells.

The soil will heated to the boiling point of PCBs, thus destroying PCBs in the soils. Monitoring systems and thermocouple probes in the soil are used to monitor the progress of the thermal front through the soil.

Most contaminated vapors will be destroyed in the extremely hot soil near the heat source, however, remaining contaminated vapors are drawn out of the soils through the vacuum suction wells and remediated in a trailer-mounted vapor treatment system. The vapor treatment system includes a flameless thermal oxidizer and activated carbon filters. Resulting emissions will include only carbon dioxide and water vapor.

A control trailer will be installed at the Site which will control the power and heat in the wells and the vapor treatment system. Computer models are used to estimate the length of time required to reduce the PCB concentrations to the appropriate concentrations. Post-treatment samples will be collected to verify treatment.

6.2.1 Compliance with ARARs/SCGs

Alternative II would satisfy chemical ARARs/SCGs as PCBs would be destroyed and the concentrations reduced below the NYSDEC RSCOs. Alternative II would satisfy action-specific ARARs/SCGs and there are no location-specific ARARs/SCGs.

6.2.2 Overall Protection of Human Health and the Environment

Alternative II would provide overall protection of human health and the environment as PCB concentrations would be reduced below the NYSDEC RSCOs. Well installation, high temperatures, electricity and air emissions could pose potential health hazards to Site personnel. Air emissions could also pose an environmental hazard. However, compliance with OSHA regulations, engineering controls and proper air monitoring and permitting can minimize these risks.

6.2.3 Short Term Effectiveness

Alternative II is anticipated to take approximately three months to complete. As Alternative II is an in-situ technology, potential exposure due to inhalation, ingestion or dermal contact with PCB-impacted soils is unlikely. Air emissions resulting from the treatment process pose a

potential risk for human and environmental exposure, however, this exposure can be minimized with proper air monitoring and engineering controls such as vacuum suction wells which adequately extract contaminated vapors which are subsequently treated in thermal oxidizers and carbon adsorption units.

6.2.4 Long Term Effectiveness and Permanence

Alternative II provides long term effectiveness and permanence because PCBs are destroyed and concentrations are reduced below the NYSDEC RSCOs. Soil sampling can be performed to confirm that the in-situ thermal desorption process has reduced PCB concentrations below the NYSDEC RSCOs.

6.2.5 Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative II will reduce the volume of PCBs in soils associated with Drywells 20-08 and 34-07. Resulting PCB concentrations would be below the NYSDEC RSCOs, and therefore, toxicity and mobility of PCBs would not be a concern.

6.2.6 Implementability

Currently, there is only one known vendor which commercially provides treatment using in-situ thermal desorption. However, the vendor has indicated that the equipment will be available as of February 2002. This technology could be implemented, however availability of the vendor and equipment could be a concern.

6.2.7 Cost

The total cost for Alternative II is estimated as approximately $1,440,900. Table 3 provides a breakdown of costs associated with this alternative.

6.2.8 Community Acceptance

Community acceptance of Alternative II is likely, because use of in-situ thermal desorption will reduce PCB concentrations in soils below the NYSDEC RSCOs.

6.3 Alternative III - Excavation and Off-Site Disposal

Alternative III includes mechanical excavation of PCB-impacted soils associated with Drywells 20-08 and 34-07. Following excavation, the PCB-impacted soils will be transported off-site and disposed at a hazardous waste facility. Alternative III consists of the following components, which are discussed in further detail in this section:

- asphalt removal and disposal;
- sheeting and shoring;
- excavation of PCB-impacted soils;
- transportation and off-site disposal;
- excavation backfill; and
- restoration.

Asphalt Removal and Disposal

Approximately 50 cubic yards of asphalt exist in the areas of Drywell 20-08 and 34-07. This asphalt must be removed to allow access for excavation of the underlying PCB-impacted soils. The asphalt will be saw cut at the limits of the excavation, broken down into smaller pieces using heavy equipment, removed with an excavator and stockpiled, prior to off-site disposal. Potentially impacted soils adhering to the asphalt will be brushed off. The asphalt will be transported to a properly permitted recycling facility where it will be crushed and re-used. It is estimated that the duration of asphalt removal and disposal activities will be approximately two days.

Sheeting and Shoring

Sheeting and shoring materials will be installed around the perimeter of the excavations for Drywells 20-08 and 34-07 which will be proximate to existing buildings. Sheeting and shoring is necessary to prevent failure of the excavation walls, prevent diminishment of the width of the excavation, burying equipment, cross-contamination of soils and health and safety risks to construction personnel. It is estimated that approximately 16,000 square feet of sheeting and shoring will be required. The sheeting design will be completed by a New York State licensed professional engineer. Sheeting and shoring will likely be removed subsequent to the completion

of excavation activities. The duration of sheeting and shoring installation and removal is estimated to be approximately twelve days.

Excavation of PCB-Impacted Soils

PCB-impacted soils associated with Drywells 20-08 and 34-07 will be excavated to the horizontal and vertical extents previously determined through sampling. Approximately 1,500 cubic yards of impacted soils will be excavated and disposed. Excavated soils will either be loaded directly into dump trailers or roll-off containers for transport or stockpiled on plastic sheeting adjacent to the excavation area. Stockpiled soils will be covered with plastic sheeting and surrounded by berms or silt fence to prevent erosion and sedimentation. Water will be available on-site to minimize dust generation. Orange safety fence will be installed around the excavation at the end of each work day to prevent unauthorized or inadvertent access. The duration of excavation activities is estimated to be approximately four weeks.

Transportation and Off-Site Disposal

Off-site disposal consists of transporting PCB-impacted soils to a properly permitted hazardous waste landfill or treatment facility. Since all excavation work will occur above the ground-water table, it is not expected that solidification agents will be needed to minimize the presence of free liquids. Waste characterization samples will be collected and analyzed in accordance with the disposal facility's requirements. Approximately 2,000 tons of PCB-impacted soils are estimated to be disposed. Approximately 50% of the excavated soils are estimated to be impacted with PCBs. Approximately 50% of the impacted soils are estimated to be non-hazardous and 50% are estimated to be hazardous. The remaining 50% of the soils will be used for backfill. Transport vehicles will travel over a gravel tire-cleaning pad or site soils will be brushed/washed from vehicle tires prior to leaving the site. It is estimated that approximately 200 to 220 dump trailers will be required to transport the PCB-impacted soils. The duration for transportation and off-site disposal will be approximately two weeks.

Excavation Backfill

Subsequent to excavation and disposal activities, the excavation will be backfilled with excavated non-PCB-impacted soils and clean fill. Backfill will be placed in 12-inch lifts and compacted to attain 95% of the Standard Proctor. It is estimated that approximately 3,800 cubic

yards of excavated non-PCB-impacted soils will be available for backfill. Approximately 2,800 cubic yards of additional clean fill will be required to backfill the excavation. It is estimated that the duration for excavation backfill is approximately one week.

Restoration

The disturbed areas of the site will be restored with vegetation or asphalt, dependent upon anticipated future site use.

6.3.1 Compliance with ARARs/SCGs

Alternative III would satisfy chemical ARARs/SCGs as soils with PCB concentrations above the NYSDEC RSCOs would be removed. Alternative III would satisfy action-specific ARARs/SCGs and there are no location-specific ARARs/SCGs.

6.3.2 Overall Protection of Human Health and the Environment

Alternative III would provide overall protection of human health and the environment as soils containing PCB concentrations above the NYSDEC RSCOs would be removed from the site. Hazards associated with deep excavations and potential exposure to PCB-impacted soils through dust or dermal contact could pose potential risks to Site personnel. However, compliance with OSHA regulations, engineering controls and proper air monitoring can minimize these risks.

6.3.3 Short Term Effectiveness

Alternative III is anticipated to take approximately two months to complete. During this time, disturbance of the PCB-impacted soils could potentially pose a risk for exposure due to inhalation, ingestion or dermal contact with PCB-impacted soils. However, this exposure can be prevented with proper air monitoring and engineering controls such as applying water to site soils to prevent dust generation. Risk of off-site human and environmental exposure could potentially exist during off-site transportation activities. However, contingency measures such as covering and lining of the vehicles and the use of leak-proof vehicles will minimize any potential exposure.

6.3.4 Long Term Effectiveness and Permanence

Since off-site disposal does not treat the PCB-impacted soils, Alternative III does not achieve long term effectiveness or permanence with respect to treatment. However, Alternative III provides long term effectiveness and permanence for the Site because soils containing PCB concentrations above the NYSDEC RSCOs will be removed. Removal of PCB-impacted soils from the Site will eliminate exposure risks to site personnel and potential environmental impact.

6.3.5 Reduction of Toxicity, Mobility or Volume Through Treatment

If the PCB-impacted soils are transported to a thermal treatment facility to be incinerated, the toxicity and volume will be reduced. If the PCB-impacted soils are disposed at a hazardous waste facility with no prior treatment, the toxicity and volume will not be reduced. The mobility of the PCB-impacted soils will be significantly reduced as they will be placed in a secured, properly permitted landfill.

6.3.6 Implementability

The services of contractors to perform the excavation work, as well as landfill facilities needed to dispose of the PCB-impacted soils, are readily available. Therefore, this alternative is considered implementable. However, deep excavation and the associated sheeting/shoring present challenging engineering and construction issues.

6.3.7 Cost

The total cost for Alternative IV is estimated as $2,187,960. Table 4 provides a breakdown of costs associated with this alternative.

6.3.8 Community Acceptance

The community generally accepts off-site disposal as a remedial option since it removes the contaminated soils from their surrounding area, however, remedial options that destroy the contaminants are generally preferred by the community. Truck traffic through the area will not be looked upon favorably by the residents of the local communities, however, since the Site is located in an industrial/commercial area, traffic resulting from remediation activities at the site will cause a minimal increase in overall truck traffic.

7.0 COMPARISON OF ALTERNATIVES

After individually evaluating the feasible alternatives in Section 6.0, this section comparatively evaluates the most viable alternatives. SVE and DCR were eliminated in Section 5.0. The remaining alternatives to be compared in this section include:

- Alternative I - No Action;
- Alternative II - In-Situ Thermal Desorption; and
- Alternative III - Excavation and Off-Site Disposal.

This comparative analysis is conducted with respect to the eight evaluation criteria described in Section 6.1. The advantages and disadvantages of each alternative will be evaluated so the most appropriate remedial alternative can be selected.

The two criteria, Compliance with ARARs/SCGs and Overall Protection of Human Health and the Environment, will generally serve as threshold determinations as they must be met by any alternative in order for it to be eligible for selection as the preferred alternative.

The remaining six criteria, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility or Volume Through Treatment, Implementability, Cost and Community Acceptance will be discussed to further evaluate the strengths and weaknesses of each alternative.

7.1 Compliance with ARARs/SCGs

This threshold criterion determines whether an alternative satisfies chemical-specific ARARs/SCGs, location-specific ARARs/SCGs, action-specific ARARs/SCGs and other criterion, advisories and guidance. There are no location-specific ARARs to be addressed for this Site.

Alternative I will not comply with chemical-specific or action-specific ARARs/SCGs since no action would be taken and the PCB-impacted soils would remain at the Site above the NYSDEC RSCOs. However, Alternative I potentially falls under the conditions for exception to the

ARARs/SCGs as discussed in Section 4.1. Removal of the PCB-impacted soils may cause a greater risk to human health and the environment than No Action and No Action may attain a standard of performance equivalent to certain other remedial actions.

Alternatives II and III will comply with chemical-specific and action-specific ARARs/SCGs. Alternative II (in-situ thermal desorption) would reduce PCB concentrations below the NYSDEC RSCOs and Alternative III (excavation and off-site disposal) would remove the PCB-impacted soils from the Site.

Alternatives II and III both comply with the ARARs/SCGs for the Site. Alternative I does not comply with the ARARs/SCGs.

7.2 Overall Protection of Human Health and the Environment

This threshold criterion determines whether an alternative protects against potential human health and environmental risks associated with the PCB-impacted soils.

Alternative I will provide overall protection of the environment because PCBs are generally immobile in the environment so it is highly unlikely that they will migrate into Site ground water. Alternative I is protective of human health because the soils containing PCB concentrations above the NYSDEC RSCOs exist more than two feet below the ground surface, therefore human exposure during commercial or industrial activities is highly unlikely.

Alternative II will provide overall protection of human health and the environment because PCB concentrations in Site soils will be reduced below the NYSDEC RSCOs.

Although Alternative III will potentially pose short-term exposure risks while excavating and transporting PCB-impacted soils, Alternative III will provide overall protection of human health and the environment because PCB-impacted soils will be removed from the site.

All three alternatives provide protection of human health and the environment based on the conclusions of the EA which indicated that excessive risk associated with the PCB-impacted soils is highly unlikely.

7.3 Short Term Effectiveness

Alternative I does not pose any short-term effects during its implementation period since no action will be taken, and there is no associated implementation period.

During implementation of Alternative II, the potential for exposure to air emissions exists. However, this exposure can be prevented with proper air monitoring and engineering controls.

During implementation of Alternative III, the potential for dust generation in the work areas exists, as well as risks associated with off-site transportation (spills from vehicles). However, proper air monitoring and engineering controls in the work areas and contingency measures implemented during transportation will minimize short term effects to humans and the environment.

Alternative I provides the most short-term effectiveness because there are no short-term risks such as construction-related health and safety issues, construction personnel exposure or accidental release to the environment during transportation. Alternative II poses some short-term risks related to well drilling and potential release of vapors to the environment. Alternative III provides the least short-term effectiveness of the three alternatives because there are several short-term risks associated with excavation and disposal including hazards associated with deep excavations, potential construction personnel exposure and accidental release to the environment during transportation.

7.4 Long Term Effectiveness

Long-term effectiveness and permanence examines the effectiveness of all alternatives in protecting human health and the environment after response objectives have been met, and are measured in terms of the magnitude of residual risk at the Site.

Alternative I provides long term effectiveness as PCB-impacted soils are not located at the surface and are generally immobile in the environment. However, Alternative I does not provide permanence as the PCB-impacted soils would remain on Site above the NYSDEC RSCOs.

Alternative II provides long term effectiveness and permanence because PCB concentrations in Site soils will be reduced below NYSDEC RSCOs.

Alternative III provides long term effectiveness and permanence because PCB-impacted soils will be removed from the site.

Alternative II provides the most long-term effectiveness because most of the PCBs in the Site soils will be destroyed. Alternative III provides long-term effectiveness because the PCB-impacted soils will be placed in a properly constructed and permitted landfill where migration of the PCBs is minimized and access is controlled. Alternative I does not provide as much long-term effectiveness because the PCB-impacted soils will remain in-place.

7.5 Reduction of Toxicity, Mobility or Volume Through Treatment

This criterion evaluates the anticipated performance of a specific alternative in terms of the treatment process used and materials tested, the amount of hazardous materials destroyed or treated, the degree of expected reductions in toxicity, mobility and volume, the degree to which treatment is irreversible and the type and quantity of residuals remaining after treatment.

Alternative I will not reduce the toxicity or volume of the PCB-impacted soils as no action will be implemented. PCBs are generally immobile in the environment, therefore mobility is not a consideration.

The toxicity and volume of PCB-impacted soils would be reduced with Alternative II as in-situ thermal desorption would reduce PCBs below NYSDEC RSCOs. PCBs are generally immobile in the environment, therefore mobility is not a consideration.

Although mobility of the PCB-impacted soils is not a consideration, potential mobility would be further reduced with Alternative III because the soils would be transported to a secure, properly permitted landfill. The toxicity and volume would be reduced if the soils were thermally treated prior to landfill disposal.

Alternative II will provide the most reduction of toxicity, mobility and volume in the environment because most of the PCBs will be destroyed. Alternative III will reduce the mobility of the PCB-impacted soils but not the toxicity or the volume. Alternative I will not reduce the toxicity, mobility or volume of the PCB-impacted soils, however, PCBs are generally immobile in the environment and exposure to the PCB-impacted soils is unlikely based on their depth.

7.6 Implementability

Implementability evaluates the feasibility of an alternative based on the ability to construct and operate the technology, reliability of the technology, ease of undertaking additional remedial actions, if necessary; ability to monitor effectiveness of the remedy, and availability of services and equipment.

There are minimal implementation issues for Alternative I because no remedial action would be taken other than asphalt installation/restoration.

Alternative II is an implementable remedial option, however the commercial availability of in-situ thermal desorption is limited. Although, only known one vendor currently provides in-situ thermal desorption, the technology can be constructed and is reliable for the destruction of PCBs.

Alternative III is considered to be highly implementable since contractors and disposal facilities are available to perform the work and receive the PCB-impacted soils.

Alternative I is the most implementable remedial option which only requires annual monitoring and maintenance of the existing asphalt. Alternative III is implementable because qualified contractors and landfills are readily available. Alternative II is the most difficult remedial option to implement because the commercial availability of the technology is limited.

7.7 Cost

Cost is used to evaluate the capital and operation and maintenance costs associated with an alternative.

The capital cost for Alternative I is $2,400 with $1,300 for annual maintenance costs.

The capital cost for Alternative II is $1,440,900.

The capital cost for Alternative III is $2,187,960.

Alternative I is the most cost effective remedial option for the site because the annual costs for monitoring and maintenance of the asphalt are minimal and Alternative I still provides protection of human health and the environment. Alternative II and III are both associated with significant cost impacts.

7.8 Community Acceptance

It is anticipated that Alternative I will not be as acceptable to the community since soils will remain on-site with PCB concentrations above the NYSDEC RSCOs.

Alternatives II and III are anticipated to be accepted by the community since PCB concentrations in the soils will be reduced below the NYSDEC RSCOs or the PCB-impacted soils will be remained from the Site. Alternative II may be preferable to the community because it will not cause heavy truck traffic in the area and the PCBs will be destroyed rather than transported to a landfill.

Alternative II is anticipated to be the most widely accepted remedial option by the community because most of the PCBs in Site soils will be destroyed. Alternative III is not anticipated to be as widely accepted because the PCBs will not be destroyed and transport of the PCB-impacted soils will create truck traffic in local communities. Alternative I is not anticipated to be as widely accepted by the community because PCB-impacted soils will remain in place.

