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Appendix F

Interpretive Report for On-Site Containment System Hydraulic Effectiveness Program

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Date:
October 8, 2014

ARCADIS Project No.:
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Subject:
Interpretive Report for On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation (NYSDEC Site #1-30-003A) and Naval Weapons Industrial Reserve Plant (NYSDEC Site #1-30-003B), Bethpage, New York

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Introduction

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), ARCADIS has prepared this interpretive report for the On-Site Containment system (ONCT system) Hydraulic Effectiveness Program (Program) in operation at the Northrop Grumman facility in Bethpage, New York. The summaries provided and the associated interpretations are based on drilling, well installation, and groundwater sampling activities completed in a phased approach (Phase 1 and Phase 2), supplemented with data collected during routine groundwater monitoring rounds. The purpose of the Program is to collect additional geologic, hydrogeologic, and groundwater quality data to further support the conclusion that the ONCT system is meeting its remedial objective (on-site containment of volatile organic compound [VOC]-impacted groundwater).

The Phase 1 and Phase 2 work was performed pursuant to the ONCT System Hydraulic Effectiveness Work Plan dated December 6, 2011, which was approved by the New York State Department of Environmental Conservation (NYSDEC) in a letter, dated January 12, 2012. Phase 1 of the Program was completed in 2011 and 2012, and an interim data report for that phase was submitted to the NYSDEC on May 23, 2012. Phase 2 of the Program was completed in 2013. Vertical profile borings (VPBs) and monitoring wells were drilled and installed during both phases of the Program to collect additional geologic, hydrogeologic, and groundwater quality data. Data for Phase 2 are provided in this report. Data

for Phase 1 are also included herein for completeness and in support of the resulting data interpretations, findings, and conclusions presented in this memo.

Background

Prior to the issuance of the Operable Unit 2 (OU-2) Record of Decision (ROD) by the NYSDEC, Northrop Grumman designed, constructed, and operated the ONCT system as an Interim Remedial Measure (IRM). That IRM originally consisted of four remedial wells (Wells 1, 17, 18, and 19 - see **Figure 1**) that pumped continuously at a combined rate of approximately 3,375 gallons per minute (gpm). Later, with NYSDEC approval, Well 3 was added to the ONCT system that presently pumps at a combined rate of 3,800 gpm (equivalent to approximately 5.5 million gallons per day [MGD][1]). Water from the wells is treated by two air strippers, and treated effluent is primarily discharged to the Northrop Grumman Southern Recharge Basins, with some water also discharged to the Western Recharge Basins, supplied to the Occidental Chemical Company for use in their biosparge system, and consumed by the Calpine Energy generating facility. The remedial objective of the ONCT system is to prevent the off-site migration of VOC-impacted groundwater. Data collected during routine groundwater monitoring rounds, in accordance with the NYSDEC-approved Groundwater Monitoring Plan, indicate that the ONCT system is meeting this objective. The "Operable Unit 2 Groundwater Remedial System Hydraulic Effectiveness Evaluation" (2003) carried out jointly by Navy and Northrop Grumman, pursuant to the OU-2 ROD, provided additional data that supported the conclusion that the ONCT system is meeting its remedial objective. Northrop Grumman collected additional data under the Program (and provided in this current memo) to supplement the 2003 report and ongoing monitoring of the ONCT system.

Summary of Work Performed

This section provides a brief summary of the Phase 1 and Phase 2 work performed pursuant to the NYSDEC-approved ONCT Hydraulic Effectiveness Work Plan. VPBs and monitoring wells were drilled and installed during both phases of the Program to collect additional geologic, hydrogeologic, and groundwater quality data. **Figure 1** shows the locations of the Phase 1 and Phase 2 VPBs drilled and monitoring wells installed. The locations of the original IRM four remedial pumping wells (Wells 1, 17, 18, and 19) along with Well 3 (which was later added to the system) and Well 3R (which recently replaced Well 3), are also shown on this figure.

The Phase 1 field work (2011 through 2012) consisted of the following:

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[1] Due to age and loss of efficiency, Well 3 was replaced by Well 3R on December 13, 2013 and is presently pumping at an approximate rate of 700 gpm.

- Three VPBs (VP- 3-1, VP-33, and VP-73R) (**Figure 1**) were drilled into the Raritan Confining Unit (RCU), with VPB terminal depths as follows: VP-3-1 (766 feet below land surface [ft bls]), VP-33 (680 ft bls), and VP-73R (682 ft bls).

- Two monitoring wells (MW3-1 and GM-73D3) were installed in the boreholes of VP-3-1 and VP-73R, respectively, and developed.

- Groundwater samples were collected from the VPBs and monitoring wells for laboratory analysis for the Target Compound List (TCL) VOCs per applicable protocols as identified in the Phase 1 interim data report. Water level data were also collected from the monitoring and remedial wells coincident with routine groundwater activities.

The Phase 2 field work (2012 through 2013) consisted of the following:

- Two VPBs (VP-21 and VP-74) (**Figure 1**) were drilled into the RCU with VPB terminal depths as follows: VP-21 (872 ft bls) and VP-74 (877 ft bls).