8.0 CONCLUSIONS

Evaluation of the three alternatives against the eight criteria discussed in Section 7.0 indicates that Alternative I – No Action would be the recommended remedial action. This recommendation is based on the following:

- PCBs are generally immobile in the environment so migration is unlikely;
- at least two feet of clean soils exist on top of soils with PCB concentrations above the NYSDEC RSCOs;
- existing asphalt will be restored at Drywell 20-08 and new asphalt will be installed at Drywell 34-07;
- soils containing the highest PCB concentrations are present in deep soils, at least 14 feet bls;
- potential exposure scenarios associated with excavation and transport of the PCB-impacted soils would be avoided;
- future Site use will be industrial or commercial and the property would be deed restricted;
- conservative risk calculations performed in the EA indicate that there is no potential risk to persons using the Site for commercial or industrial activities;
- there is no cost associated with this alternative while the other alternatives are associated with significant cost impacts; and
- PCB-impacted soils have already been excavated to approximately 28 feet bls and disposed as part of previous remedial efforts in the vicinity of Drywells 20-08 and 34-07.

In the event that a No Action alternative is unacceptable, the evaluation indicates that Alternative II – In-Situ Thermal Desorption would be a satisfactory remedial alternative for the PCB-impacted soils associated with Drywells 20-08 and 34-07. This is based on the following:

- Alternative II would meet all ARARs/SCGs for the site because most of the PCBs in the soil would be destroyed, reducing PCB concentrations below NYSDEC RSCOs;

- overall human health and the environment would be protected because PCB concentrations would be reduced below the NYSDEC RSCOs;

- Alternative II would be preferred by the NYSDEC and the community because this remedy is permanent and PCB concentrations would be reduced below NYSDEC RSCOs;

- the cost impact of Alternative II is less than Alternative III – Excavation and Off-Site Disposal which is largely due to hazardous disposal costs and the costs for sheeting and shoring required for excavation and disposal; and

- the local community would experience less disturbances such as dust, noise and truck traffic with Alternative II than Alternative III.

Respectfully submitted,
ROUX ASSOCIATES, INC

Omar Ramotar, P.E.
Project Engineer

ROUX ASSOCIATES, INC

Peter J. Gerbasi, P.E.
Principal Engineer

REFERENCES

Roux Associates, Inc., 1999a. Plant 3 Dry Wells 20-08 and 34-07 Soil Remediation Engineering Services Final Work Plan, Northrop Grumman Corporation, Bethpage Plant 3 Facility, October 11, 1999.

Roux Associates, Inc., 1999b. Plant 3 Drywells 20-08 and 34-07 Soil Investigation Supplemental Field Characterization Final Work Plan (Supplemental Characterization Work Plan, Roux Associates, Inc., 1999.

Roux Associates, Inc., 2000a. Status Letter Report Summarizing Ongoing Investigations and Proposed Scope of Work for the Delineation of PCB Contamination (Status Summary Letter Report, Roux Associates, Inc., March 2000).

Roux Associates, Inc., 2000b. Plant 3 Drywells 20-08 and 34-07 Site Characterization Report, Northrop Grumman Corporation, Bethpage Plant 3 Facility, September 15, 2000.

Roux Associates, Inc., 2000c. Plant 3 Dry Wells 20-08 and 34-07 Exposure Assessment, Northrop Grumman Corporation, Bethpage Plant 3 Facility, September 15, 2000.

United States Environmental Protection Agency, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, October 1988.

Table 1. Summary of Technologies Evaluated to Address PCB-Impacted Soils. Northrop Grumman Corporation; Bethpage, New York.

General Response Actions	Remedial Technology	Process Options	Description	Evaluation Comments
No Action	---	---	No action	Required to be carried through detailed analysis of alternatives.
Institutional Controls	Deed Restriction	---	Deed restriction would be placed on the property to prevent future residential use of the site.	Would be implemented in conjunction with another remedial technology, such as capping in which contaminants would remain in-place.
Containment	Cap	Soil	Low permeability soil placed over area containing PCB-impacted soils	Not effective because direct contact/wind blown dust/erosion are not a threat. Impacted soils are greater than 2 feet BGS.
		Single Barrier	Low permeability soil with additional clean fill and topsoil placed over area containing PCB-impacted soils.	Not effective because direct contact/wind blown dust/erosion are not a threat. Impacted soils are greater than 2 feet BGS.
		Double Barrier	Clay covered with a geomembrane, clean fill and topsoil.	Not effective because direct contact/wind blown dust/erosion are not a threat. Impacted soils are greater than 2 feet BGS.
	Barrier Wall	Sheet Piling	Steel sheeting driven into the subgrade around the area of PCB-impacted soils to prevent migration and reduce ground-water flow through impacted soils.	Costs do not justify the benefits as PCB-impacted soils will remain on-site.
		Bentonite Barrier	Trench is excavated around the area of PCB-impacted soils and backfilled with bentonite to prevent migration and reduce ground-water flow through impacted soils.	Costs do not justify the benefit as PCB-impacted soils will remain on-site. Not practicable because trench would need to be excavated to 54 feet BGS.
Stabilization	Solidification	In-Situ Vitrification	Electrical power is used to melt soils and destroy contaminants, creating a stable glass and crystalline monolith.	It has been estimated that vitrification is only effective to 30 feet BGS. Creation of the large monolith limits future site use options in this area.
		Pozzolan/Cement	Materials such as fly ash, kiln dust, pumice or cement-based materials are injected into the area of PCB-impacted soils using drilling techniques. The hardened cement materials will contain the contaminants.	Solidification of the soils will limit future site use options in this area because the solidified soils cannot be excavated for future development such as foundation installation.

Table 1. Summary of Technologies Evaluated to Address PCB-Impacted Soils. Northrop Grumman Corporation; Bethpage, New York.

General Response Actions	Remedial Technology	Process Options	Description	Evaluation Comments
	Chemical Stabilization	Dispersive Chemical Reaction	PCB-impacted soils are excavated and mixed with quicklime and hydrophobic agents to reduce mobility and leachability of PCBs.	Potentially viable.
In-Situ Physical/Chemical Treatment	Thermal Treatment	SVE with Hot Air Injection	A vacuum is applied to extraction wells creating a pressure /concentration gradient which causes the contaminants to volatilize. Hot air is injection increase air flow and allows stripping of less volatile compounds.	Potentially viable.
		In-Situ Thermal Desorption	Wells equipped with heating elements are installed to heat the soils to temperatures sufficient to destroy (boil) the PCBs.	Potentially viable.
	Chemical Alteration	Chemical Dehalogenation	Contaminated soils are mixed with reagents and heated in a reactor. Dehalogenation is either achieved by replacement of the halogen molecules or decomposition and partial volatilization of the contaminants.	Commercial applications have been limited. Soils require physical separation prior to treatment.
Ex-Situ Physical/Chemical Treatment	Separation	Solvent Extraction	An organic solvent is used to extract the PCBs in an extraction unit and soils are then rinsed to remove entrained solvents.	Soils may require physical separation prior to treatment. Traces of solvents may remain in the soils. A large volume of soils generally requires treatment before solvent extraction becomes cost effective. Residuals still require disposal.
		Soil Washing	Mechanical or chemical methods are used to separate fine PCB-impacted soils particles from generally clean coarse grained soil particles.	Soil washing is not proven to reduce PCB concentrations below the required NYSDEC RSCOs. Separated fine-grained soils still require disposal.
Removal, Treatment and Disposal Actions	Excavation	On-Site Disposal	A properly permitted and constructed landfill installed on-site. PCB-impacted soils excavated using mechanical equipment and disposed in on-site facility.	Cost prohibitive and not consistent with future site use plans. Significant permitting required.
		Off-Site Disposal	PCB-impacted soils are excavated using mechanical equipment and disposed at a properly permitted off-site facility.	Potentially viable.

Table 2. Cost Estimate for No Action Alternative. Northrop Grumman Corporation, Bethpage, New York.

Description	Units of Measure	Quantity	Unit Cost ($)	Total Sub Item Cost ($)	Total Item Cost ($)
Installation of Asphalt at Drywell 34-07	lump sum	1	2,400	2,400	
Annual Monitoring	lump sum	1	450	450	
Annual Asphalt Repairs/Maintenance	lump sum	1	500	500	
Annual Certification to NYSDEC	lump sum	1	350	350	
TOTAL					**3,700**

Table 3. Cost Estimate for In-Situ Thermal Desorption. Northrop Grumman Corporation, Bethpage, New York.

Description	Units of Measure	Quantity	Unit Cost ($)	Total Sub Item Cost ($)	Total Item Cost ($)
Item 1. Site Preparation and Site Restoration					
Bonding and Insurance (5%)	lump sum	1	52,000	52,000	
Design/Premobilization	lump sum	1	49,440	49,440	
Mobilization	lump sum	1	55,040	55,040	
Permitting	lump sum	1	3,000	3,000	
Preparation of submittals and implementation of approved plans	lump sum	1	5,000	5,000	
Health and safety monitoring, supplies and equipment	lump sum	1	5,000	5,000	
Sanitary facilities	lump sum	1	750	750	
Temporary offices	lump sum	1	2,500	2,500	
Signs	lump sum	1	500	500	
Demobilization	lump sum	1	61,880	61,880	
Site Restoration (2.5%)	lump sum	1	26,000	26,000	
Confirmatory Sampling	lump sum	1	7,000	7,000	
Item Subtotal					**261,110**
Item 2. Construction and Operation					
Construction	lump sum	1	371,300	371,300	
Operation	lump sum	1	418,600	418,600	
Item Subtotal					**789,900**
Item 3. Royalty					
Royalty	lump sum	1	57,370	57,370	
Item Subtotal					**57,370**
SUBTOTAL					**1,108,380**
ENGINEERING (10%)					**110,840**
CONSTRUCTION MANAGEMENT (10%)					**110,840**
CONTINGENCY (10%)					**110,840**
TOTAL					**1,440,900**

Notes:

1. In-situ thermal desorption equipment is not available until February 2002.

Table 4. Cost Estimate for Excavation and Off-Site Disposal. Northrop Grumman Corporation; Bethpage, New York.

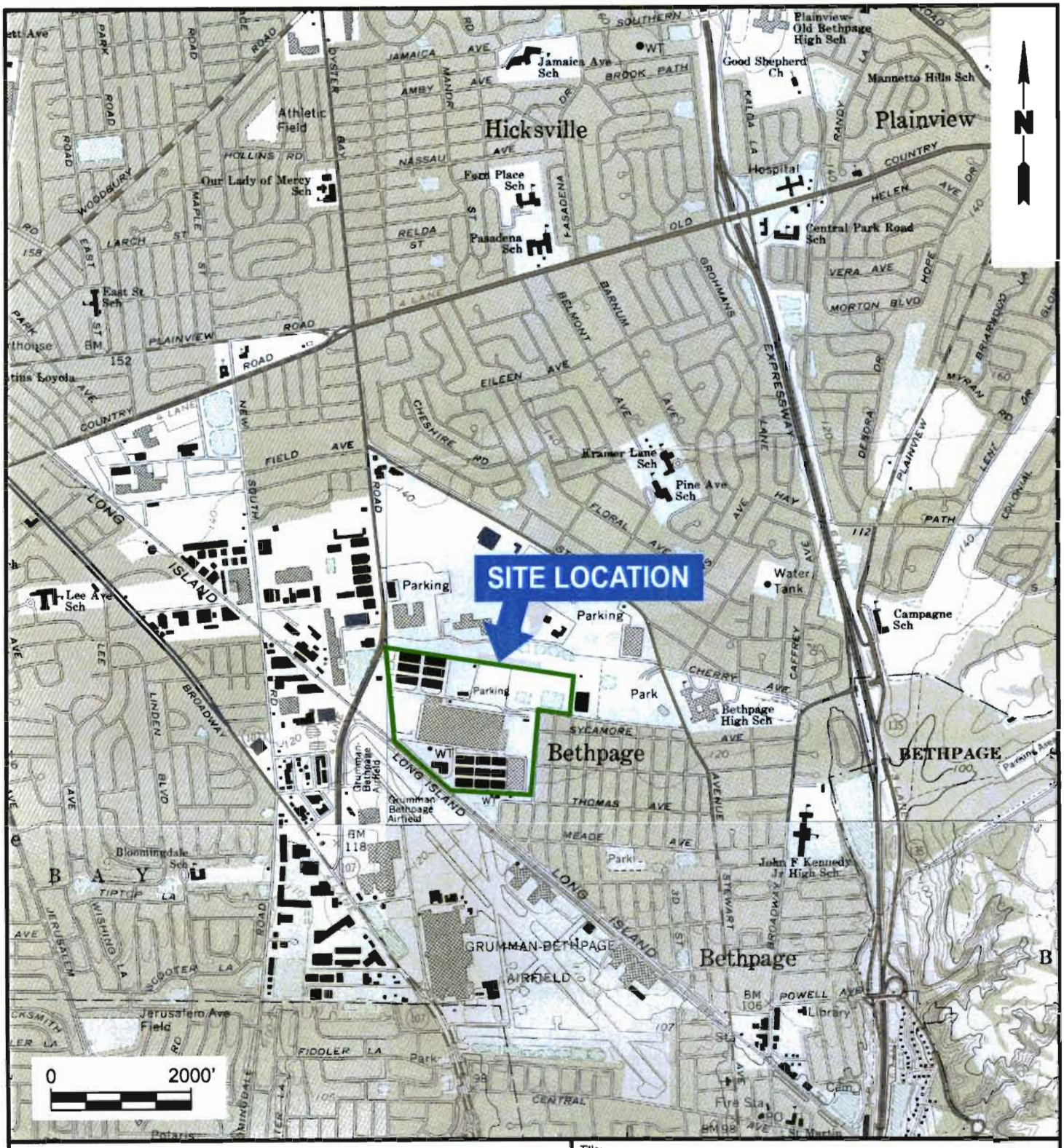
Description	Units of Measure	Quantity	Unit Cost ($)	Total Subitem Cost ($)	Total Item Cost ($)
Item 1. Site Preparation and Site Restoration					
Bonding and Insurance (5%)	lump sum	1	71,640	71,640	
Mobilization (5%)	lump sum	1	71,640	71,640	
Permitting	lump sum	1	3,000	3,000	
Preparation of submittals and implementation of approved plans	lump sum	1	10,000	10,000	
Erosion Control	lump sum	1	640	640	
Health and safety monitoring, supplies and equipment	lump sum	1	5,000	5,000	
Equipment and personnel decontamination	lump sum	1	1,000	1,000	
Sanitary facilities	lump sum	1	750	750	
Temporary offices	lump sum	1	2,500	2,500	
Dust suppression	lump sum	1	2,000	2,000	
Staging areas	lump sum	1	2,500	2,500	
Trash Removal	lump sum	1	1,500	1,500	
Surveying and as-built drawings	lump sum	1	5,000	5,000	
Signs	lump sum	1	500	500	
Temporary fencing	lump sum	1	1,000	1,000	
Demobilization (2.5%)	lump sum	1	35,820	35,820	
Site Restoration (2.5%)	lump sum	1	35,820	35,820	
Item Subtotal					**250,310**
Item 2. Asphalt Saw Cutting					
Drywell 20-08	linear feet	140	5.40	760	
Drywell 34-07	linear feet	148	5.40	800	
Item Subtotal					**1,560**
Item 3. Asphalt Removal					
Drywell 20-08	cubic yard	21.00	10.00	210	
Drywell 34-07	cubic yard	26.00	10.00	260	
Item Subtotal					**470**
Item 4. Waste Excavation and Stockpiling[1]					
Drywell 20-08 (0 to 54 ft bls)	cubic yard	2,250	4.53	10,200	
Drywell 34-07 (0 to 54 ft bls)	cubic yard	2,860	4.53	12,960	
Item Subtotal					**23,160**
Item 5. Sheeting[2]					
Drywell 20-08	square feet	7,560	40.00	302,400	
Drywell 34-07	square feet	8,288	40.00	331,520	
Item Subtotal					**633,920**
Item 6-A. Transportation and Off-Site Disposal of Excavated C&D Debris (i.e., asphalt) and Bulky Waste					
Drywell 20-08	ton	32.00	22	700	
Drywell 34-07	ton	40.00	22	880	
Item Subtotal					**1,580**
Item 6-B. Transportation and Off-Site Disposal of Non-Hazardous Contaminated Waste[1]					
Drywell 20-08	ton	930	65	60,450	
Drywell 34-07	ton	1,180	65	76,700	
Item Subtotal					**137,150**
Item 6-C. Transportation and Off-Site Disposal of Hazardous Waste[1]					
Drywell 20-08	ton	930	250	232,500	
Drywell 34-07	ton	1,180	250	295,000	
Item Subtotal					**527,500**

Table 4. Cost Estimate for Excavation and Off-Site Disposal. Northrop Grumman Corporation; Bethpage, New York.

Description	Units of Measure	Quantity	Unit Cost ($)	Total Subitem Cost ($)	Total Item Cost ($)
Item 7. Waste Charaterization (RCRA metals, pH, ignitablility, reactivity, PCBs 8082, Pest. 8081, Herb. 8151, TCLP VOAs and TCLP Metals)					
Drywell 20-08	samples	9	1,000	9,000	
Drywell 34-07	samples	11	1,000	11,000	
Item Subtotal					**20,000**
Item 8. Backfill and Compaction					
Provision of backfill material - 20-08	ton	1,860	8.95	16,650	
Provision of backfill material - 34-07	ton	2,360	8.95	21,120	
Placement, grading and compaction - 20-08	ton	3,720	5.31	19,760	
Placement, grading and compaction - 34-07	ton	4,720	5.31	25,080	
Item Subtotal					**82,610**
Item 9. Warning Barrier					
Drywell 20-08	square feet	1,125	0.17	190	
Drywell 34-07	square feet	1,375	0.17	230	
Item Subtotal					**420**
Item 10. Asphalt Restoration					
Drywell 20-08	square yard	130	15.00	1,950	
Drywell 34-07	square yard	160	15.00	2,400	
Item Subtotal					**4,350**
SUBTOTAL					**1,683,030**
ENGINEERING (10%)					**168,310**
CONSTRUCTION MANAGEMENT (10%)					**168,310**
CONTINGENCY (10%)					**168,310**
TOTAL					**2,187,960**

Notes:

1. Assumes 50% of excavated material to be disposed off-site (50% as non-hazardous waste and 50% as hazardous waste) and the remaining 50% to be used as on-site backfill.
2. Open excavation area used for sheeting quantities.



QUADRANGLE LOCATION

USGS 1969; Hicksville, New York
7.5 Minute Quadrangle (Topographic)

Title:

SITE LOCATION MAP

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared for: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. Environmental Engineers	Compiled by: S.G.	Date: 08/15/01	FIGURE 1
	Prepared by: B.H.C.	Scale: 1"=2000'	
	Project Mgr.: S.G.	Office: NY	
	File No.: NGC0210206.CDR	Project No.: 70902Y	

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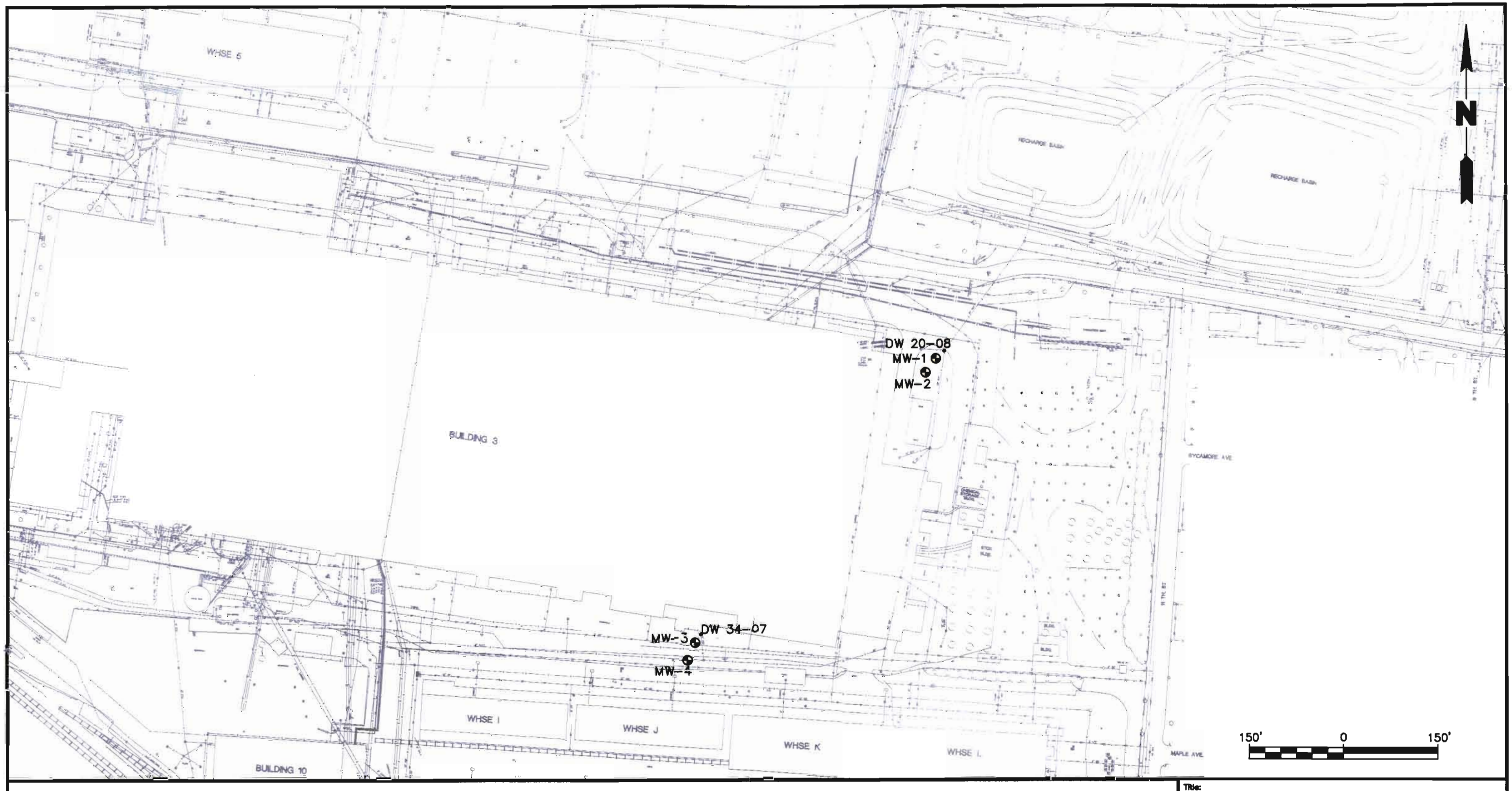

LEGEND

DW 20-08 • APPROXIMATE LOCATION AND DESIGNATION OF NAVAL PROPERTY DRY WELL

MW-1 ⊕ APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL

Title:

SITE PLAN

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared For: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. ENVIRONMENTAL ENGINEERS	Compiled by: N.G.	Date: 06/18/01	FIGURE 2
	Prepared by: G.M./R.K.	Scale: AS SHOWN	
	Project Mgr: B.F.	Office: NY	
	File No: 70902004	Project: 70902Y	

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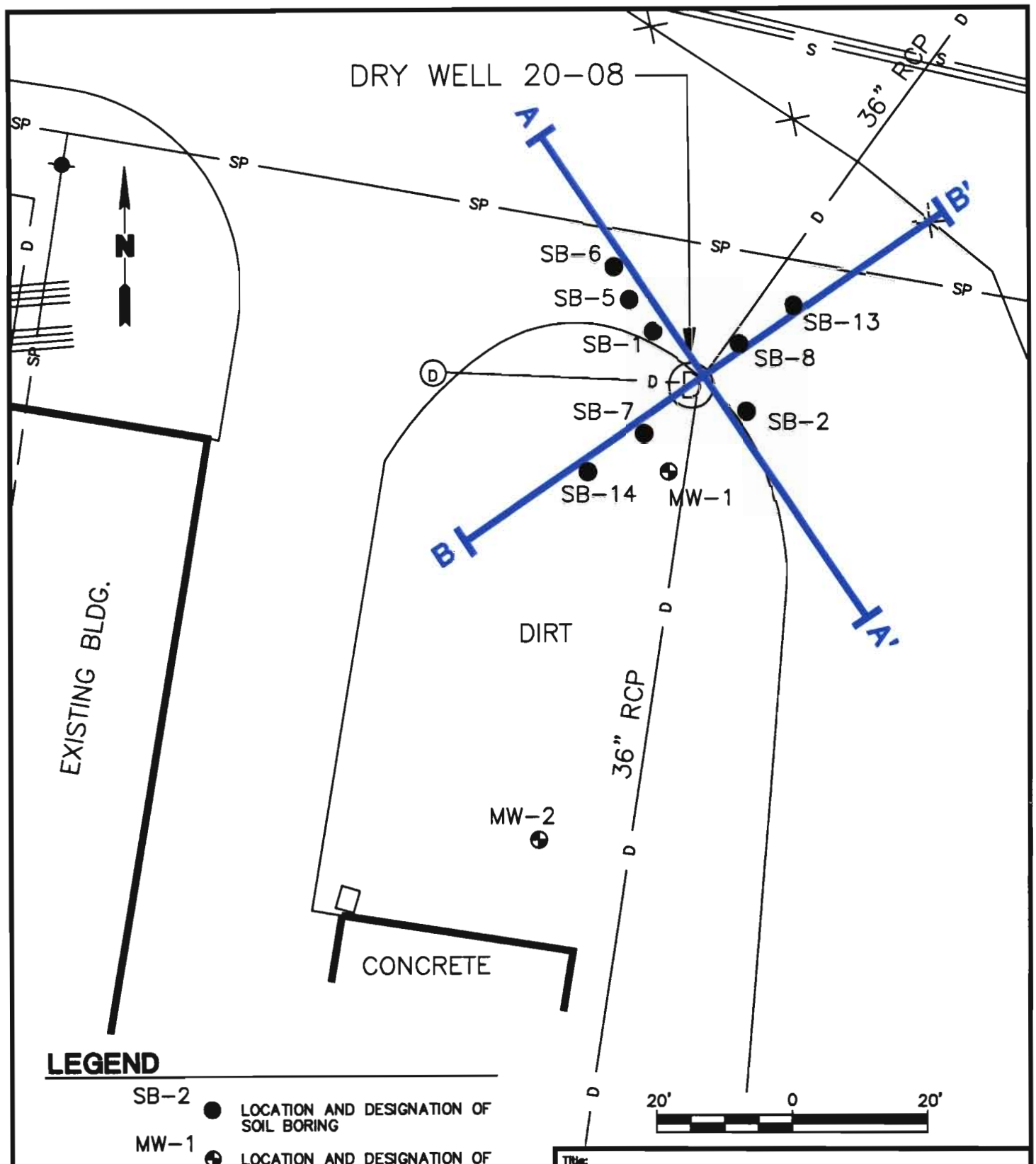

LEGEND

SB-2 ●	LOCATION AND DESIGNATION OF SOIL BORING
MW-1 ⊕	LOCATION AND DESIGNATION OF MONITORING WELL
A — A'	LINE OF CROSS SECTION
— SP —	SEWER PIPE
— D —	DRAIN LINE
×—×	FENCE
(D)	DRY WELL

Title:

DRYWELL 20-08 SOIL BORING LOCATION PLAN

PLANT 3 DRYWELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared For: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. ENVIRONMENTAL ENGINEERS	Compiled by: O.R.	Date: 06/15/01	FIGURE 3
	Prepared by: R.K.	Scale: AS SHOWN	
	Project Mgr: W.F.	Office: NY	
	File No: 70902005	Project: 70902Y	

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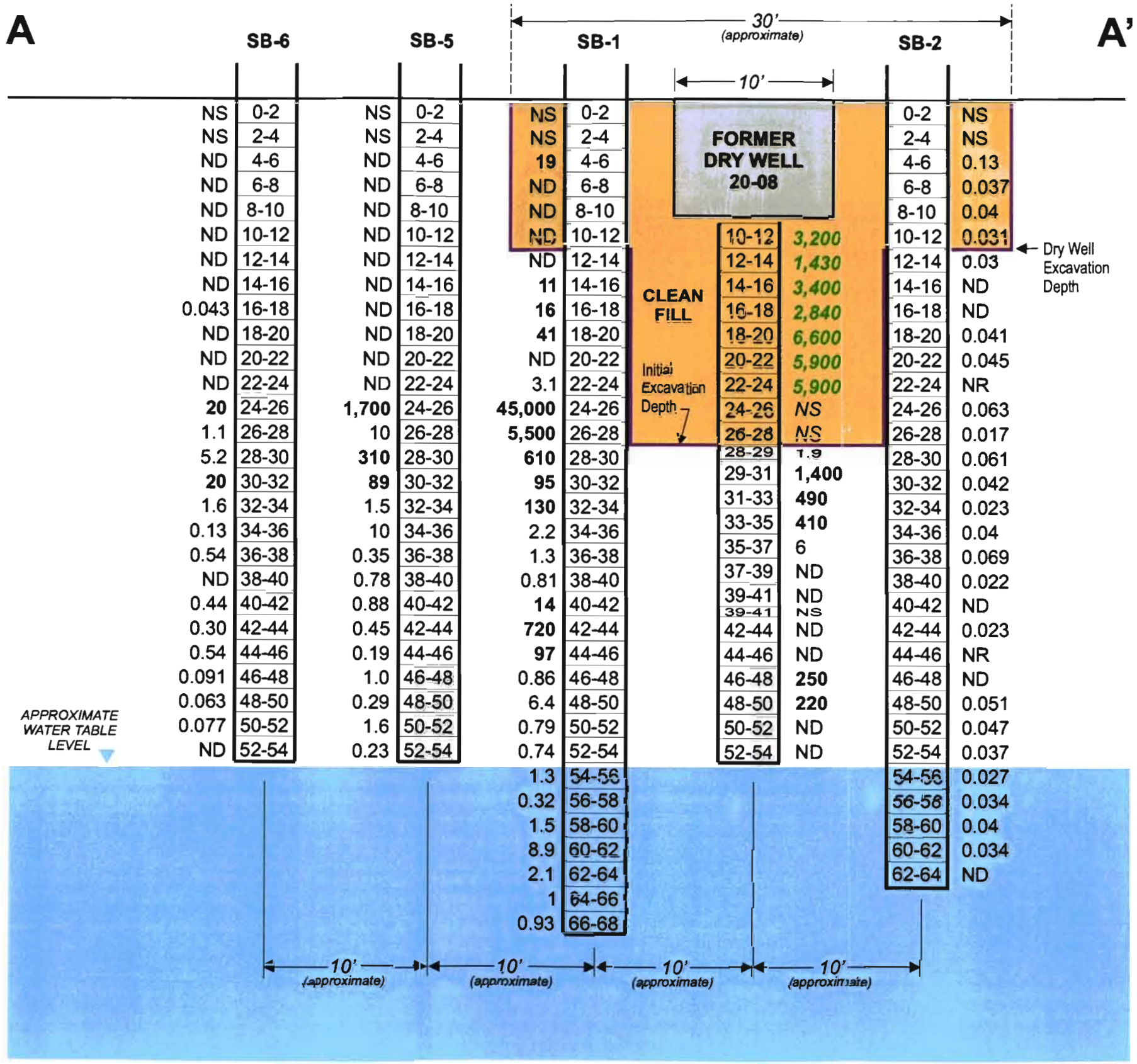

SB-6		SB-5		SB-1			SB-2	
NS	0-2	NS	0-2	NS	0-2		0-2	NS
NS	2-4	NS	2-4	NS	2-4		2-4	NS
ND	4-6	ND	4-6	19	4-6		4-6	0.13
ND	6-8	ND	6-8	ND	6-8		6-8	0.037
ND	8-10	ND	8-10	ND	8-10		8-10	0.04
ND	10-12	ND	10-12	ND	10-12	*3,200*	10-12	0.031
ND	12-14	ND	12-14	ND	12-14	*1,430*	12-14	0.03
ND	14-16	ND	14-16	11	14-16	*3,400*	14-16	ND
0.043	16-18	ND	16-18	16	16-18	*2,840*	16-18	ND
ND	18-20	ND	18-20	41	18-20	*6,600*	18-20	0.041
ND	20-22	ND	20-22	ND	20-22	*5,900*	20-22	0.045
ND	22-24	ND	22-24	3.1	22-24	*5,900*	22-24	NR
20	24-26	**1,700**	24-26	**45,000**	24-26	*NS*	24-26	0.063
1.1	26-28	10	26-28	**5,500**	26-28	*NS*	26-28	0.017
5.2	28-30	**310**	28-30	**610**	28-30	1.9	28-30	0.061
20	30-32	**89**	30-32	**95**	30-32	1,400	30-32	0.042
1.6	32-34	1.5	32-34	**130**	32-34	**490**	32-34	0.023
0.13	34-36	10	34-36	2.2	34-36	**410**	34-36	0.04
0.54	36-38	0.35	36-38	1.3	36-38	6	36-38	0.069
ND	38-40	0.78	38-40	0.81	38-40	ND	38-40	0.022
0.44	40-42	0.88	40-42	**14**	40-42	ND	40-42	ND
0.30	42-44	0.45	42-44	**720**	42-44	NS	42-44	0.023
0.54	44-46	0.19	44-46	**97**	44-46	ND	44-46	NR
0.091	46-48	1.0	46-48	0.86	46-48	ND	46-48	ND
0.063	48-50	0.29	48-50	6.4	48-50	**250**	48-50	0.051
0.077	50-52	1.6	50-52	0.79	50-52	**220**	50-52	0.047
ND	52-54	0.23	52-54	0.74	52-54	ND	52-54	0.037
				1.3	54-56		54-56	0.027
				0.32	56-58		56-58	0.034
				1.5	58-60		58-60	0.04
				8.9	60-62		60-62	0.034
				2.1	62-64		62-64	ND
				1	64-66			
				0.93	66-68			

LEGEND

5.2	PCB concentration below 10 ppm NYSDEC Regulatory Standard[1,2]
20	PCB concentration above 10 ppm NYSDEC Regulatory Standard[1,2]
ND	non detect
NR	no recovery
NS	no sample collected
SB-1	soil boring designation
52-54 0.74	PCB concentration for sample taken above water table at sample depth interval of 52-54 ft below land surface
54-56 1.3	PCB concentration for sample taken below water table at sample depth interval of 54-56 ft below land surface
	polyethylene plastic sheet lining

NOTES:

1. NYSDEC Regulatory Standard based on *Technical and Administrative Guidance Memorandum HWR-94-4046 on the Determination of Soil Cleanup Objectives and Cleanup Levels, as revised January 24, 1994.*
2. PCB concentration represented in green italics reflect concentrations detected from contaminated soil removed and disposed off-site during previous remediation efforts.
3. Soil borings within and through Drywell 20-08 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
DRYWELL		10 to 14-foot	Radian International, Herdon, Virginia
DRYWELL	October 9, 1997	14 to 24-foot	H2M, P.C., Melville, New York
DRYWELL	April 4, 1998	28 to 29-foot	H2M, P.C., Melville, New York
DRYWELL	June 23, 1998 July 30, 1998	29 to 54-foot	H2M, P.C., Melville, New York

4. Soil borings surrounding Drywell 20-08 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
SB-1	August 17, 1999	4 to 68-foot	Roux Associates, Inc.
SB-2	August 17, 1999	4 to 64-foot	Roux Associates, Inc.
SB-5	November 25, 1999	4 to 54-foot	Roux Associates, Inc.
SB-6	November 25, 1999	4 to 54-foot	Roux Associates, Inc.