- Four monitoring wells (GM-21D2, GM-74D3, GM-78D, and GM-78D2) were installed and developed (**Figure 1**). Two of these monitoring wells (GM-21D2 and GM-74D3) were installed in the boreholes of VP-21 and VP-74, respectively.

- Groundwater samples were collected from the VPBs and monitoring wells for laboratory analysis for the TCL VOCs per applicable protocols as identified in the Phase 2 interim data report. Water level data were also collected from the monitoring and remedial wells coincident with routine groundwater activities.

Table 1 provides the validated analytical results for groundwater samples collected from Phase 1 VPBs VP-3-1, VP-33, and VP-73R and Phase 2 VPBs VP-21 and VP-74. **Table 2** provides the validated analytical results for groundwater samples collected from Phase 1 Wells MW-3-1 and GM-73D3 and Phase 2 wells GM-74D3, GM-21D2, GM-78D, and GM-78D2. **Table 3** provides water-level data for the Phase 1 and Phase 2 monitoring wells. **Table 4** provides well construction details.

Additional data and information are provided in the enclosed attachments as follows:

- **Attachment A** provides geologic logs for VPBs and monitoring wells drilled during Phase 1 (VP-3-1, VP-33, and VP-73R) and Phase 2 (VP-74, VP-21, and GM-78D2).
- **Attachment B** provides downhole geophysical logs for VPBs and monitoring wells drilled during Phase 1 (VP-3-1, VP-33, and VP-73R) and Phase 2 (VP-74, VP-21, and GM-78D2).
- **Attachment C** provides well construction logs for all wells installed during Phase 1 (MW-3-1, GM-73D3) and Phase 2 (GM-74D3, GM-21D2, GM-78D, and GM-78D2).

Data Interpretation

Water-level data collected on July 15, 2013 from monitoring wells installed under the Program and from existing monitoring wells routinely measured as part of the 2013 annual groundwater monitoring round were mapped to assess groundwater flow patterns and to evaluate the hydraulic performance of the ONCT system. Geologic and geophysical data collected during drilling of VPBs and monitoring wells installed under the Program were evaluated to refine the hydrogeologic framework in the vicinity of the ONCT system. Similarly, groundwater quality data were mapped to evaluate the total volatile organic compound (TVOC) distribution in the aquifer during continued operation of the ONCT system.

Specifically, groundwater quality data and water-level data associated with the 2013 annual groundwater monitoring round generally conducted in the second quarter 2013 were used. For completeness, tabulated summaries of the 2013 annual round groundwater quality data (VOC analytical results) by zones differentiating shallower and deeper portions of the aquifer (i.e., Shallow, Intermediate, Deep, Deep 2, and Deep 3 Zones) are provided in **Attachment D,** and tabulated water-level data for the 2013 annual round are provided in **Attachment E.**

The following interpretive figures, in profile and plan view, were developed to support the findings and conclusions of the data interpretation:

- **Figure 2** is an interpretation of TVOCs in groundwater in the vertical plane (based on groundwater quality results from VPBs and from monitoring wells sampled during the 2013 annual groundwater monitoring round).

- **Figure 3**, which is oriented essentially perpendicular to the south/southeast regional groundwater flow direction, is an interpretation of groundwater flow (based on water levels measured on July 15, 2013) in the vertical plane during pumping of the ONCT system at an approximate rate of 3,800 gpm. **Figure3** also provides an interpretation of clay and silty-clay layers based on split-spoon sampling and geophysical logging performed in VPBs and monitoring well boreholes. For reference, **Figure 3** also displays an interpretation of TVOC concentrations in groundwater equal to 5 micrograms per liter (µg/L).

- **Figure 4** is an interpretation of TVOCs in the horizontal plane in the Deep Zone (based on groundwater quality results from VPBs and from monitoring wells sampled during the 2013 annual groundwater monitoring round).

- **Figure 5** is an interpretation of TVOCs in the horizontal plane in the Deep 2 Zone (based on groundwater quality results from VPBs and from monitoring wells sampled during the 2013 annual groundwater monitoring round).

Findings and Conclusions

The findings and conclusions developed from the data obtained from the Phase 1 and Phase 2 investigations, supplemented with routine groundwater monitoring data identified above, are summarized below:

- As shown on **Figures 2** and **3**, the basal zone of the Magothy Aquifer was identified in VP-33, VP-73R, VP-21, and VP-74 and found to range in depth from approximately 625 to 665 ft bls. This zone was identified based on the presence of granules, fine to very coarse gravels, and medium to coarse white and gray sand; beneath this basal zone, there is an abrupt transition to the underlying white, yellow, pink, or red stiff clay with high plasticity of the RCU.

- As shown on **Figures 2** and **3**, clay indicative of the RCU was identified in VP-33, VP-73R, VP-74, and VP-21 at approximately 650 to 695 ft bls. Below these depths within the RCU, layers of varying thickness of clay and sand (with sand interbedded with layers of fine sand, silt and clay) were penetrated.

- As shown on **Figures 2** and **3**, groundwater with TVOCs at concentrations greater than 5 µg/L is not found in the shallower portion of the aquifer from the water table to approximately 300 ft bls. Groundwater containing concentrations of TVOCs greater than 5 µg/L occurs only in deeper horizons at depths ranging from below 300 ft bls to approximately 650 ft bls. All sample locations in the basal Magothy Aquifer yielded VOC concentrations below Standards, Criteria, and Guidelines (SCGs). Groundwater containing TVOCs at concentrations greater than 5 µg/L was not found below the top of the RCU during the Phase 1 and Phase 2 investigations, nor did VOC concentrations exceed SCGs below the top of the RCU.