Title:

CROSS-SECTION A-A' OF PCB CONCENTRATIONS AT DRYWELL 20-08

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared for: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. *Environmental Engineers*	Compiled by: N.G.	Date: 06/15/01	FIGURE
	Prepared by: B.H.CICIO	Scale: AS SHOWN	4
	Project Mgr.: W.F.	Office: NY	
	File No.: NGC0210205.CDR	Project No.: 70902Y	

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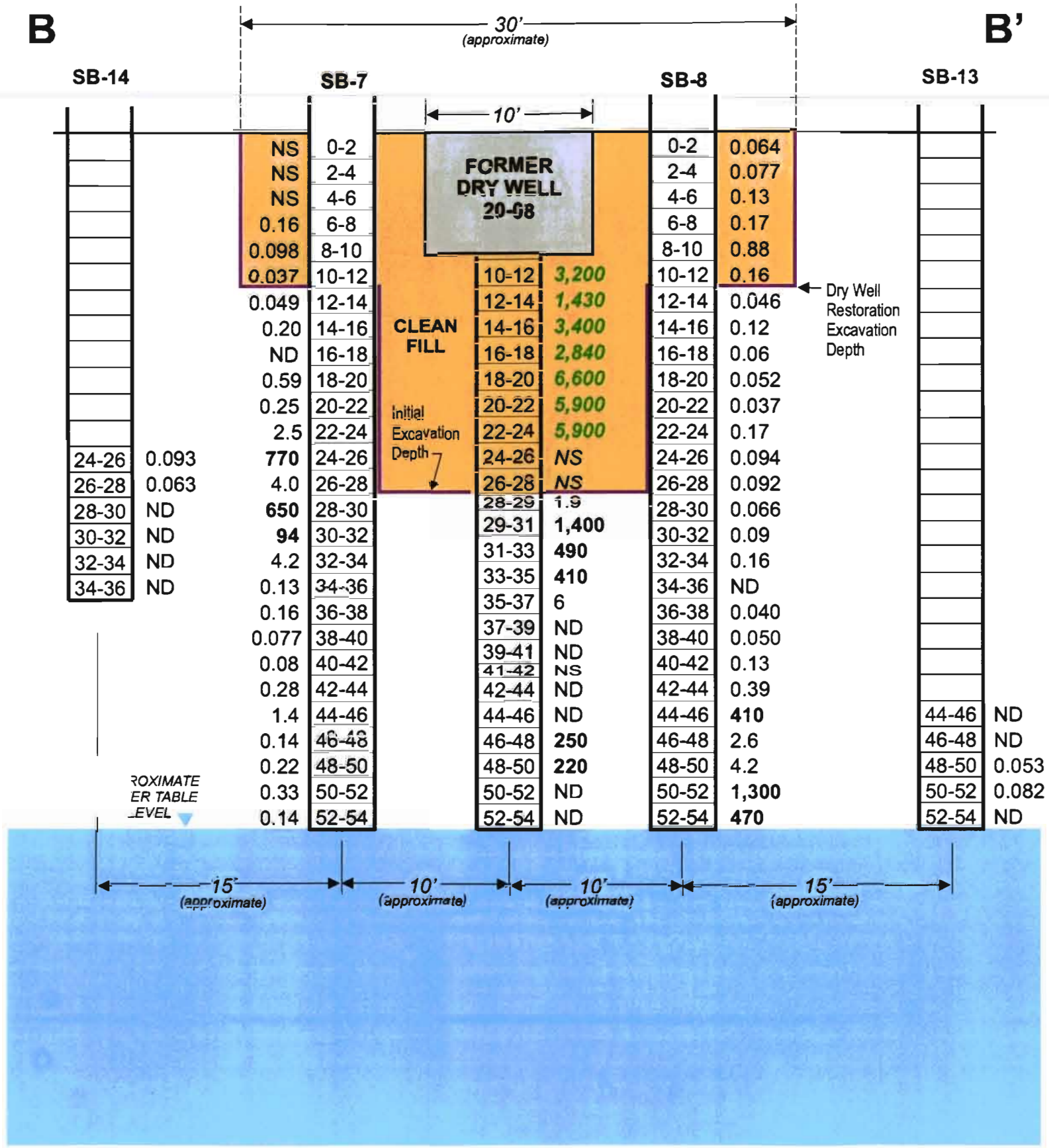

LEGEND

4.2	PCB concentration below 10 ppm NYSDEC Regulatory Standard[1,2]
94	PCB concentration above 10 ppm NYSDEC Regulatory Standard[1,2]
ND	non detect
NS	no sample collected
SB-7	soil boring designation
22-24 | 2.5	PCB concentration for sample taken above water table at sample depth interval of 22-24 ft below land surface
	polyethylene plastic sheet lining

NOTES:

1. NYSDEC Regulatory Standard based on *Technical and Administrative Guidance Memorandum HWR-94-4046 on the Determination of Soil Cleanup Objectives and Cleanup Levels, as revised January 24, 1994.*
2. PCB concentration represented in green italics reflect concentrations detected from contaminated soil removed and disposed off-site during previous remediation efforts.
3. Soil borings within and through Drywell 20-08 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
DRYWELL	October 9, 1997	10 to 14-foot	Radian International, Herdon, Virginia
DRYWELL	April 4, 1998	14 to 24-foot	H2M, P.C., Melville, New York
DRYWELL	June 23, 1998	28 to 29-foot	H2M, P.C., Melville, New York
DRYWELL	July 30, 1998	29 to 54-foot	H2M, P.C., Melville, New York

4. Soil borings surrounding Drywell 20-08 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
SB-7	November 29, 1999	6 to 54-foot	Roux Associates, Inc.
SB-8	November 30, 1999	0 to 54-foot	Roux Associates, Inc.
SB-13	April 18, 2000	44 to 54-foot	Roux Associates, Inc.
SB-14	April 18, 2000	24 to 36-foot	Roux Associates, Inc.

Title:

CROSS-SECTION B-B' OF PCB CONCENTRATIONS AT DRYWELL 20-08

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared for: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C.
Environmental Engineers

Compiled by: N.G.	Date: 06/15/01	FIGURE
Prepared by: B.H.CICIO	Scale: AS SHOWN	5
Project Mgr.: W.F.	Office: NY	
File No.: NGC0210205.CDR	Project No.: 70902Y	

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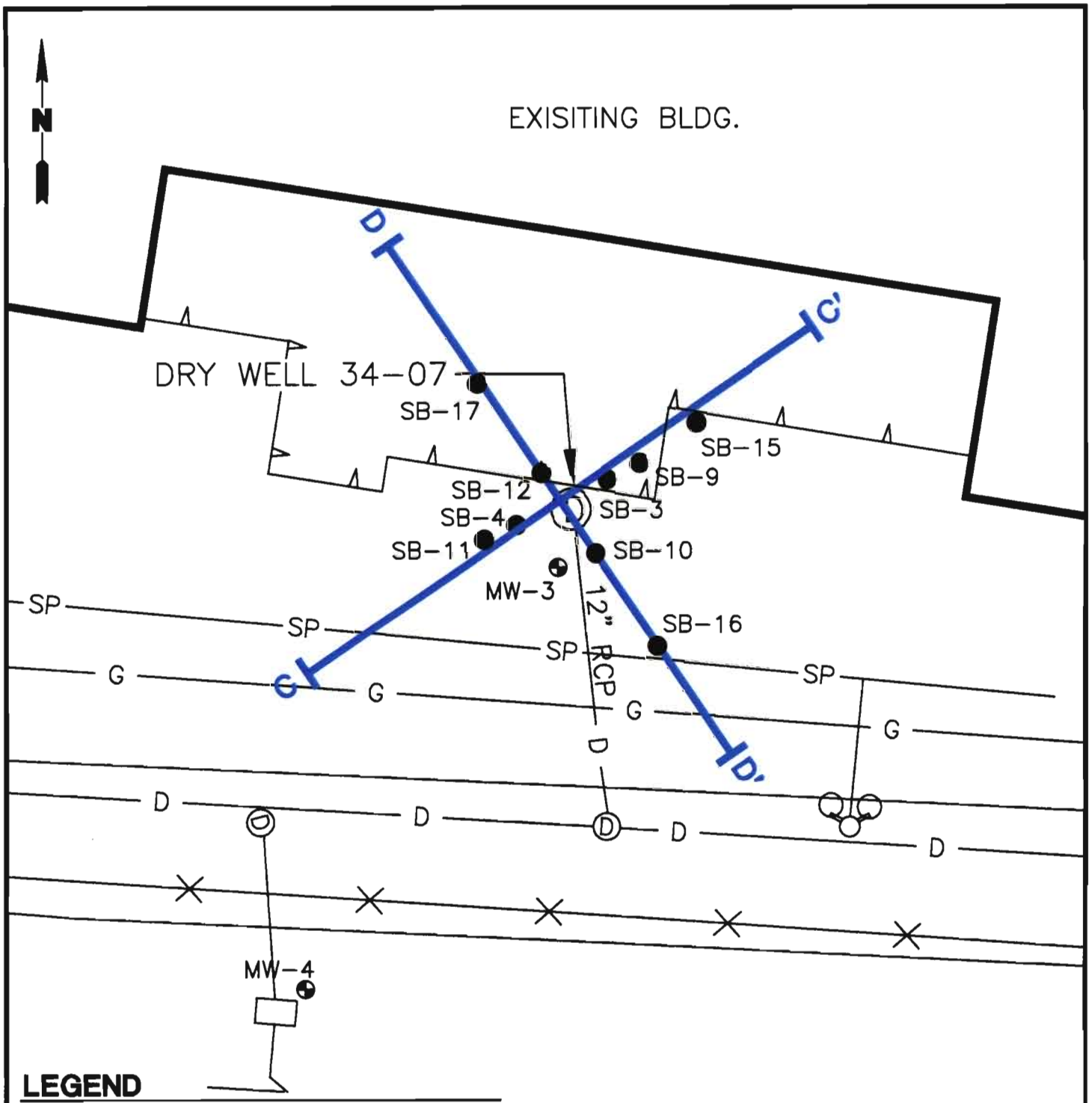

LEGEND

SB-3 ●	LOCATION AND DESIGNATION OF SOIL BORING
MW-3 ⊕	LOCATION AND DESIGNATION OF MONITORING WELL
∧ ∧	LOADING DOCK
C — C'	LINE OF CROSS SECTION
SP	SEWER PIPE
G	GAS LINE
D	DRAIN LINE
× ×	FENCE
Ⓓ	DRY WELL

20' 0 20'

Title:

DRYWELL 34-07 SOIL BORING LOCATION PLAN

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared For: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C.
ENVIRONMENTAL ENGINEERS

Compiled by: O.R.	Date: 06/15/01	FIGURE
Prepared by: R.K.	Scale: AS SHOWN	6
Project Mgr: W.F.	Office: NY	
File No: 70902001	Project: 70902Y	

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C

C'

SB-11		SB-4		SB-3		SB-9		SB-15	
1.5	0-2	NS	0-2	0-2	NS	0-2	NS		
0.20	2-4	NS	2-4	2-4	NS	2-4	NS		
0.072	4-6	0.15	4-6	4-6	**110**	4-6	NS		
0.32	6-8	NR	6-8	6-8	**67**	6-8	1.2		
ND	8-10	0.14	8-10	8-10	**72**	8-10	0.98		
ND	10-12	0.18	10-12	10-12	NR	10-12	0.93		
0.064	12-14	0.058	12-14	12-14	**38**	12-14	1.1		
0.16	14-16	0.091	14-16	14-16	**27**	14-16	0.75		
0.09	16-18	0.11	16-18	16-18	NR	16-18	0.35		
0.068	18-20	0.16	18-20	18-20	6.6	18-20	0.31		
0.18	20-22	0.14	20-22	20-22	4.9	20-22	5.6		
0.28	22-24	0.20	22-24	22-24	**14**	22-24	1.3		
86	24-26	0.77	24-26	24-26	0.48	24-26	**1,100**	24-26	0.052
0.37	26-28	**1,400**	26-28	26-28	0.078	26-28	**110**	26-28	0.043
0.20	28-30	**5,000**	28-30	28-30	2.4	28-30	2.2	28-30	ND
0.28	30-32	**2,600**	30-32	30-32	0.71	30-32	0.28	30-32	ND
0.26	32-34	**42**	32-34	32-34	0.68	32-34	0.33		
0.14	34-36	**40**	34-36	34-36	ND	34-36	0.56		
0.073	36-38	**42**	36-38	36-38	0.069	36-38	0.26		
0.067	38-40	**440**	38-40	38-40	0.76	38-40	0.10		
0.21	40-42	**100**	40-42	40-42	0.37	40-42	0.21		
0.066	42-44	**670**	42-44	42-44	0.12	42-44	0.037		
0.056	44-46	**14**	44-46	44-46	0.07	44-46	0.089		
0.10	46-48	0.54	46-48	46-48	0.25	46-48	0.06		
0.051	48-50	0.26	48-50	48-50	1.9	48-50	0.15		
0.14	50-52	4.7	50-52	50-52	0.56	50-52	0.045		
0.091	52-54	17	52-54	52-54	0.03	52-54	0.24		
0.10	54-56	2.1	54-56	54-56	NR	54-56	0.054		
		NR	56-58	56-58	0.39				
		0.32	58-60	58-60	0.1				
		0.67	60-62	60-62	0.46				
		1.7	62-64	62-64	0.075				
		5.6	64-66	64-66	0.064				
		0.13	66-68						

17' (approximate)

10'

FORMER DRY WELL 34-07

CLEAN FILL

Initial Excavation Depth

SB-4		SB-3	
10-12	*74*	10-12	NR
12-14	*4.1*	12-14	**38**
14-16	*16*	14-16	**27**
16-18	*1,500*	16-18	NR
18-20	*5,900*	18-20	6.6
20-22	*6,900*	20-22	4.9
22-24	*7,900*	22-24	**14**
24-26	*3,600*	24-26	0.48
26-28	*7,800*	26-28	0.078
28-29	**25,000**	28-30	2.4
29-30	NS		
30-32	**12,000**	30-32	0.71
32-34	**990**	32-34	0.68
34-36	**200**	34-36	ND
36-38	**860**	36-38	0.069
38-40	**18**	38-40	0.76
40-42	**31**	40-42	0.37
42-44	**300**	42-44	0.12
44-46	**38**	44-46	0.07
46-48	**42**	46-48	0.25
48-50	**15**	48-50	1.9
50-52	9	50-52	0.56
52-54	**440**	52-54	0.03
54-56	**39**	54-56	NR
		56-58	0.39
		58-60	0.1
		60-62	0.46
		62-64	0.075
		64-66	0.064

APPROXIMATE WATER TABLE LEVEL

10' (approximate) 10' (approximate) 10' (approximate) 10' (approximate) 10' (approximate)

LEGEND

- 4.9 — PCB concentration below 10 ppm NYSDEC Regulatory Standard[1,2]
- **14** — PCB concentration above 10 ppm NYSDEC Regulatory Standard[1,2]
- ND — non detect
- NR — no recovery
- NS — no sample collected
- **SB-4** — soil boring designation
- 54-56 | 2.1 — PCB concentration for sample taken above water table at sample depth interval of 54-56 ft below land surface
- 56-58 | NR — PCB concentration for sample taken below water table at sample depth interval of 56-58 ft below land surface
- polyethylene plastic sheet lining

NOTES:

1. NYSDEC Regulatory Standard based on *Technical and Administrative Guidance Memorandum HWR-94-4046 on the Determination of Soil Cleanup Objectives and Cleanup Levels, as revised January 24, 1994.*
2. PCB concentrations represented in green italics reflect concentrations detected from contaminated soil removed and disposed off-site during previous remediation efforts.
3. Soil borings within and through Drywell 34-07 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
DRYWELL	September 10, 1997	10 to 16-foot	Radian International, Herdon, Virginia
DRYWELL	October 9, 1997	16 to 22-foot	Radian International, Herdon, Virginia
DRYWELL	April 30, 1998	22 to 28-foot	H2M, P.C., Melville, New York
DRYWELL	June 9, 1998	28 to 29-foot	H2M, P.C., Melville, New York
DRYWELL	July 29, 1998	30 to 56-foot	H2M, P.C., Melville, New York

4. Soil borings surrounding Drywell 34-07 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
SB-3	August 18, 1999	4 to 66-foot	Roux Associates, Inc.
SB-4	August 20, 1999	4 to 68-foot	Roux Associates, Inc.
SB-9	November 30, 1999	6 to 56-foot	Roux Associates, Inc.
SB-11	December 2 & 5, 1999	0 to 56-foot	Roux Associates, Inc.
SB-15	April 19, 2000	24 to 32 foot	Roux Associates, Inc.