- **Figure 3** shows an interpretation of water-level elevations and directions of groundwater flow in the vertical plane. Overall, the depicted groundwater flow patterns indicate that groundwater is moving vertically down from the water table and up from the basal Magothy Aquifer toward the screen zones of Remedial Wells 17, 18, and 19. Groundwater is also moving laterally toward these wells.

- **Figures 2** and **3** collectively indicate that groundwater containing TVOCs at or greater than 5 µg/L is within the capture zone of the ONCT system, and groundwater impacted with VOCs is being drawn toward the well screens of Remedial Wells 17, 18 and 19 and removed from the aquifer by pumping these wells.

- As shown on **Figures 4** and **5**, the impact of continued pumping of the ONCT system over time on the distribution of TVOCs in groundwater is evident as follows:

- In the Deep zone portion of the aquifer (**Figure 4**), bifurcation of the TVOC-impacted groundwater is shown: in the immediate area of the ONCT system remedial wells/Northrop Grumman site southern boundary, TVOC concentrations less than 5 µg/L occur, and this area separates upgradient TVOCs greater than 5 µg/L from TVOC concentrations greater than 5 µg/L further downgradient.

- In the Deep 2 zone portion of the aquifer (**Figure 5**), bifurcation of the TVOC-impacted groundwater is also shown: in the immediate area of the ONCT system remedial wells/Northrop Grumman site southern boundary, TVOC concentrations less than 50 µg/L occur, and this area separates upgradient TVOC concentrations greater than 50 µg/L from TVOCs greater than 50 µg/L further downgradient.

- **Figures 4** and **5** collectively indicate that, as ONCT pumping continues over time, bifurcation of TVOC-impacted groundwater will continue to develop and, as a result, a "clean water" front will form downgradient of the ONCT system as on-site containment is maintained. VOC-impacted groundwater continues to be removed from the aquifer by pumping these wells, and recharge of treated water to the Southern Recharge Basins continues.

In summary, evaluation of the data collected during Phases 1 and 2 of the ONCT System Hydraulic Effectiveness Program further confirms that the ONCT system provides effective vertical and horizontal hydraulic control of groundwater containing TVOC concentrations of 5 µg/L or greater and is preventing its off-site migration. Therefore, the ONCT system is satisfying its remedial action objective.

Enclosures:

Tables

Table 1. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Monitoring Wells, On-Site Containment System, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Table 3. Water Level Measurement Data for Monitoring Wells, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Table 4. Construction Details for Monitoring Wells, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Figures

Figure 1. Site Plan Showing Monitoring Wells and Vertical Profile Borings
Figure 2. Cross-section E-E' TVOCs in Groundwater (Modified March 2014)
Figure 3. Cross-section E-E' Directions of Vertical Groundwater Flow (Modified March 2014)
Figure 4. Total Volatile Organic Compound Concentrations in Deep Wells, May-June 2013
Figure 5. Total Volatile Organic Compound Concentrations in Deep 2 Wells, May-June 2013

Attachments

Attachment A. Geologic Logs
Attachment B. Geophysical Logs
Attachment C. Well Construction Logs
Attachment D Supplemental Groundwater Quality Data from Second Quarter 2013
Attachment E Supplemental Water Level Data from Second Quarter 2013