Title:

CROSS-SECTION C-C' OF PCB CONCENTRATIONS AT DRYWELL 34-07

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared for: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. *Environmental Engineers*	Compiled by: N.G.	Date: 06/15/01	FIGURE 7
	Prepared by: B.H.CICIO	Scale: AS SHOWN	
	Project Mgr.: W.F.	Office: NY	
	File No.: NGC0210205.CDR	Project No.: 70902Y	

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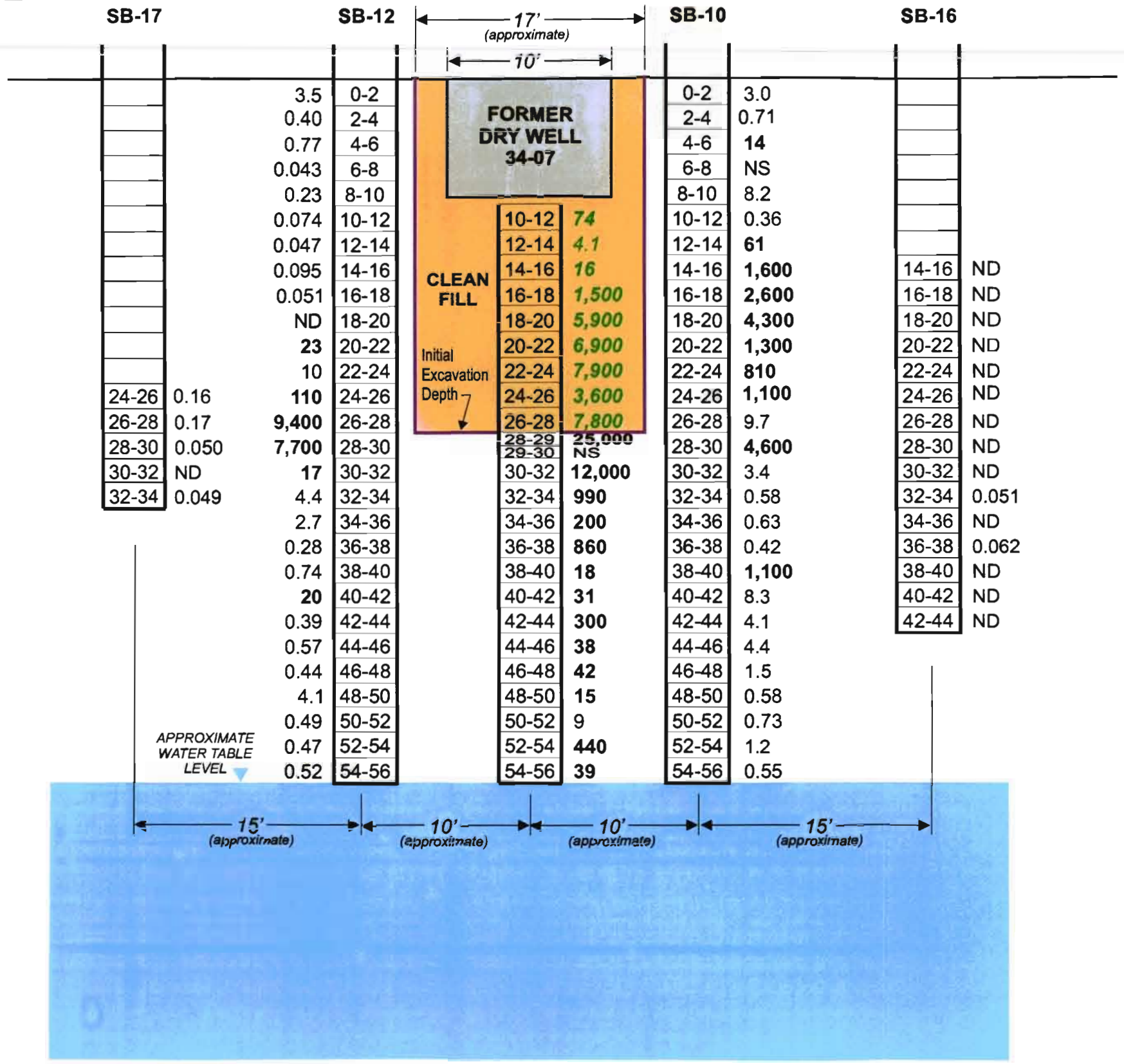

SB-17		SB-12			SB-10		SB-16	
		3.5	0-2		0-2	3.0		
		0.40	2-4		2-4	0.71		
		0.77	4-6		4-6	**14**		
		0.043	6-8		6-8	NS		
		0.23	8-10		8-10	8.2		
		0.074	10-12	10-12	10-12	0.36		
		0.047	12-14	12-14	12-14	**61**		
		0.095	14-16	14-16	14-16	**1,600**	14-16	ND
		0.051	16-18	16-18	16-18	**2,600**	16-18	ND
		ND	18-20	18-20	18-20	**4,300**	18-20	ND
		23	20-22	20-22	20-22	**1,300**	20-22	ND
		10	22-24	22-24	22-24	**810**	22-24	ND
24-26	0.16	**110**	24-26	24-26	24-26	**1,100**	24-26	ND
26-28	0.17	**9,400**	26-28	26-28	26-28	9.7	26-28	ND
28-30	0.050	**7,700**	28-30	~~28-29~~ ~~29-30~~	28-30	**4,600**	28-30	ND
30-32	ND	**17**	30-32	30-32	30-32	3.4	30-32	ND
32-34	0.049	4.4	32-34	32-34	32-34	0.58	32-34	0.051
		2.7	34-36	34-36	34-36	0.63	34-36	ND
		0.28	36-38	36-38	36-38	0.42	36-38	0.062
		0.74	38-40	38-40	38-40	**1,100**	38-40	ND
		20	40-42	40-42	40-42	8.3	40-42	ND
		0.39	42-44	42-44	42-44	4.1	42-44	ND
		0.57	44-46	44-46	44-46	4.4		
		0.44	46-48	46-48	46-48	1.5		
		4.1	48-50	48-50	48-50	0.58		
		0.49	50-52	50-52	50-52	0.73		
		0.47	52-54	52-54	52-54	1.2		
		0.52	54-56	54-56	54-56	0.55		

		SB-10			SB-16	
		0-2	3.0			
		2-4	0.71			
		4-6	**14**			
		6-8	NS			
		8-10	8.2			
10-12	*74*	10-12	0.36			
12-14	*4.1*	12-14	**61**			
14-16	*16*	14-16	**1,600**	14-16	ND	
16-18	*1,500*	16-18	**2,600**	16-18	ND	
18-20	*5,900*	18-20	**4,300**	18-20	ND	
20-22	*6,900*	20-22	**1,300**	20-22	ND	
22-24	*7,900*	22-24	**810**	22-24	ND	
24-26	*3,600*	24-26	**1,100**	24-26	ND	
26-28	*7,800*	26-28	9.7	26-28	ND	
~~28-29~~	~~25,000~~	28-30	**4,600**	28-30	ND	
~~29-30~~	NS	30-32	3.4	30-32	ND	
30-32	**12,000**	32-34	0.58	32-34	0.051	
32-34	**990**	34-36	0.63	34-36	ND	
34-36	**200**	36-38	0.42	36-38	0.062	
36-38	**860**	38-40	**1,100**	38-40	ND	
38-40	**18**	40-42	8.3	40-42	ND	
40-42	**31**	42-44	4.1	42-44	ND	
42-44	**300**	44-46	4.4			
44-46	**38**	46-48	1.5			
46-48	**42**	48-50	0.58			
48-50	**15**	50-52	0.73			
50-52	9	52-54	1.2			
52-54	**440**	54-56	0.55			
54-56	**39**					

LEGEND

3.4	PCB concentration below 10 ppm NYSDEC Regulatory Standard[1,2]
14	PCB concentration above 10 ppm NYSDEC Regulatory Standard[1,2]
ND	non detect
NS	no sample collected
SB-10	soil boring designation
6-8 | NS	PCB concentration for sample taken above water table at sample depth interval of 6-8 ft below land surface
	polyethylene plastic sheet lining

NOTES:

1. NYSDEC Regulatory Standard based on *Technical and Administrative Guidance Memorandum HWR-94-4046 on the Determination of Soil Cleanup Objectives and Cleanup Levels, as revised January 24, 1994.*
2. PCB concentrations represented in green italics reflect concentrations detected from contaminated soil removed and disposed off-site during previous remediation efforts.
3. Soil borings within and through Drywell 34-07 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
DRYWELL	September 10, 1997	10 to 16-foot	Radian International, Herdon, Virginia
DRYWELL	October 9, 1997	16 to 22-foot	Radian International, Herdon, Virginia
DRYWELL	April 30, 1998	22 to 28-foot	H2M, P.C., Melville, New York
DRYWELL	June 9, 1998	28 to 29-foot	H2M, P.C., Melville, New York
DRYWELL	July 29, 1998	30 to 56-foot	H2M, P.C., Melville, New York

4. Soil borings surrounding Drywell 34-07 were installed and sampled according to the following schedule:

Soil Boring	Date	Sampling Interval	Consultant
SB-10	December 1 & 2, 1999	0 to 56-foot	Roux Associates, Inc.
SB-12	December 5, 1999	0 to 56-foot	Roux Associates, Inc.
SB-16	April 19, 2000	16 to 44-foot	Roux Associates, Inc.
SB-17	April 24, 2000	24 to 34-foot	Roux Associates, Inc.

Title:

CROSS-SECTION D-D' OF PCB CONCENTRATIONS AT DRYWELL 34-07

PLANT 3 DRY WELLS 20-08 AND 34-07
SITE CHARACTERIZATION REPORT

Prepared for: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. *Environmental Engineers*	Compiled by: N.G.	Date: 06/15/01	FIGURE 8
	Prepared by: B.H.CICIO	Scale: AS SHOWN	
	Project Mgr.: W.F.	Office: NY	
	File No.: NGC0210205.CDR	Project No.: 70902Y	

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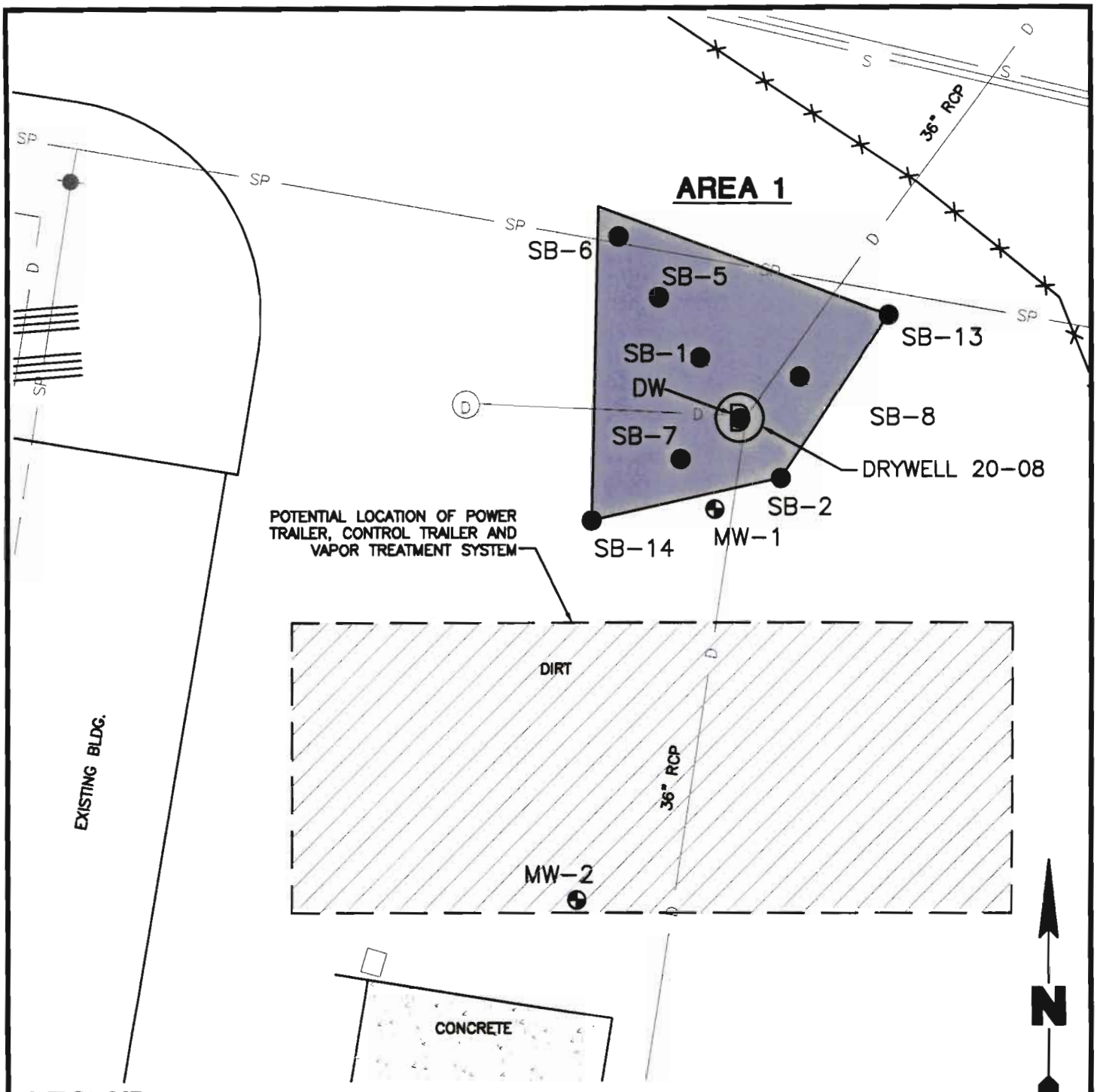


LEGEND

SB-2 ●	LOCATION AND DESIGNATION OF SOIL BORING
MW-1 ⊕	LOCATION AND DESIGNATION OF MONITORING WELL
(D)	DRY WELL
SP	SEWER PIPE
D	DRAIN LINE
✕ ✕ ✕	FENCE
▭	POTENTIAL EXCAVATION AREA

NOTES

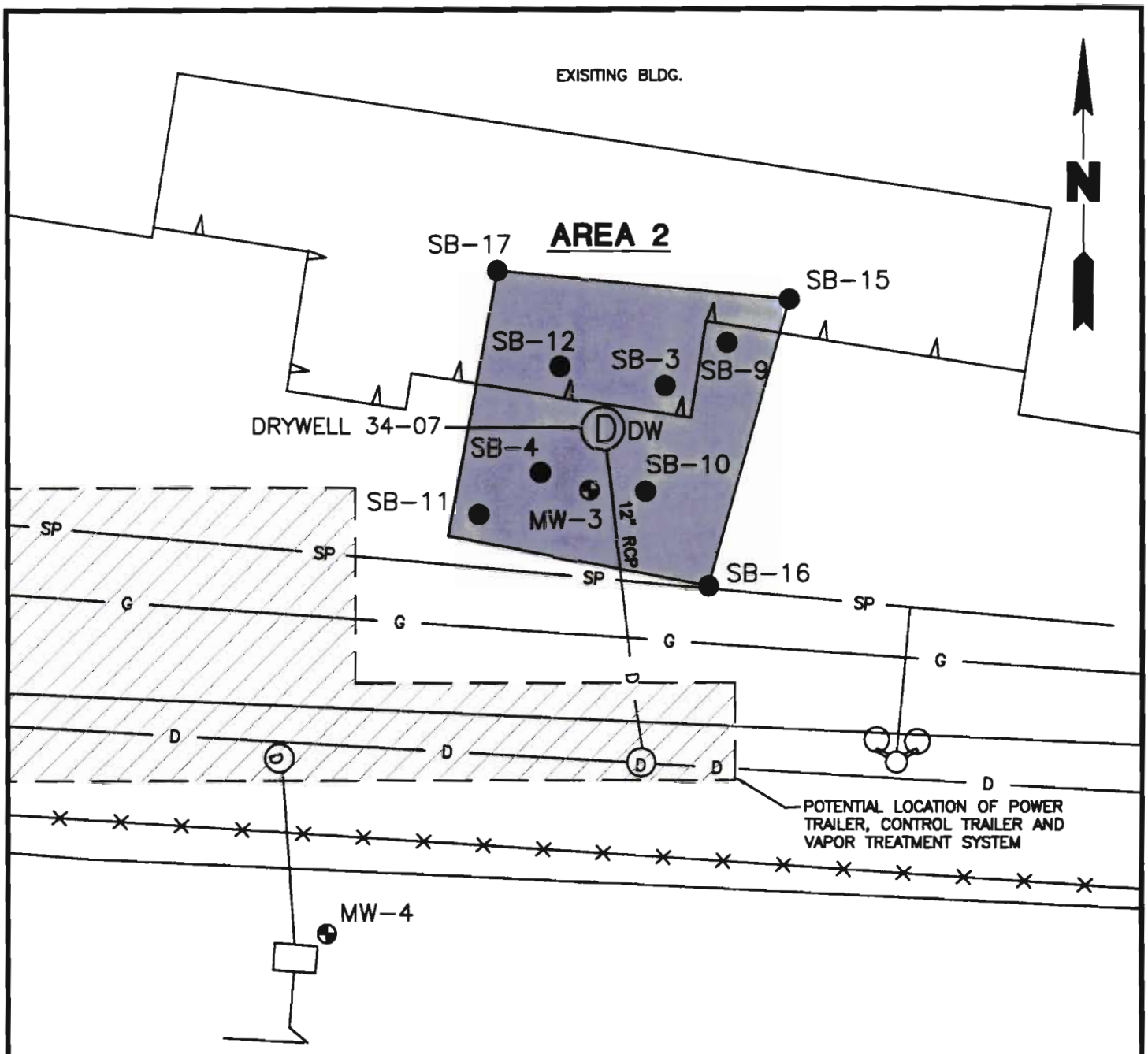
1. AREA 1 => 1,125 SF.