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Tables

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1
Sample Date	1/20/2012	1/23/2012	1/23/2012	1/24/2012	1/25/2012	1/25/2012	1/25/2012	1/25/2012	1/26/2012	1/30/2012
Sampling Depth or Interval (ft bls):	100	150	200	258	300	320	340	360	389	429
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.36 J**
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	**0.3 J**	**0.46 J**	**0.58 J**	< 5	**0.78 J**
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	**0.28 J**	**0.33 J**	**0.32 J**	**0.21 J**	**0.9 J**
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**31 J**	< 50 B	< 50 B	< 50 B	< 50 B	< 50	< 50 B	< 50 B	< 50 B	**3.9 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	**1.4 J**	< 5	**0.72 J**	< 5	**0.34 J**	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.22 J**
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	**0.43 J**	**0.44 J**	**0.83 J**	**0.26 J**	**1.9 J**
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	**0.43 J**	< 5	**0.2 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	**0.28 J**	**1.4 J**	**0.82 J**	**1.4 J**	**1.6 J**	**13**
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	< 5	< 5	< 5	**0.64 J**	**4.1 J**	**16**	**13**	**27**	**4.9 J**	**11**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	**0.67 J**	**0.59 J**	**2.3 J**	**1 J**	**2.3 J**	**0.26 J**	**2.8 J**
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	**0.32 J**
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**33**	0	**0.92**	**1.3**	**5.3**	**21**	**16**	**32**	**7.2**	**35**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-03-1
Sample Date	1/30/2012	1/30/2012	1/31/2012	2/1/2012	2/2/2012	2/6/2012	2/7/2012	2/10/2012	2/13/2012	3/14/2012
Sampling Depth or Interval (ft bls):	439	449	464	489	509	531	548	559	581	609-619[1]
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	**1.2 J**	< 5	**0.4 J**	**0.81 J**	**0.37 J**	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	**2.2 J**	< 5	**0.42 J**	**1.5 J**	**1.1 J**	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	**6.9**	< 5	**1.1 J**	**1.7 J**	**1 J**	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**3.4 J**	**4.6 J**	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50
Benzene	**0.61 J**	< 0.7 J	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	**0.66 J**	< 5 J	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	**0.49 J**	< 5	< 5	< 5	**0.85 J**	**0.58 J**	**0.98 J**	**0.69 J**	**0.75 J**
Chloroethane	**4.5 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	**0.24 J**	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	**13**	< 5	**2 J**	**22**	**13**	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	**150**	**1.3 J**	**17**	**140**	**33**	< 5	< 5	< 5	< 5	< 5
Toluene	< 5	< 5 J	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**240 D**	**0.83 J**	**26**	**320 D**	**160**	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	**6.2**	**46**	**1.7 J**	**0.29 J**	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	**170**	< 2	**0.43 J**	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	**0.6 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**600**	**53**	**49**	**490**	**210**	**0.85**	**0.58**	**0.98**	**0.69**	**0.75**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-03-1	VP-03-1	VP-03-1	VP-03-1	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33
Sample Date	3/12/2012	3/12/2012	3/9/2012	3/7/2012	2/14/2012	2/15/2012	2/15/2012	2/16/2012	2/16/2012	2/20/2012
Sampling Depth or Interval (ft bls):	644-649[1]	650-660[1]	689-699[1]	729-739[1]	60	110	160	210	260	320
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50	< 50	< 50	< 50	< 50	< 50 B	< 50 B	< 50	< 50 B	**6.2 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	**0.25 J**	**0.26 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	**0.29**	**0.27**	**0.26**	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5 B
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	< 5	< 5	< 5	< 5	< 5	**0.40 J**	**0.50 J**	**5.7**	**0.37 J**	**6.6**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.22**	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**0.25**	**0.26**	0	0	**0.29**	**0.67**	**0.76**	**5.92**	**0.37**	**13**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33
Sample Date	2/21/2012	2/21/2012	2/22/2012	2/22/2012	2/23/2012	2/23/2012	2/24/2012	2/24/2012	2/24/2012	2/27/2012
Sampling Depth or Interval (ft bls):	360	400	425	440	460	485	490	500	505	515
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	**0.32 J**	< 5	**0.35 J**	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	**2.7 J**	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**5.8 J**	**4.5 J**	< 50 B	< 50 B	**5.4 J**	**17 J**	**1.9 J**	**13 J**	**11 J**	**4.8 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	**0.24 J**	< 5	< 5	**0.21 J**	**0.26 J**
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	**0.23 J**	< 5	< 5	**3 J**	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	**0.23 J**	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	**0.53 J**	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5 B	< 5 B	< 5 B	**1.3 J**	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	**0.28 J**	**0.33 J**	< 5	**0.43 J**	**0.87 J**	< 5	**0.37 J**	**1.2 J**
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**0.48 J**	**2.1 J**	**3.2 J**	**8.1**	**5.6**	**4 J**	**14**	**1.2 J**	**2.2 J**	**12**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	**0.28 J**	< 5	**0.29 J**	**1.1 J**
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**6.3**	**7.2**	**3.5**	**8.8**	**15**	**24**	**18**	**14**	**14**	**19**

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Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-33	VP-73R	VP-73R	VP-73R
Sample Date	2/28/2012	3/28/2012	2/29/2012	3/2/2012	3/5/2012	3/26/2012	3/12/2012	12/29/2011	12/30/2011	12/30/2011
Sampling Depth or Interval (ft bls):	535	560 - 570[1]	565	608	628	643 - 653[1]	648	406	426	446
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
1,1-Dichloroethane	**0.32 J**	**0.23 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.5 J**
1,1-Dichloroethene	**0.58 J**	**0.46 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.5 J**
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 100
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 100
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 100
Acetone	**19 J**	< 50	< 50 B	**4.9 J**	**12 J**	< 50	**16 J**	< 50 B	< 50 B	< 100 B
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 1.4
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Chlorodifluoromethane (Freon 22)	< 5	**0.26 J**	< 5	< 5	< 5	**0.22 J**	< 5	< 5	< 5	< 10
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Chloroform	**0.33 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Chloromethane	< 5	< 5	< 5	< 5	**0.32 J**	< 5	< 5	< 5	< 5	< 10
cis-1,2-dichloroethene	**1.5 J**	**0.81 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.58 J**
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	**0.27 J**	< 5	< 5	< 10
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Tetrachloroethene	**6.4**	**12**	**0.26 J**	< 5	< 5	< 5	< 5	**0.29 J**	< 5	**1.4 J**
Toluene	< 5	< 5	< 5 B	< 5	< 5	< 5 B	< 5 B	< 5	< 5	< 10
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Trichloroethylene	**530 D**	**19**	**4.2 J**	< 5	**1.2 J**	< 5	**0.61 J**	**45**	**15**	**260**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Trichlorotrifluoroethane (Freon 113)	**4.8 J**	**3.6 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 4
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10
TVOCs	**560**	**36**	**4.5**	**4.9**	**14**	**0.22**	**17**	**45**	**15**	**260**