Title: **DRYWELL 20-08 POTENTIAL EXCAVATION OR TREATMENT UNIT AREAS**

PLANT 3 DRY WELLS 20-08 AND 34-07
FOCUSED FEASIBILITY STUDY
BETHPAGE, NEW YORK

Prepared For: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C. ENVIRONMENTAL ENGINEERS	Compiled by: O.R.	Date: 06/14/01	FIGURE 9
	Prepared by: O.R./R.M.C.	Scale: AS SHOWN	
	Project Mgr: O.R.	Office: NY	
	File No: 70902002	Project: 70902Y	



LEGEND

SB-3 ●	LOCATION AND DESIGNATION OF SOIL BORING
MW-3 ⊕	LOCATION AND DESIGNATION OF MONITORING WELL
(D)	DRY WELL
⩚	LOADING DOCK
SP	SEWER PIPE
G	GAS LINE
D	DRAIN LINE
✕	FENCE
▭	POTENTIAL EXCAVATION AREA

20' 0 20'

NOTES

1. AREA 2 => 1,375 SF.

Title: **DRYWELL 34-07 POTENTIAL EXCAVATION OR TREATMENT UNIT AREAS**

PLANT 3 DRY WELLS 20-08 AND 34-07
FOCUSED FEASIBILITY STUDY
BETHPAGE, NEW YORK

Prepared For: NORTHROP GRUMMAN

REMEDIAL ENGINEERING, P.C.
ENVIRONMENTAL ENGINEERS

Compiled by: O.R.	Date: 06/14/01	FIGURE
Prepared by: O.R./R.M.C.	Scale: AS SHOWN	10
Project Mgr: O.R.	Office: NY	
File No: 70902003	Project: 70902Y	

APPENDIX A

TABLES SUMMARIZING PCB DATA IN SOILS

Table 1. Summary of polychlorinated Biphenyls Detected in Soil Boring SB-1 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

	Sample Designation:	SB-1	SB-1	SB-1	SB-1	SB-1	SB-1	SB-1
	Sample Interval:	4-6	6-8	8-10	10-12	12-14	14-16	16-18
	Sample Date:	8/17/99	8/17/99	8/17/99	8/17/99	8/17/99	8/17/99	8/17/99
Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)							
Aroclor-1016	NS	.5U	.6U	.6U	.5U	.5U	.5U	.5U
Aroclor-1221	NS	.5U	.6U	.6U	.5U	.5U	.5U	.5U
Aroclor-1232	NS	.5U	.6U	.6U	.5U	.5U	.5U	.5U
Aroclor-1242	NS	.5U	.6U	.6U	.5U	.5U	.5U	.5U
Aroclor-1248	NS	19J	.6U	.6U	.5U	.5U	11J	16J
Aroclor-1254	NS	1U	1.2U	1.1U	1U	1U	1U	1U
Aroclor-1260	NS	1U	1.2U	1.1U	1U	1U	1U	1U
Total PCBs (subsurface):	10,000	19J	0	0	0	0	11J	16J

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 1. Summary of polychlorinated Biphenyls Detected in Soil Boring SB-1 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-1 Sample Interval: 18-20 Sample Date: 8/17/99	SB-1 20-22 8/17/99	SB-1 22-24 8/17/99	SB-1/DL 22-24 8/17/99	SB-1/DL 24-26 8/17/99	SB-1/DL 26-28 8/17/99	SB-1/DL 28-30 8/17/99
Aroclor-1016	NS	.5U	.6U	.5U	350U	40000000U	7500U	88000U
Aroclor-1221	NS	.5U	.6U	.5U	350U	40000000U	7500U	88000U
Aroclor-1232	NS	.5U	.6U	.5U	350U	40000000U	7500U	88000U
Aroclor-1242	NS	0.5	.6U	2900E	3100D	45000000DP	5500000D	610000DP
Aroclor-1248	NS	41	.6U	.5U	350U	40000000U	7500U	88000U
Aroclor-1254	NS	1U	1.1U	1U	710U	81000000U	15000U	180000U
Aroclor-1260	NS	1U	1.1U	1U	710U	81000000U	15000U	180000U
Total PCBs (subsurface):	10,000	41	0	2900E	3100D	**45000000DP**	**5500000D**	**610000DP**

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 1. Summary of polychlorinated Biphenyls Detected in Soil Boring SB-1 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-1/DL Sample Interval: 30-32 Sample Date: 8/17/99	Sample Designation: SB-1/DL Sample Interval: 32-34 Sample Date: 8/17/99	Sample Designation: SB-1DUP/DL Sample Interval: 32-34 Sample Date: 8/17/99	Sample Designation: SB-1/DL Sample Interval: 34-36 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 36-38 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 38-40 Sample Date: 8/17/99	Sample Designation: SB-1/DL Sample Interval: 40-42 Sample Date: 8/17/99
Aroclor-1016	NS	18000U	8800U	35000U	350U	180U	180U	1800U
Aroclor-1221	NS	18000U	8800U	35000U	350U	180U	180U	1800U
Aroclor-1232	NS	18000U	8800U	35000U	350U	180U	180U	1800U
Aroclor-1242	NS	95000DP	42000DP	130000DP	2200D	1300P	810P	14000D
Aroclor-1248	NS	18000U	8800U	35000U	350U	180U	180U	1800U
Aroclor-1254	NS	35000U	18000U	70000U	700U	350U	350U	3600U
Aroclor-1260	NS	35000U	18000U	70000U	700U	350U	350U	3600U
Total PCBs (subsurface):	10,000	**95000DP**	**42000DP**	**130000DP**	2200D	1300P	810P	**14000D**

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 1. Summary of polychlorinated Biphenyls Detected in Soil Boring SB-1 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-1/DL Sample Interval: 42-44 Sample Date: 8/17/99	Sample Designation: SB-1/DL Sample Interval: 44-46 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 46-48 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 48-50 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 50-52 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 52-54 Sample Date: 8/17/99	Sample Designation: SB-1 Sample Interval: 54-56 Sample Date: 8/17/99
Aroclor-1016	NS	91000U	1800U	180U	700U	400U	180U	390U
Aroclor-1221	NS	91000U	1800U	180U	700U	400U	180U	390U
Aroclor-1232	NS	91000U	1800U	180U	700U	400U	180U	390U
Aroclor-1242	NS	720000DP	97000DP	860	6400	790	740	1300
Aroclor-1248	NS	91000U	1800U	180U	700U	400U	180U	390U
Aroclor-1254	NS	180000U	35000U	350U	1400U	800U	350U	770U
Aroclor-1260	NS	180000U	35000U	350U	1400U	800U	350U	770U
Total PCBs (subsurface):	10,000	**720000DP**	**97000DP**	860	6400	790	740	1300

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 1. Summary of polychlorinated Biphenyls Detected in Soil Boring SB-1 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-1 Sample Interval: 56-58 Sample Date: 8/17/99	SB-1 58-60 8/17/99	SB-1 60-62 8/17/99	SB-1 62-64 8/17/99	SB-1DUP 62-64 8/17/99	SB-1 64-66 8/17/99	SB-1/DL 66-68 8/17/99
Aroclor-1016	NS	190U	190U	1900U	190U	380U	380U	200U
Aroclor-1221	NS	190U	190U	1900U	190U	380U	380U	200U
Aroclor-1232	NS	190U	190U	1900U	190U	380U	380U	200U
Aroclor-1242	NS	320	1500P	8900P	920P	2100P	1000P	930D
Aroclor-1248	NS	190U	190U	1900U	190U	380U	380U	200U
Aroclor-1254	NS	380U	380U	3900U	390U	770U	760U	390U
Aroclor-1260	NS	380U	380U	3900U	390U	770U	760U	390U
Total PCBs (subsurface):	10,000	320	1500P	8900P	920P	2100P	1000P	930D

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 2. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-2 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-2 4-6 8/17/99	SB-2 6-8 8/17/99	SB-2 8-10 8/17/99	SB-2 10-12 8/17/99	SB-2 12-14 8/17/99	SB-2 DUP 14-16 8/17/99	SB-2 16-18 8/17/99
Aroclor-1016	NS	18U	18U	17U	17U	17U	19U	19U
Aroclor-1221	NS	18U	18U	17U	17U	17U	19U	19U
Aroclor-1232	NS	18U	18U	17U	17U	17U	19U	19U
Aroclor-1242	NS	130	37	40	31J	30J	19U	19U
Aroclor-1248	NS	18U	18U	17U	17U	17U	19U	19U
Aroclor-1254	NS	35U	36U	34U	35U	34U	38U	39U
Aroclor-1260	NS	35U	36U	34U	35U	34U	38U	39U
Total PCBs (subsurface):	10,000	130	37	40	31J	30J	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 2. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-2 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-2 18-20 8/17/99	SB-2 20-22 8/17/99	SB-2 24-26 8/17/99	SB-2 26-28 8/17/99	SB-2 28-30 8/17/99	SB-2 30-32 8/17/99	SB-2 32-34 8/17/99
Aroclor-1016	NS	17U	18U	17U	17U	17U	17U	18U
Aroclor-1221	NS	17U	18U	17U	17U	17U	17U	18U
Aroclor-1232	NS	17U	18U	17U	17U	17U	17U	18U
Aroclor-1242	NS	41	45	63	17J	61	42	23
Aroclor-1248	NS	17U	18U	17U	17U	17U	17U	18U
Aroclor-1254	NS	34U	35U	34U	35U	34U	35U	35U
Aroclor-1260	NS	34U	35U	34U	35U	34U	35U	35U
Total PCBs (subsurface):	10,000	41	45	63	17J	61	42	23

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

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P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 2. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-2 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-2 34-36 8/17/99	SB-2 36-38 8/17/99	SB-2 38-40 8/17/99	SB-2 40-42 8/17/99	SB-2 42-44 8/17/99	SB-2 46-48 8/17/99	SB-2 48-50 8/17/99
Aroclor-1016	NS	18U	27U	18U	18U	21U	18U	18U
Aroclor-1221	NS	18U	27U	18U	18U	21U	18U	18U
Aroclor-1232	NS	18U	27U	18U	18U	21U	18U	18U
Aroclor-1242	NS	40	69	22	18U	23	18U	51
Aroclor-1248	NS	18U	27U	18U	18U	21U	18U	18U
Aroclor-1254	NS	35U	54U	35U	36U	42U	36U	35U
Aroclor-1260	NS	35U	54U	35U	36U	42U	36U	35U
Total PCBs (subsurface):	10,000	40	69	22	0	23	0	51

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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NS - No standard

U - This qualifier indicates compound analyzed for but not detected

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 2. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-2 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-2 50-52 8/17/99	SB-2 52-54 8/17/99	SB-2 54-56 8/17/99	SB-2 56-58 8/17/99	SB-2 58-60 8/17/99	SB-2 60-62 8/17/99	SB-2 62-64 8/17/99	SB-2 64-66 8/17/99
Aroclor-1016	NS	18U	17U	18U	18U	19U	19U	19U	19U
Aroclor-1221	NS	18U	17U	18U	18U	19U	19U	19U	19U
Aroclor-1232	NS	18U	17U	18U	18U	19U	19U	19U	19U
Aroclor-1242	NS	47	37	27	34	40	34	19U	19U
Aroclor-1248	NS	18U	17U	18U	18U	19U	19U	19U	19U
Aroclor-1254	NS	35U	35U	36U	36U	38U	38U	38U	38U
Aroclor-1260	NS	35U	35U	36U	36U	38U	38U	38U	38U
Total PCBs (subsurface):	10,000	47	37	27	34	40	34	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

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DUP - This suffix indicates a duplicate sample

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Table 3. Summary of Polychlorinated Biphenyls Detected in soil Boring SB-3 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-3/DL 4-6 8/18/99	SB-3/DL 6-8 8/18/99	SB-3/DL 8-10 8/18/99	SB-3/DL 12-14 8/18/99	SB-3/DL 14-16 8/18/99	SB-3/DL 18-20 8/18/99	SB-3/DL 22-24 8/18/99	SB-3/DL 24-25 8/18/99
Aroclor-1016	NS	14000U	8600U	15000U	7100U	3400U	860U	1900U	200U
Aroclor-1221	NS	14000U	8600U	15000U	7100U	3400U	860U	1900U	200U
Aroclor-1232	NS	14000U	8600U	15000U	7100U	3400U	860U	1900U	200U
Aroclor-1242	NS	110000D	67000DP	72000D	38000DP	27000D	6600D	14000D	480D
Aroclor-1248	NS	14000U	8600U	15000U	7100U	3400U	860U	1900U	200U
Aroclor-1254	NS	28000U	17000U	31000U	14000U	6800U	1700U	3800U	390U
Aroclor-1260	NS	28000U	17000U	31000U	14000U	6800U	1700U	3800U	390U
Total PCBs (subsurface):	10,000	**110000D**	**67000DP**	**72000D**	**38000DP**	**27000D**	6600D	**14000D**	480D

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

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D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 3. Summary of Polychlorinated Biphenyls Detected in soil Boring SB-3 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-3 26-28 8/18/99	SB-3/DL 28-30 8/18/99	SB-3 30-32 8/18/99	SB-3/DUP 30/32 8/18/99	SB-3/DL 30-32 8/18/99	SB-3/DL 32-34 8/18/99	SB-3 34-36 8/18/99	SB-3 36-38 8/18/99
Aroclor-1016	NS	19U	890U	20U	18U	370U	360U	21U	18U
Aroclor-1221	NS	19U	890U	20U	18U	370U	360U	21U	18U
Aroclor-1232	NS	19U	890U	20U	18U	370U	360U	21U	18U
Aroclor-1242	NS	78	2400D	89P	140E	710D	680D	21U	69
Aroclor-1248	NS	19U	890U	20U	18U	370U	360U	21U	18U
Aroclor-1254	NS	38U	1800U	41U	37U	740U	720U	42U	35U
Aroclor-1260	NS	38U	1800U	41U	37U	740U	720U	42U	35U
Total PCBs (subsurface):	10,000	78	2400D	89P	140E	710D	680D	0	69

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 3. Summary of Polychlorinated Biphenyls Detected in soil Boring SB-3 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-3 38-40 8/18/99	SB-3 40-42 8/18/99	SB-3 42-44 8/18/99	SB-3 44-46 8/18/99	SB-3 46-48 8/18/99	SB-3 48-50 8/18/99	SB-3 50-52 8/18/99	SB-3 52-54 8/18/99
Aroclor-1016	NS	180U	180U	37U	18U	190U	1800U	360U	19U
Aroclor-1221	NS	180U	180U	37U	18U	190U	1800U	360U	19U
Aroclor-1232	NS	180U	180U	37U	18U	190U	1800U	360U	19U
Aroclor-1242	NS	760	370	120	70	250	1900	560	30
Aroclor-1248	NS	180U	180U	37U	18U	190U	1800U	360U	19U
Aroclor-1254	NS	360U	350U	74U	36U	380U	3600U	720U	39U
Aroclor-1260	NS	360U	350U	74U	36U	380U	3600U	720U	39U
Total PCBs (subsurface):	10,000	760	370	120	70	250	1900	560	30

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

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D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 3. Summary of Polychlorinated Biphenyls Detected in soil Boring SB-3 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-3 52-54 8/18/99	SB-3 56-58 8/18/99	SB-3 58-60 8/18/99	SB-3 60-62 8/18/99	SB-3 62-64 8/18/99	SB-3 64-66 8/18/99
Aroclor-1016	NS	19U	79U	20U	77U	19U	19U
Aroclor-1221	NS	19U	79U	20U	77U	19U	19U
Aroclor-1232	NS	19U	79U	20U	77U	19U	19U
Aroclor-1242	NS	30	390	100	460	75	64
Aroclor-1248	NS	19U	79U	20U	77U	19U	19U
Aroclor-1254	NS	39U	160U	39U	150U	38U	39U
Aroclor-1260	NS	39U	160U	39U	150U	38U	39U
Total PCBs (subsurface):	10,000	30	390	100	460	75	64

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

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U - This qualifier indicates compound analyzed for but not detected

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 4. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-4 Plant 3 Dry Well 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-4 4-6 8/20/99	SB-4 8-10 8/20/99	SB-4/DL 10-12 8/20/99	SB-4 12-14 8/20/99	SB-4 14-16 8/20/99	SB-4 DUP 14-16 8/20/99	SB-4 16-18 8/20/99
Aroclor-1016	NS	18U	17U	35U	37U	34U	40U	37U
Aroclor-1221	NS	18U	17U	35U	37U	34U	40U	37U
Aroclor-1232	NS	18U	17U	35U	37U	34U	40U	37U
Aroclor-1242	NS	150	140	180D	58P	91P	64	110P
Aroclor-1248	NS	18U	17U	35U	37U	34U	40U	37U
Aroclor-1254	NS	35U	34U	69U	75U	69U	79U	74U
Aroclor-1260	NS	35U	34U	69U	75U	69U	79U	74U
Total PCBs (subsurface):	10,000	150	140	180D	58P	91P	64	110P

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 4. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-4 Plant 3 Dry Well 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-4 18-20 8/20/99	SB-4 20-22 8/20/99	SB-4 22-24 8/20/99	SB-4 24-26 8/20/99	SB-4 26-28 8/20/99	SB-4/DL 28-30 8/20/99	SB-4/DL 30-32 8/20/99
Aroclor-1016	NS	69U	70U	70U	190U	180000U	720000U	720000U
Aroclor-1221	NS	69U	70U	70U	190U	180000U	720000U	720000U
Aroclor-1232	NS	69U	70U	70U	190U	180000U	720000U	720000U
Aroclor-1242	NS	160P	140P	200P	770P	180000U	5000000D	2600000D
Aroclor-1248	NS	69U	70U	70U	190U	1400000	720000U	720000U
Aroclor-1254	NS	140U	140U	140U	390U	360000U	1400000U	1400000U
Aroclor-1260	NS	140U	140U	140U	390U	360000U	1400000U	1400000U
Total PCBs (subsurface):	10,000	160P	140P	200P	770P	**1400000**	**5000000D**	**2600000D**

Notes:

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Table 4. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-4 Plant 3 Dry Well 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-4 32-34 8/20/99	SB-4 34-36 8/20/99	SB-4 36-38 8/20/99	SB-4 38-40 8/20/99	SB-4 40-42 8/20/99	SB-4 42-44 8/20/99	SB-4 44-46 8/20/99
Aroclor-1016	NS	7100U	890U	8700U	180000U	18000U	94000U	1800U
Aroclor-1221	NS	7100U	890U	8700U	180000U	18000U	94000U	1800U
Aroclor-1232	NS	7100U	890U	8700U	180000U	18000U	94000U	1800U
Aroclor-1242	NS	42000	40000	42000	440000	100000	670000	14000
Aroclor-1248	NS	7100U	890U	8700U	180000U	18000U	94000U	1800U
Aroclor-1254	NS	14000U	1800U	17000U	350000U	35000U	190000U	3600U
Aroclor-1260	NS	14000U	1800U	17000U	350000U	35000U	190000U	3600U
Total PCBs (subsurface):	10,000	**42000**	**40000**	**42000**	**440000**	**100000**	**670000**	**14000**

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

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P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 4. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-4 Plant 3 Dry Well 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-4 46-48 8/20/99	SB-4 48-50 8/20/99	SB-4 50-52 8/20/99	SB-4 52-54 8/20/99	SB-4 54-56 8/20/99	SB-4 58-60 8/20/99	SB-4 60-62 8/20/99
Aroclor-1016	NS	98U	110U	1800U	7500U	900U	100U	210U
Aroclor-1221	NS	98U	110U	1800U	7500U	900U	100U	210U
Aroclor-1232	NS	98U	110U	1800U	7500U	900U	100U	210U
Aroclor-1242	NS	540	260	4700	17000	2100	320	670
Aroclor-1248	NS	98U	110U	1800U	7500U	900U	100U	210U
Aroclor-1254	NS	200U	210U	3600U	15000U	1800U	200U	430U
Aroclor-1260	NS	200U	210U	3600U	15000U	1800U	200U	430U
Total PCBs (subsurface):	10,000	540	260	4700	**17000**	2100	320	670

Notes:

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ft bls - Feet below land surface

NS - No standard

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 4. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-4 Plant 3 Dry Well 20-08 and 34-07 Site Characterization Report Northrop Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-4 62-64 8/20/99	SB-4 DUP 62-64 8/20/99	SB-4 64-66 8/20/99	SB-4 66-68 8/20/99
Aroclor-1016	NS	200U	410U	2100U	81U
Aroclor-1221	NS	200U	410U	2100U	81U
Aroclor-1232	NS	200U	410U	2100U	81U
Aroclor-1242	NS	490	1700	5600	130
Aroclor-1248	NS	200U	410U	2100U	81U
Aroclor-1254	NS	400U	830U	4300U	160U
Aroclor-1260	NS	400U	830U	4300U	160U
Total PCBs (subsurface):	10,000	490	1700	5600	130

Notes:

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B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 5. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-5 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-5 4-6 11/23/99	SB-5 6-8 11/23/99	SB-5 8-10 11/23/99	SB-5 10-12 11/23/99	SB-5 12-14 11/23/99	SB-5 14-16 11/23/99	SB-5 16-18 11/23/99
Aroclor-1016	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1221	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1232	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1242	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1248	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1254	NS	38U	38U	34U	33U	33U	34U	34U
Aroclor-1260	NS	38U	38U	34U	33U	33U	34U	34U
Total PCBs (subsurface):	10,000	0	0	0	0	0	0	0

Notes:

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µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 5. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-5 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-5 18-20 11/23/99	SB-5 20-22 11/23/99	SB-5 22-24 11/23/99	SB-5/DL 24-26 11/23/99	SB-5/DL 26-28 11/23/99	SB-5/DL 28-30 11/23/99	SB-5/DL 30-32 11/23/99
Aroclor-1016	NS	33U	34U	34U	39000U	360U	34000U	3400U
Aroclor-1221	NS	33U	34U	34U	39000U	360U	34000U	3400U
Aroclor-1232	NS	33U	34U	34U	39000U	360U	34000U	3400U
Aroclor-1242	NS	33U	34U	34U	39000U	360U	34000U	3400U
Aroclor-1248	NS	33U	34U	34U	1700000D	10000D	310000D	89000D
Aroclor-1254	NS	33U	34U	34U	39000U	360U	34000U	3400U
Aroclor-1260	NS	33U	34U	34U	39000U	360U	34000U	3400U
Total PCBs (subsurface):	10,000	0	0	0	**1700000D**	**10000D**	**310000D**	**89000D**

Notes:

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Table 5. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-5 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-5 32-34 11/23/99	SB-5/DL 34-36 11/23/99	SB-5 36-38 11/23/99	SB-5 38-40 11/23/99	SB-5 40-42 11/23/99	SB-5 42-44 11/23/99	SB-5 44-46 11/23/99
Aroclor-1016	NS	33U	340U	34U	35U	35U	33U	35U
Aroclor-1221	NS	33U	340U	34U	35U	35U	33U	35U
Aroclor-1232	NS	33U	340U	34U	35U	35U	33U	35U
Aroclor-1242	NS	33U	340U	34U	35U	35U	33U	35U
Aroclor-1248	NS	1500	10000D	350	780	880	450	190
Aroclor-1254	NS	33U	340U	34U	35U	35U	33U	35U
Aroclor-1260	NS	33U	340U	34U	35U	35U	33U	35U
Total PCBs (subsurface):	10,000	1500	**10000D**	350	780	880	450	190

Notes:

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NS - No standard

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

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Table 5: Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-5 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-5/DUP 44-46 11/23/99	SB-5 46-48 11/23/99	SB-5 48-50 11/23/99	SB-5 50-52 11/23/99	SB-5 52-54 11/23/99
Aroclor-1016	NS	35U	34U	34U	33U	37U
Aroclor-1221	NS	35U	34U	34U	33U	37U
Aroclor-1232	NS	35U	34U	34U	33U	37U
Aroclor-1242	NS	35U	34U	34U	33U	37U
Aroclor-1248	NS	180	1000	290	1600	230
Aroclor-1254	NS	35U	34U	34U	33U	37U
Aroclor-1260	NS	35U	34U	34U	33U	37U
Total PCBs (subsurface):	10,000	180	1000	290	1600	230

Notes:

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

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Table 6. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-6 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-6 4-6 11/25/99	SB-6 6-8 11/25/99	SB-6 8-10 11/25/99	SB-6 10-12 11/25/99	SB-6 12-14 11/25/99	SB-6 14-16 11/25/99	SB-6 16-18 11/25/99
Aroclor-1016	NS	39U	34U	34U	34U	33U	34U	33U
Aroclor-1221	NS	39U	34U	34U	34U	33U	34U	33U
Aroclor-1232	NS	39U	34U	34U	34U	33U	34U	33U
Aroclor-1242	NS	39U	34U	34U	34U	33U	34U	43P
Aroclor-1248	NS	39U	34U	34U	34U	33U	34U	33U
Aroclor-1254	NS	39U	34U	34U	34U	33U	34U	33U
Aroclor-1260	NS	39U	34U	34U	34U	33U	34U	33U
Total PCBs (subsurface):	10,000	0	0	0	0	0	0	43

Notes:

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Table 6. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-6 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-6 18-20 11/25/99	SB-6 20-22 11/25/99	SB-6 22-24 11/25/99	SB-6/DL 24-26 11/25/99	SB-6 26-28 11/25/99	SB-6/DL 28-30 11/25/99	SB-6/DL 30-32 11/25/99
Aroclor-1016	NS	33U	34U	33U	810U	41U	350U	1700U
Aroclor-1221	NS	33U	34U	33U	810U	41U	350U	1700U
Aroclor-1232	NS	33U	34U	33U	810U	41U	350U	1700U
Aroclor-1242	NS	33U	34U	33U	810U	41U	350U	1700U
Aroclor-1248	NS	33U	34U	33U	20000D	1100	5200D	20000D
Aroclor-1254	NS	33U	34U	33U	810U	41U	350U	1700U
Aroclor-1260	NS	33U	34U	33U	810U	41U	350U	1700U
Total PCBs (subsurface):	10,000	0	0	0	**20000D**	1100	5200D	**20000D**

Notes:

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Table 6. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-6 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-6/DL 32-34 11/25/99	SB-6 34-36 11/25/99	SB-6/DUP 34-36 11/25/99	SB-6 36-38 11/25/99	SB-6 38-40 11/25/99	SB-6 40-42 11/25/99	SB-6 42-44 11/25/99
Aroclor-1016	NS	170U	34U	33U	34U	35U	35U	35U
Aroclor-1221	NS	170U	34U	33U	34U	35U	35U	35U
Aroclor-1232	NS	170U	34U	33U	34U	35U	35U	35U
Aroclor-1242	NS	170U	34U	49P	34U	35U	35U	35U
Aroclor-1248	NS	1600D	130	33U	540	35U	440	300
Aroclor-1254	NS	170U	34U	33U	34U	35U	35U	35U
Aroclor-1260	NS	170U	34U	33U	34U	35U	35U	35U
Total PCBs (subsurface):	10,000	1600D	130	49	540	0	440	300

Notes:

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Table 6. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-6 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-6 44-46 11/25/99	SB-6 46-48 11/25/99	SB-6 48-50 11/25/99	SB-6 50-52 11/25/99	SB-6 52-54 11/25/99
Aroclor-1016	NS	33U	34U	34U	36U	38U
Aroclor-1221	NS	33U	34U	34U	36U	38U
Aroclor-1232	NS	33U	34U	34U	36U	38U
Aroclor-1242	NS	33U	34U	34U	36U	38U
Aroclor-1248	NS	540	91	34U	77P	38U
Aroclor-1254	NS	33U	34U	63P	36U	38U
Aroclor-1260	NS	33U	34U	34U	36U	38U
Total PCBs (subsurface):	10,000	540	91	63P	77P	0

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 7. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-7 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-7 6-8 11/29/99	SB-7 8-10 11/29/99	SB-7 10-12 11/29/99	SB-7 12-14 11/29/99	SB-7 14-16 11/29/99	SB-7 16-18 11/29/99	SB-7 18-20 11/29/99
Aroclor-1016	NS	33U	34U	34U	34U	34U	33U	35U
Aroclor-1221	NS	33U	34U	34U	34U	34U	33U	35U
Aroclor-1232	NS	33U	34U	34U	34U	34U	33U	35U
Aroclor-1242	NS	33U	34U	34U	34U	34U	33U	35U
Aroclor-1248	NS	160	98	37	49	200	33U	590
Aroclor-1254	NS	33U	34U	34U	34U	34U	33U	35U
Aroclor-1260	NS	33U	34U	34U	34U	34U	33U	35U
Total PCBs (subsurface):	10,000	160	98	37	49	200	0	590

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 7. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-7 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-7 20-22 11/29/99	SB-7/DL 22-24 11/29/99	SB-7/DL 24-26 11/29/99	SB-7/DL 26-28 11/29/99	SB-7/DL 28-30 11/29/99	SB-7/DL 30-32 11/29/99	SB-7/DL 32-34 11/29/99
Aroclor-1016	NS	33U	340U	34000U	340U	34000U	3500U	340U
Aroclor-1221	NS	33U	340U	34000U	340U	34000U	3500U	340U
Aroclor-1232	NS	33U	340U	34000U	340U	34000U	3500U	340U
Aroclor-1242	NS	33U	340U	34000U	340U	34000U	3500U	340U
Aroclor-1248	NS	250	2500D	770000D	4000D	650000D	94000D	4200D
Aroclor-1254	NS	33U	340U	34000U	340U	34000U	3500U	340U
Aroclor-1260	NS	33U	340U	34000U	340U	34000U	3500U	340U
Total PCBs (subsurface):	10,000	250	2500D	**770000**	4000	**650000D**	**94000D**	4200D

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 7. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-7 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-7 34-36 11/29/99	Sample Designation: / Sample Interval: / Sample Date: / Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-7 36-38 11/29/99	SB-7/DUP 36-38 11/29/99	SB-7 38-40 11/29/99	SB-7 40-42 11/29/99	SB-7 42-44 11/29/99	SB-7 44-46 11/29/99
35U	Aroclor-1016	NS	35U	35U	36U	38U	36U	36U
35U	Aroclor-1221	NS	35U	35U	36U	38U	36U	36U
35U	Aroclor-1232	NS	35U	35U	36U	38U	36U	36U
35U	Aroclor-1242	NS	35U	35U	36U	38U	36U	36U
130	Aroclor-1248	NS	130	160	77	80	280	1400
35U	Aroclor-1254	NS	35U	35U	36U	38U	36U	36U
35U	Aroclor-1260	NS	35U	35U	36U	38U	36U	36U
130	Total PCBs (subsurface):	10,000	130	160	77	80	280	1400

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 7. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-7 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-7 46-48 11/29/99	Sample Designation: Sample Interval: Sample Date: Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-7 48-50 11/29/99	SB-7 50-52 11/29/99	SB-7 52-54 11/29/99
36U	Aroclor-1016	NS	35U	35U	37U
36U	Aroclor-1221	NS	35U	35U	37U
36U	Aroclor-1232	NS	35U	35U	37U
36U	Aroclor-1242	NS	35U	35U	37U
140	Aroclor-1248	NS	220	330	140
36U	Aroclor-1254	NS	35U	35U	37U
36U	Aroclor-1260	NS	35U	35U	37U
140	Total PCBs (subsurface):	10,000	220	330	140

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 8. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-8 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-8 0-2 11/30/99	SB-8 2-4 11/30/99	SB-8 4-6 11/30/99	SB-8/DUP 4-6 11/30/99	SB-8 6-8 11/30/99	SB-8 8-10 11/30/99
Aroclor-1016	NS	33U	33U	34U	34U	34U	34U
Aroclor-1221	NS	33U	33U	34U	34U	34U	34U
Aroclor-1232	NS	33U	33U	34U	34U	34U	34U
Aroclor-1242	NS	33U	33U	34U	34U	34U	34U
Aroclor-1248	NS	64	77	130	65P	170	880
Aroclor-1254	NS	33U	33U	34U	34U	34U	34U
Aroclor-1260	NS	33U	33U	34U	34U	34U	34U
Total PCBs (subsurface):	10,000	64	77	130	65	170	880

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 8. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-8 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-8 10-12 11/30/99	SB-8 12-14 11/30/99	SB-8 14-16 11/30/99	SB-8 16-18 11/30/99	SB-8 18-20 11/30/99	SB-8 20-22 11/30/99
Aroclor-1016	NS	34U	34U	34U	34U	34U	34U
Aroclor-1221	NS	34U	34U	34U	34U	34U	34U
Aroclor-1232	NS	34U	34U	34U	34U	34U	34U
Aroclor-1242	NS	34U	34U	34U	34U	34U	34U
Aroclor-1248	NS	160	46	120	60	52P	37P
Aroclor-1254	NS	34U	34U	34U	34U	34U	34U
Aroclor-1260	NS	34U	34U	34U	34U	34U	34U
Total PCBs (subsurface):	10,000	160	46	120	60	52P	37P

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

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NS - No standard

U - This qualifier indicates compound analyzed for but not detected

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D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

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Table 8. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-8 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-8 22-24 11/30/99	SB-8 24-26 11/30/99	SB-8 26-28 11/30/99	SB-8 28-30 11/30/99	SB-8 30-32 11/30/99	SB-8 32-34 11/30/99
Aroclor-1016	NS	35U	37U	34U	35U	34U	36U
Aroclor-1221	NS	35U	37U	34U	35U	34U	36U
Aroclor-1232	NS	35U	37U	34U	35U	34U	36U
Aroclor-1242	NS	35U	37U	34U	35U	34U	36U
Aroclor-1248	NS	170	94P	92	66	90	160
Aroclor-1254	NS	35U	37U	34U	35U	34U	36U
Aroclor-1260	NS	35U	37U	34U	35U	34U	36U
Total PCBs (subsurface):	10,000	170	94P	92	66	90	160

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 8: Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-8 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-8 34-36 11/30/99	SB-8 36-38 11/30/99	SB-8 38-40 11/30/99	SB-8 40-42 11/30/99	SB-8 42-44 11/30/99	SB-8/DL 44-46 11/30/99	SB-8 30-32 11/30/99
Aroclor-1016	NS	35U	34U	36U	38U	36U	36000U	34U
Aroclor-1221	NS	35U	34U	36U	38U	36U	36000U	34U
Aroclor-1232	NS	35U	34U	36U	38U	36U	36000U	34U
Aroclor-1242	NS	35U	34U	36U	38U	36U	36000U	34U
Aroclor-1248	NS	35U	40	50	130	390	410000D	90
Aroclor-1254	NS	35U	34U	36U	38U	36U	36000U	34U
Aroclor-1260	NS	35U	34U	36U	38U	36U	36000U	34U
Total PCBs (subsurface):	10,000	0	40	50	130	390	**410000D**	90

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value.

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 8. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-8 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-8/DL 46-48 11/30/99	SB-8/DL 48-50 11/30/99	SB-8/DL 50-52 11/30/99	SB-8/DL 52-54 11/30/99
Aroclor-1016	NS	350U	340U	34000U	36000U
Aroclor-1221	NS	350U	340U	34000U	36000U
Aroclor-1232	NS	350U	340U	34000U	36000U
Aroclor-1242	NS	350U	340U	34000U	36000U
Aroclor-1248	NS	2600D	4200D	1300000D	470000D
Aroclor-1254	NS	350U	340U	34000U	36000U
Aroclor-1260	NS	350U	340U	34000U	36000U
Total PCBs (subsurface):	10,000	2600D	4200D	**1300000D**	**470000D**

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

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ft bls - Feet below land surface

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E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

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DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 9. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-9 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-9 6-8 11/30/99	SB-9 8-10 11/30/99	SB-9 10-12 11/30/99	SB-9 12-14 11/30/99	SB-9 14-16 11/30/99	SB-9/DUP 14-16 11/30/99	SB-9 16-18 11/30/99
Aroclor-1016	NS	33U	34U	34U	34U	34U	34U	34U
Aroclor-1221	NS	33U	34U	34U	34U	34U	34U	34U
Aroclor-1232	NS	33U	34U	34U	34U	34U	34U	34U
Aroclor-1242	NS	33U	34U	34U	34U	34U	34U	34U
Aroclor-1248	NS	1200	980	930	1100	680	750	350
Aroclor-1254	NS	33U	34U	34U	34U	34U	34U	34U
Aroclor-1260	NS	33U	34U	34U	34U	34U	34U	34U
Total PCBs (subsurface):	10,000	1200	980	930	1100	680	750	350

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 9. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-9 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-9 18-20 11/30/99	SB-9/DL 20-22 11/30/99	SB-9 22-24 11/30/99	SB-9/DL 24-26 11/30/99	SB-9 34-36 11/30/99	SB-9 36-38 11/30/99	SB-9 38-40 11/30/99	SB-9 40-42 11/30/99
Aroclor-1016	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Aroclor-1221	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Aroclor-1232	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Aroclor-1242	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Aroclor-1248	NS	310	5600D	1300	1100000D	560	260	100P	210
Aroclor-1254	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Aroclor-1260	NS	34U	350U	34U	34000U	36U	34U	36U	37U
Total PCBs (subsurface):	10,000	310	5600D	1300	**1100000D**	560	260	100P	210

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 9. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-9 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-9 42-44 11/30/99	SB-9 44-46 11/30/99	SB-9 46-48 11/30/99	SB-9 48-50 11/30/99	SB-9 50-52 11/30/99	SB-9 52-54 11/30/99	SB-9 54-56 11/30/99
Aroclor-1016	NS	36U	36U	34U	34U	35U	35U	37U
Aroclor-1221	NS	36U	36U	34U	34U	35U	35U	37U
Aroclor-1232	NS	36U	36U	34U	34U	35U	35U	37U
Aroclor-1242	NS	36U	36U	34U	34U	35U	35U	37U
Aroclor-1248	NS	37	89	60	150	45	240	54
Aroclor-1254	NS	36U	36U	34U	34U	35U	35U	37U
Aroclor-1260	NS	36U	36U	34U	34U	35U	35U	37U
Total PCBs (subsurface):	10,000	37	89	60	150	45	240	54