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Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-73R	VP-73R	VP-73R	VP-73R	VP-73R	VP-73R	VP-73R	VP-73R	VP-73R	VP-74
Sample Date	1/3/2012	1/4/2012	1/5/2012	1/5/2012	1/6/2012	1/9/2012	1/9/2012	1/10/2012	1/10/2012	10/23/2012
Sampling Depth or Interval (ft bls):	466	481	501	526	541	571	581	601	621	52
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	**0.28 J**	**0.32 J**	< 5	**0.23 J**	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	**0.26 J**	< 5	< 5	**0.83 J**	**0.47 J**	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	**0.43 J**	**1.3 J**	**0.25 J**	**0.81 J**	**0.61 J**	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50 B	< 50 B	< 50 B	< 50 B	**2.8 J**	**7.7 J**	**3.4 J**	< 50 B	< 50 B	**11 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.6 J**
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	**0.23 J**	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	**0.42 J**	< 5	**0.4 J**	**0.71 J**	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	**0.23 J**	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	**0.2 J**	< 5	< 5	< 5	**0.72 J**	< 5	**0.33 J**	**0.24 J**	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	**0.21 J**	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	**0.36 J**	**0.21 J**	**0.25 J**	**0.61 J**	**3.5 J**	**5.8**	**16**	**9.3**	**1.7 J**	< 5
Toluene	< 5 B	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**110 J**	**30**	**22**	**25**	**51**	**6.9**	**11**	**8.5**	**1.8 J**	< 5
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	**0.45 J**	< 5	**0.24 J**	**0.3 J**	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	**0.61 J**	**0.34 J**	**1.7 J**	**1.1 J**	**0.26 J**	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**110**	**30**	**22**	**27**	**62**	**21**	**34**	**21**	**3.8**	**12**

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Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74
Sample Date	10/24/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/7/2012	11/7/2012	11/7/2012	11/8/2012	11/8/2012
Sampling Depth or Interval (ft bls):	96	157	186	203	223	243	266	291	303	323
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50 B	**10 J**	**8 J**	**6 J**	**7.6 J**	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	**0.24 J**	< 5	< 5	< 5	< 5	**0.2 J**	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	**0.31 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	**0.2 J**	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	**0.22 J**	< 5	**0.24 J**	< 5	< 5
Toluene	**0.26 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**0.31 J**	< 5	< 5	< 5	< 5	**3.7 J**	**0.32 J**	**2.9 J**	**0.32 J**	**0.27 J**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**0.57**	**11**	**8.0**	**6**	**7.6**	**3.9**	**0.72**	**3.1**	**0.32**	**0.27**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74
Sample Date	11/9/2012	11/12/2012	11/12/2012	11/12/2012	11/13/2012	11/13/2012	11/13/2012	11/14/2012	11/14/2012	11/15/2012
Sampling Depth or Interval (ft bls):	368	388	413	433	456	473	493	513	533	563
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	**0.24 J**	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	**0.23 J**	< 5	< 5	< 5	**0.21 J**
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	**0.34 J**	< 5	< 5	< 5	**0.37 J**
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	**1.1 J**	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50 B	**12 J**	**6.1 J**	**15 J**	**14 J**	**7 J**	**12 J**	**13 J**	**15 J**	**5.7 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	0.3 J	< 5	< 5	**0.21 J**	< 5	< 5	< 5	< 5	**0.23 J**
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	**0.48 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.31 J**
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	**0.21 J**	**0.26 J**	< 5	**0.24 J**	**0.25 J**	**0.2 J**	**0.28 J**
Chloromethane	< 5	< 5	< 5	**0.22 J**	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	**0.47 J**	< 5	< 5	**0.86 J**	< 5	< 5	< 5	**1.8 J**
Toluene	< 5	**0.22 J**	**0.27 J**	**0.58 J**	< 5 B	< 5	< 5 B	**0.21 J**	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**0.51 J**	**2 J**	**3.5 J**	< 5	**0.42 J**	**2.9 J**	**0.43 J**	< 5	< 5	**3.6 J**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.22 J**
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.45 J**
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**0.99**	**15**	**10**	**17**	**15**	**12**	**13**	**13**	**15**	**13**