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 10. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-10 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-10/DL 0-2 12/1/99	SB-10 2-4 12/1/99	SB-10/DL 4-6 12/1/99	SB-10/DL 8-10 12/1/99	SB-10/DL 10-12 12/1/99	SB-10/DL 12-14 12/1/99	SB-10/DUP/DL 12-14 12/2/99
Aroclor-1016	NS	330U	34U	330U	340U	34U	3500U	3400U
Aroclor-1221	NS	330U	34U	330U	340U	34U	3500U	3400U
Aroclor-1232	NS	330U	34U	330U	340U	34U	3500U	3400U
Aroclor-1242	NS	330U	34U	330U	340U	34U	3500U	3400U
Aroclor-1248	NS	3000D	710	14000D	8200D	360D	61000D	43000D
Aroclor-1254	NS	330U	34U	330U	340U	34U	3500U	3400U
Aroclor-1260	NS	330U	34U	330U	340U	34U	3500U	3400U
Total PCBs (subsurface):	10,000	3000D	710	**14000D**	8200D	360D	**61000D**	**43000D**

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 10. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-10 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-10/DL 14-16 12/1/99	SB-10/DL 16-18 12/1/99	SB-10/DL 18-20 12/1/99	SB-10/DL 20-22 12/1/99	SB-10/DL 22-24 12/1/99	SB-10/DL 24-26 12/1/99	SB-10/DL 26-28 12/1/99
Aroclor-1016	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Aroclor-1221	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Aroclor-1232	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Aroclor-1242	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Aroclor-1248	NS	1600000D	2600000D	4300000D	1300000D	810000D	1100000	9700D
Aroclor-1254	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Aroclor-1260	NS	34000U	340000U	340000U	34000U	34000	36000U	350U
Total PCBs (subsurface):	10,000	**1600000D**	**2600000D**	**4300000D**	**1300000D**	**810000D**	**1100000**	9700D

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 10. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-10 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-10/DL 28-30 12/1/99	Parameter (Concentrations in µg/kg)	Sample Designation: Sample Interval: Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-10/DL 30-32 12/1/99	SB-10 32-34 12/1/99	SB-10 34-36 12/1/99	SB-10 36-38 12/1/99	SB-10/DL 38-40 12/1/99	SB-10/DL 40-42 12/2/99
360000U	Aroclor-1016	NS	350U	34U	35U	34U	35000U	360U
360000U	Aroclor-1221	NS	350U	34U	35U	34U	35000U	360U
360000U	Aroclor-1232	NS	350U	34U	35U	34U	35000U	360U
360000U	Aroclor-1242	NS	350U	34U	35U	34U	35000U	360U
4600000D	Aroclor-1248	NS	3400D	580	630	420	1100000D	8300D
360000U	Aroclor-1254	NS	350U	34U	35U	34U	35000U	360U
360000U	Aroclor-1260	NS	350U	34U	35U	34U	35000U	360U
4600000D	Total PCBs (subsurface):	10,000	3400D	580	630	420	**1100000D**	8300D

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 10. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-10 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-10/DL 42-44 12/2/99	SB-10/DL 44-46 12/2/99	Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-10 46-48 12/2/99	SB-10 48-50 12/2/99	SB-10 50-52 12/2/99	SB-10 52-54 12/2/99	SB-10 54-56 12/2/99
		Sample Designation:		**SB-10**	**SB-10**	**SB-10**	**SB-10**	**SB-10**
		Sample Interval:		**46-48**	**48-50**	**50-52**	**52-54**	**54-56**
		Sample Date:		**12/2/99**	**12/2/99**	**12/2/99**	**12/2/99**	**12/2/99**
350U	340U	Aroclor-1016	NS	34U	35U	36U	36U	36U
350U	340U	Aroclor-1221	NS	34U	35U	36U	36U	36U
350U	340U	Aroclor-1232	NS	34U	35U	36U	36U	36U
350U	340U	Aroclor-1242	NS	34U	35U	36U	36U	36U
4100D	4400D	Aroclor-1248	NS	1500	580	730	1200	550
350U	340U	Aroclor-1254	NS	34U	35U	36U	36U	36U
350U	340U	Aroclor-1260	NS	34U	35U	36U	36U	36U
4100D	4400D	Total PCBs (subsurface):	10,000	1500	580	730	1200	550

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 11. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-11 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-11 0-2 12/2/99	SB-11 2-4 12/2/99	SB-11 4-6 12/2/99	SB-11 6-8 12/2/99	SB-11 8-10 12/2/99	SB-11 10-12 12/2/99	SB-11 12-14 12/2/99
Aroclor-1016	NS	35U	34U	34U	34U	34U	34U	34U
Aroclor-1221	NS	35U	34U	34U	34U	34U	34U	34U
Aroclor-1232	NS	35U	34U	34U	34U	34U	34U	34U
Aroclor-1242	NS	35U	34U	34U	34U	34U	34U	34U
Aroclor-1248	NS	1500	200	72	320	34U	34U	64
Aroclor-1254	NS	35U	34U	34U	34U	34U	34U	34U
Aroclor-1260	NS	35U	34U	34U	34U	34U	34U	34U
Total PCBs (subsurface):	10,000	1500	200	72	320	0	0	64

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 11. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-11 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-11/DUP 12-14 12/5/99	Parameter (Concentrations in µg/kg)	Sample Designation: Sample Interval: Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-11 14-16 12/2/99	SB-11 16-18 12/2/99	SB-11 18-20 12/2/99	SB-11 20-22 12/2/99	SB-11 22-24 12/2/99	SB-11/DL 24-26 12/2/99
34U	Aroclor-1016	NS	34U	33U	33U	34U	34U	3600U
34U	Aroclor-1221	NS	34U	33U	33U	34U	34U	3600U
34U	Aroclor-1232	NS	34U	33U	33U	34U	34U	3600U
34U	Aroclor-1242	NS	34U	33U	33U	34U	34U	3600U
57	Aroclor-1248	NS	160	90	68	180	280	86000D
34U	Aroclor-1254	NS	34U	33U	33U	34U	34U	3600U
34U	Aroclor-1260	NS	34U	33U	33U	34U	34U	3600U
57	Total PCBs (subsurface):	10,000	160	90	68	180	280	**86000D**

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 11. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-11 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-11 26-28 12/2/99	SB-11 28-30 12/2/99	Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-11 30-32 12/2/99	SB-11 32-34 12/2/99	SB-11 34-36 12/2/99	SB-11 36-38 12/2/99	SB-11 38-40 12/2/99
		Sample Designation:		SB-11	SB-11	SB-11	SB-11	SB-11
		Sample Interval:		30-32	32-34	34-36	36-38	38-40
		Sample Date:		12/2/99	12/2/99	12/2/99	12/2/99	12/2/99
33U	36U	Aroclor-1016	NS	36U	35U	35U	34U	35U
33U	36U	Aroclor-1221	NS	36U	35U	35U	34U	35U
33U	36U	Aroclor-1232	NS	36U	35U	35U	34U	35U
33U	36U	Aroclor-1242	NS	36U	35U	35U	34U	35U
370	200	Aroclor-1248	NS	280	260	140	73	67
33U	36U	Aroclor-1254	NS	36U	35U	35U	34U	35U
33U	36U	Aroclor-1260	NS	36U	35U	35U	34U	35U
370	200	Total PCBs (subsurface):	10,000	280	260	140	73	67

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 11. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-11 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

SB-11 40-42 12/2/99	SB-11 42-44 12/2/99	SB-11 44-46 12/2/99	Sample Designation: / Sample Interval: / Sample Date: / Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-11 46-48 12/2/99	SB-11 48-50 12/2/99	SB-11 50-52 12/5/99	SB-11 52-54 12/5/99	SB-11 54-56 12/5/99
36U	35U	36U	Aroclor-1016	NS	35U	34U	35U	36U	37U
36U	35U	36U	Aroclor-1221	NS	35U	34U	35U	36U	37U
36U	35U	36U	Aroclor-1232	NS	35U	34U	35U	36U	37U
36U	35U	36U	Aroclor-1242	NS	35U	34U	35U	36U	37U
210	66	56	Aroclor-1248	NS	100	51	140	91	100
36U	35U	36U	Aroclor-1254	NS	35U	34U	35U	36U	37U
36U	35U	36U	Aroclor-1260	NS	35U	34U	35U	36U	37U
210	66	56	Total PCBs (subsurface):	10,000	100	51	140	91	100

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 12. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-12 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-12 0-2 12/5/99	SB-12 2-4 12/5/99	SB-12 4-6 12/5/99	SB-12 6-8 12/5/99	SB-12 8-10 12/5/99	SB-12 10-12 12/5/99	SB-12 12-14 12/5/99	SB-12 14-16 12/5/99
Aroclor-1016	NS	340U	34U	34U	33U	34U	34U	34U	34U
Aroclor-1221	NS	340U	34U	34U	33U	34U	34U	34U	34U
Aroclor-1232	NS	340U	34U	34U	33U	34U	34U	34U	34U
Aroclor-1242	NS	340U	34U	34U	33U	34U	34U	34U	34U
Aroclor-1248	NS	3500	400	770	43	230	74	47	95
Aroclor-1254	NS	340U	34U	34U	33U	34U	34U	34U	34U
Aroclor-1260	NS	340U	34U	34U	33U	34U	34U	34U	34U
Total PCBs (subsurface):	10,000	3500	400	770	43	230	74	47	95

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 12. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-12 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-12 16-18 12/5/99	SB-12 18-20 12/5/99	SB-12/DL 20-22 12/5/99	SB-12/DL 22-24 12/5/99	SB-12/DL 24-26 12/5/99	SB-12/DL 26-28 12/5/99	SB-12/DL 28-30 12/5/99	SB-12/DL 30-32 12/5/99
Aroclor-1016	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Aroclor-1221	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Aroclor-1232	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Aroclor-1242	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Aroclor-1248	NS	51P	33U	23000D	10000D	110000D	9400000D	7700000D	17000D
Aroclor-1254	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Aroclor-1260	NS	34U	33U	1700U	670U	3600U	350000U	360000U	750U
Total PCBs (subsurface):	10,000	51P	0	**23000D**	**10000D**	**110000D**	**9400000D**	**7700000D**	**17000D**

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

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DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

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P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 12. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-12 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-12/DL 32-34 12/5/99	SB-12/DL 34-36 12/5/99	SB-12 36-38 12/5/99	SB-12 38-40 12/5/99	SB-12/DL 40-42 12/5/99	SB-12 42-44 12/5/99	SB-12/DUP 42-44 12/5/99
Aroclor-1016	NS	350U	360U	35U	40U	360U	35U	35U
Aroclor-1221	NS	350U	360U	35U	40U	360U	35U	35U
Aroclor-1232	NS	350U	360U	35U	40U	360U	35U	35U
Aroclor-1242	NS	350U	360U	35U	40U	360U	35U	35U
Aroclor-1248	NS	4400D	2700D	280	740	20000D	330	390
Aroclor-1254	NS	350U	360U	35U	40U	360U	35U	35U
Aroclor-1260	NS	350U	360U	35U	40U	360U	35U	35U
Total PCBs (subsurface):	10,000	4400D	2700D	280	740	**20000D**	330	390

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 12. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-12 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	Sample Designation: / Sample Interval: / Sample Date: NYSDEC Soil Cleanup Objectives[1] (µg/kg)	SB-12 44-46 12/5/99	SB-12 46-48 12/5/99	SB-12/DL 48-50 12/5/99	SB-12 50-52 12/5/99	SB-12 52-54 12/5/99	SB-12 54-56 12/5/99
Aroclor-1016	NS	36U	35U	350U	35U	36U	38U
Aroclor-1221	NS	36U	35U	350U	35U	36U	38U
Aroclor-1232	NS	36U	35U	350U	35U	36U	38U
Aroclor-1242	NS	36U	35U	350U	35U	36U	38U
Aroclor-1248	NS	570	440	4100D	490	470	520
Aroclor-1254	NS	36U	35U	350U	35U	36U	38U
Aroclor-1260	NS	36U	35U	350U	35U	36U	38U
Total PCBs (subsurface):	10,000	570	440	4100D	490	470	520

Notes:

(1) - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 13. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-13 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

	Sample Designation:	SB-13	SB-13	SB-13	SB-13	SB-13
	Sample Interval:	44-46	46-48	48-50	50-52	52-54
	Sample Date:	4/18/00	4/18/00	4/18/00	4/18/00	4/18/00
Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)					
Aroclor-1016	NS	35U	37U	37U	36U	37U
Aroclor-1221	NS	35U	37U	37U	36U	37U
Aroclor-1232	NS	35U	37U	37U	36U	37U
Aroclor-1242	NS	35U	37U	37U	36U	37U
Aroclor-1248	NS	35U	37U	53P	83P	37U
Aroclor-1254	NS	35U	37U	37U	36U	37U
Aroclor-1260	NS	35U	37U	37U	36U	37U
Total PCBs (subsurface):	10,000	0	0	53P	83P	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 14. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-14 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

	Sample Designation:	SB-14	SB-14	SB-14	SB-14	SB-14	SB-14
	Sample Interval:	24-26	26-28	28-30	30-32	32-34	34-36
	Sample Date:	4/18/00	4/18/00	4/18/00	4/18/00	4/18/00	4/18/00
Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)						
Aroclor-1016	NS	40U	35U	34U	35U	34U	35U
Aroclor-1221	NS	40U	35U	34U	35U	34U	35U
Aroclor-1232	NS	40U	35U	34U	35U	34U	35U
Aroclor-1242	NS	40U	35U	34U	35U	34U	35U
Aroclor-1248	NS	95	63P	34U	35U	34U	35U
Aroclor-1254	NS	40U	35U	34U	35U	34U	35U
Aroclor-1260	NS	40U	35U	34U	35U	34U	35U
Total PCBs (subsurface):	10,000	95	63P	0	0	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 15. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-15 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

	Sample Designation:	SB-15	SB-15	SB-15	SB-15
	Sample Interval:	24-26	26-28	28-30	30-32
	Sample Date:	4/19/00	4/19/00	4/19/00	4/19/00
Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)				
Aroclor-1016	NS	35U	37U	35U	36U
Aroclor-1221	NS	35U	37U	35U	36U
Aroclor-1232	NS	35U	37U	35U	36U
Aroclor-1242	NS	35U	37U	35U	36U
Aroclor-1248	NS	52	43	35U	36U
Aroclor-1254	NS	35U	37U	35U	36U
Aroclor-1260	NS	35U	37U	35U	36U
Total PCBs (subsurface):	10,000	52	43	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 16. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-16 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-16 Sample Interval: 14-16 Sample Date: 4/19/00	SB-16 16-18 4/19/00	SB-16 18-20 4/19/00	SB-16 20-22 4/19/00	SB-16 22-24 4/19/00	SB-16 24-26 4/19/00	SB-16 26-28 4/19/00	SB-16 28-30 4/19/00
Aroclor-1016	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1221	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1232	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1242	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1248	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1254	NS	35U	34U	35U	34U	35U	34U	36U	34U
Aroclor-1260	NS	35U	34U	35U	34U	35U	34U	36U	34U
Total PCBs (subsurface):	10,000	0	0	0	0	0	0	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 16. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-16 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-16 Sample Interval: 30-32 Sample Date: 4/19/00	SB-16 32-34 4/19/00	SB-16 34-36 4/19/00	SB-16 36-38 4/19/00	SB-16 38-40 4/19/00	SB-16 40-42 4/19/00	SB-16 42-44 4/19/00
Aroclor-1016	NS	36U	34U	34U	34U	35U	35U	34U
Aroclor-1221	NS	36U	34U	34U	34U	35U	35U	34U
Aroclor-1232	NS	36U	34U	34U	34U	35U	35U	34U
Aroclor-1242	NS	36U	34U	34U	34U	35U	35U	34U
Aroclor-1248	NS	36U	51	34U	62	35U	35U	34U
Aroclor-1254	NS	36U	34U	34U	34U	35U	35U	34U
Aroclor-1260	NS	36U	34U	34U	34U	35U	35U	34U
Total PCBs (subsurface):	10,000	0	51	0	62	0	0	0

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives

Table 17. Summary of Polychlorinated Biphenyls Detected in Soil Boring SB-17 Plant 3 Dry Wells 20-08 and 34-07 Site Characterization Report; North Grumman Corporation, Plant 3, Bethpage, New York.

Parameter (Concentrations in µg/kg)	NYSDEC Soil Cleanup Objectives[1] (µg/kg)	Sample Designation: SB-17 Sample Interval: 24-26 Sample Date: 4/24/00	SB-17 26-28 4/24/00	SB-17 28-30 4/24/00	SB-17 30-32 4/24/00	SB-17 32-34 4/24/00
Aroclor-1016	NS	34U	34U	33U	35U	34U
Aroclor-1221	NS	34U	34U	33U	35U	34U
Aroclor-1232	NS	34U	34U	33U	35U	34U
Aroclor-1242	NS	34U	34U	33U	35U	34U
Aroclor-1248	NS	160	170	53P	35U	49P
Aroclor-1254	NS	34U	34U	33U	35U	34U
Aroclor-1260	NS	34U	34U	33U	35U	34U
Total PCBs (subsurface):	10,000	160	170	53P	0	49P

Notes:

[1] - New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs) Technical and Administrative Guidance Memorandum revised January 24, 1994.

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NS - No standard

U - This qualifier indicates compound analyzed for but not detected

J - This qualifier indicates an estimated value

B - This qualifier indicates that the analyte was found in both the sample and its associated laboratory blank

E - This qualifier indicates compounds whose concentrations exceed the calibration range of the instrument

D - This qualifier indicates all compounds identified in an analysis at a secondary dilution factor

DL - This suffix indicates a diluted sample and is appended to the sample number on the result form

DUP - This suffix indicates a duplicate sample

P - This flag is used when there is greater than 25% difference for detected concentration between the two GC columns

Bold - Data highlighted in bold represents results detected above the NYSDEC Recommended Soil Cleanup Objectives