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Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74
Sample Date	11/15/2012	11/20/2012	11/20/2012	11/20/2012	11/27/2012	11/27/2012	11/28/2012	11/28/2012	11/28/2012	11/28/2012
Sampling Depth or Interval (ft bls):	583	603	608	613	692	702	717	727	742	752
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	**0.55 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	2.3 J	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**8.6 J**	**23 J**	**13 J**	**3.6 J**	**6.4 J**	**9.5 J**	**4.7 J**	**17 J**	**1.9 J**	**11 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	**0.21 J**	< 5	< 5	< 5	**0.23 J**	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	**0.37 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	**0.3 J**	**0.29 J**	**0.26 J**	< 5	< 5	**0.32 J**	< 5	**0.21 J**	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.29 J**
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	**4.6 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	**0.21 J**	**0.21 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**4.9 J**	< 5	< 5	**0.37 J**	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane (CFC-11)	**0.25 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	**0.66 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**20**	**24**	**13**	**4.0**	**6.4**	**10**	**4.7**	**20**	**1.9**	**11**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-74	VP-74	VP-74	VP-74	VP-74	VP-74	VP-21	VP-21	VP-21	VP-21
Sample Date	11/29/2012	11/29/2012	12/3/2012	12/3/2012	12/4/2012	12/4/2012	1/28/2013	1/29/2013	1/29/2013	1/30/2013
Sampling Depth or Interval (ft bls):	767	782	792	800	817	837	442	462	482	517
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.35 J**
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.61 J**
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.78 J**
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**12 J**	**16 J**	**9.3 J**	**4.9 J**	**3.1 J**	**4.4 J**	**6.7 J**	**9.8 J**	**9.2 J**	**5.9 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	**0.27 J**	**0.28 J**	< 5	< 5	< 5	**0.32 J**	**0.32 J**	**0.2 J**
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	**0.26 J**	< 5	**0.31 J**	**0.25 J**	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.6 J**	**0.43 J**	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.63 J**
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**1.1 J**
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	< 5	< 5	< 5	< 5	< 5	< 5	**0.53 J**	< 5	< 5	**42**
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**12**	**16**	**9.9**	**5.4**	**3.1**	**4.4**	**7.2**	**11**	**10**	**51**

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Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21
Sample Date	1/31/2013	1/31/2013	2/1/2013	2/4/2013	2/5/2013	2/5/2013	2/5/2013	2/5/2013	2/6/2013	2/6/2013
Sampling Depth or Interval (ft bls):	542	554	567	582	602	622	632	637	642	652
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**5.7 J**	**6.5 J**	**4.9 J**	**7.2 J**	**4.6 J**	**8.1 J**	**5.2 J**	**8.9 J**	**11 J**	**14 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	**0.37 J**	**0.37 J**	**0.24 J**	**0.21 J**	< 5	**0.21 J**	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	**0.34 J**	**0.35 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	**0.57 J**	< 5	**0.29 J**	< 5	< 5
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	**0.59 J**	**0.69 J**	**0.35 J**	< 5	< 5	**0.79 J**	< 5	**0.48 J**	< 5	< 5
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**7**	**8.0**	**5.0**	**7.4**	**4.6**	**10**	**5.2**	**9.7**	**11**	**14**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21	VP-21
Sample Date	2/6/2013	2/7/2013	2/12/2013	2/13/2013	2/13/2013	2/14/2013	2/14/2013	2/14/2013	2/17/2013	2/17/2013
Sampling Depth or Interval (ft bls):	657	662	702	716	732	742	752	762	802	812
Constituent Name (units in ug/L)										
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	**2.2 J**	**2.9 J**	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	**13 J**	**15 J**	**11 J**	**15 J**	**21 J**	**14 J**	**12 J**	**12 J**	**13 J**	**7 J**
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.22 J**	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	**0.24 J**	**0.28 J**	**0.27 J**	**0.24 J**	< 5	**0.22 J**	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.26 J**	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 5	< 5 B	< 5	< 5 B	< 5	< 5	< 5	< 5	**0.34 J**	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	< 5	**0.27 J**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**13**	**15**	**11**	**17**	**24**	**14**	**12**	**12**	**14**	**7**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID	VP-21	VP-21	VP-21
Sample Date	2/17/2013	2/19/2013	2/19/2013
Sampling Depth or Interval (ft bls):	822	842	852
Constituent Name (units in ug/L)			
1,1,1-Trichloroethane	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5
1,1-Dichloroethane	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50
4-methyl-2-pentanone	< 50	< 50	< 50
Acetone	**12 J**	**5 J**	**13 J**
Benzene	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5
Carbon Disulfide	**0.24 J**	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5
Chloroform	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5
cis-1,2-dichloroethene	< 5	< 5	< 5
cis-1,3-dichloropropene	< 5	< 5	< 5
Dibromochloromethane	**0.24 J**	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5
Styrene	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5
Toluene	**0.33 J**	< 5	< 5
trans-1,2-dichloroethene	< 5	< 5	< 5
trans-1,3-dichloropropene	< 5	< 5	< 5
Trichloroethylene	< 5	< 5	< 5
Trichlorofluoromethane (CFC-11)	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2
Xylene-o	< 5	< 5	< 5
Xylenes - m,p	< 5	< 5	< 5
TVOCs	**13**	**5**	**13**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Borings, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Notes and Abbreviations:

All samples collected with Hydropunch unless otherwise indicated.

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2000 Method OLM4.3.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
TCL	Target Compound List
VOC	Volatile Organic Compound
TVOC	Total Volatile Organic Compounds
ASP	Analytical Services Protocol
ug/L	Micrograms per liter
ft bls	feet below land surface
J	Value is estimated
B	Compound detected in associated blank sample
D	Secondary dilution
(1)	Pumped Sample collected using temporary well screen from interval indicated.

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Table 2. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Location ID:	GM-73D3	MW-3-1	GM-74D3	GM-21D2	GM-78D	GM-78D2
Sample Date:	2/21/2012	3/28/2012	6/26/2013	3/11/2013	4/26/2013	4/12/2013
Constituent Name (units in ug/L)						
1,1,1-Trichloroethane	< 10	< 50	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 10	< 50	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 10	< 50	< 5	< 5	< 5	< 5
1,1-Dichloroethane	< 10	< 50	< 5	**0.21 J**	**0.30 J**	< 5
1,1-Dichloroethene	< 10	**2.6 J**	**0.31 J**	**0.3 J**	< 5	< 5
1,2-Dichloroethane	< 10	< 50	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 10	< 50	< 5	< 5	< 5	< 5
2-Butanone	< 10	< 500	< 50	< 50	< 50	< 50
2-Hexanone	< 10	< 500	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	< 10	< 500	< 50	< 50	< 50	< 50
Acetone	< 10	< 500	< 50	< 50	< 50	< 50
Benzene	< 10	< 7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 10	< 50	< 5	< 5	< 5	< 5
Bromoform	< 10	< 50	< 5	< 5	< 5	< 5
Bromomethane	< 10	< 50	< 5	< 5	< 5	< 5
Carbon Disulfide	< 10	< 50	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 10	< 50	< 5	< 5	< 5	< 5
Chlorobenzene	< 10	**2.1 J**	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 10	< 50	< 5	< 5	< 5	< 5
Chloroethane	< 10	**40 J**	< 5	< 5	< 5	< 5
Chloroform	< 10	< 50	< 5	< 5	**0.31 J**	< 5
Chloromethane	< 10	< 50	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	< 10	**31 J**	**0.30 J**	**0.27 J**	**0.60 J**	< 5
cis-1,3-dichloropropene	< 10	< 50	< 5	< 5	< 5	< 5
Dibromochloromethane	< 10	< 50	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 10	< 50	< 5	< 5	< 5	< 5
Ethylbenzene	< 10	< 50	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	< 10	< 50	< 5	< 5	< 5	< 5
Methylene Chloride	< 10	< 50	< 5	< 5	< 5	< 5
Styrene	< 10	< 50	< 5	< 5	< 5	< 5
Tetrachloroethene	< 10	**56**	**1.4 J**	**0.77 J**	**0.27 J**	**0.20 J**
Toluene	< 10	**8.7 J**	**0.29 J**	< 5	< 5	< 5
trans-1,2-dichloroethene	< 10	< 50	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	< 10	< 50	< 5	< 5	< 5	< 5
Trichloroethylene	< 10	**220**	**3.0 J**	**18**	**3.3 J**	**1.1 J**
Trichlorofluoromethane (CFC-11)	< 10	< 50	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 10	< 50	**0.44 J**	< 5	< 5	< 5
Vinyl Chloride	< 10	**1300**	< 2	< 2	< 2	< 2
Xylene-o	< 10	< 50	< 5	< 5	< 5	< 5
Xylenes - m,p	< 10	< 50	< 5	< 5	< 5	< 5
TVOCs	0	**1700**	**5.7**	**20**	**4.8**	**1.3**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2000 Method OLM4.3.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC New York State Department of Environmental Conservation
TCL Target Compound List
VOC Volatile Organic Compound
TVOCs Total Volatile Organic Compounds
ASP Analytical Services Protocol
ug/L Micrograms per liter
J Value is estimated

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Table 3. Water Level Measurement Data for Monitoring Wells, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Deep Wells			
GM-78D[1]	105.04	44.16	60.88
Deep2 Wells			
MW-3-1 [2]	104	49.98	54.02
GM-21D2[1]	105.88	46.95	58.93
GM-78D2[1]	105.05	44.20	60.85
Deep3 Wells			
GM-73D3	104.64	44.89	59.75
GM-74D3	107.58	47.92	59.66

Notes

(1) Water level measurement was taken during the well development process which was a separate event for each of these wells. These wells were not included in the water level measurement round (July 15, 2013) of the other wells included in this table.

(2) Surveyed elevation not available, elevation is estimated from topographic maps of the area.

ft msl feet relative to mean sea level

ft bmp feet below measuring point

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Table 4: Construction Details for Monitoring Wells, On-Site Containment System Hydraulic Effectiveness Program, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Land Elevation (ft msl)	Measuring Point Elevation (ft msl)	Monitoring Well Screened Interval (ft bls)	Monitoring Well Screened Interval (ft msl)	Total Depth (ft bls)	Total Depth (ft msl)	Installation Date
GM-21D2	105.99	105.88	516 - 526	-410.0 - -420.0	531.0	-425.0	2/27/2013
GM-78D	105.40	105.04	354 - 364	-248.6 - -258.6	369.0	-263.6	4/18/2013
GM-78D2	105.40	105.05	459 - 479	-353.6 - -373.6	484.0	-378.6	4/4/2013
MW 3-1	104	104 (1)	476 - 496	-372.0 - -392.0	501.0	-397.0	3/22/2012
GM-73D3	105.3	104.64	635 - 650	-529.7 - -544.7	655.0	-549.7	1/20/2012
GM-74D3	104 (2)	107.58	625 - 645	-521.0 - -541.0	650.0	-546.0	12/13/2012

Notes and Abbreviations:
bls: below land surface
msl: mean sea level
(1): Survey data is estimated from topographic maps of the area.
(2): Land elevations estimated from topographic maps.

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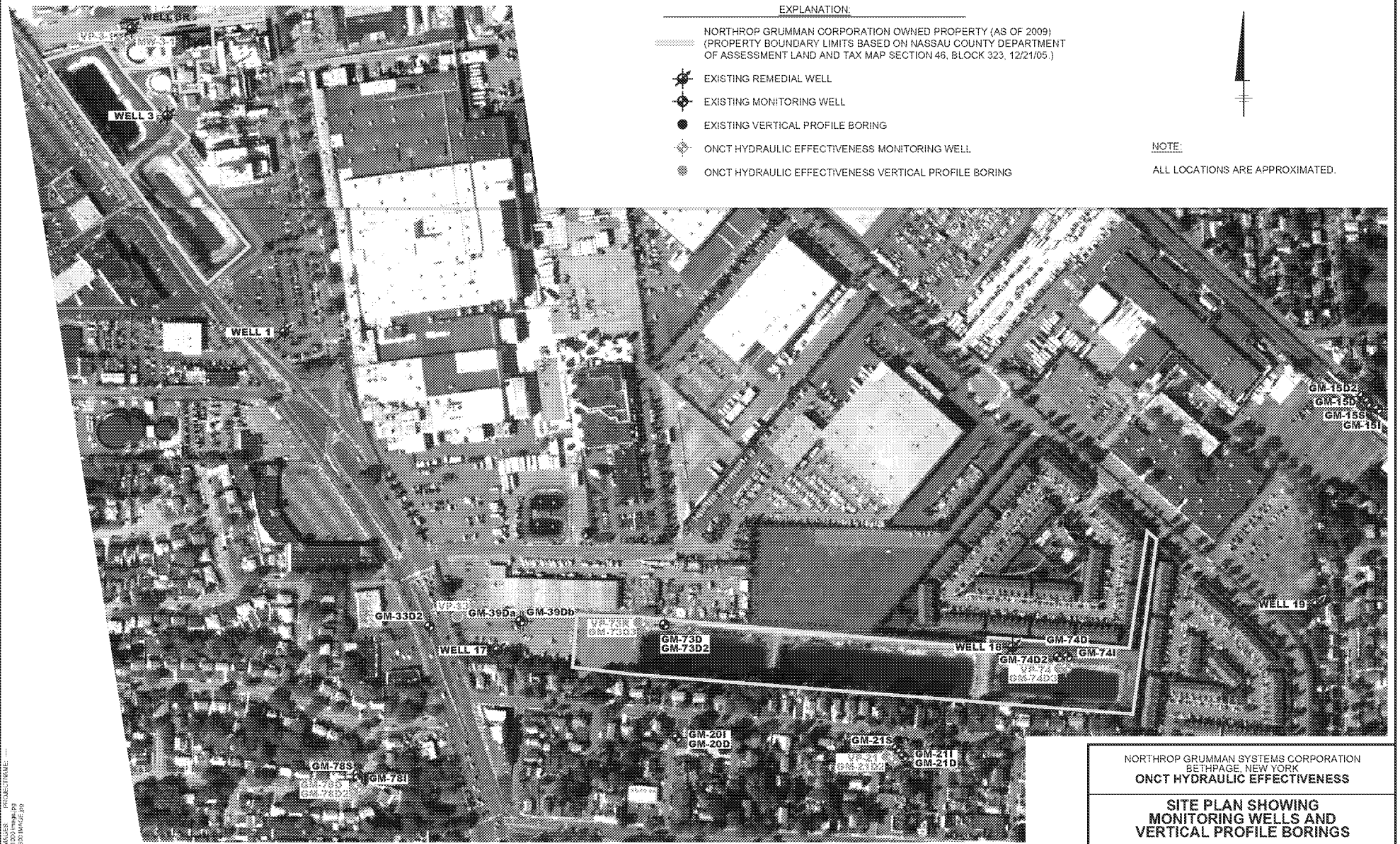
Figures



NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
ONCT HYDRAULIC EFFECTIVENESS

SITE PLAN SHOWING MONITORING WELLS AND VERTICAL PROFILE BORINGS

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FIGURE
1

ED_002631A_00010556-00028

E' EAST

NORTHROP GRUMMAN SITE

SOUTH RECHARGE BASINS

SECTION BEND TO SOUTHWEST

SECTION BEND TO NORTH/NORTHEAST

GM-78S GM-78I GM-78D GM-78D2

GM-33D2

ONCT REMEDIAL WELL 17

VP-33

VP-39 GM-39DA GM-39DB

VP-73R GM-73D GM-73D2 GM-73D3

GM-20I GM-20D (PROJECTED NORTH 385 FT)

VP-21 GM-21S GM-21I GM-21D GM-21D2 (PROJECTED NORTH 385 FT)

ONCT REMEDIAL WELL 18

VP-74 GM-74I GM-74D GM-74D2 GM-74D3

ONCT REMEDIAL WELL 19

GM-15S GM-15I GM-15D GM-15D2

LAND SURFACE

UPPER GLACIAL AQUIFER

MAGOTHY AQUIFER

WELL 17

WELL 18

WELL 19

TOP OF RARITAN CONFINING UNIT

RARITAN CONFINING UNIT (*)

RARITAN CONFINING UNIT

ELEVATION (FT. MSL.)

DISTANCE ALONG TRANSECT (FEET)

EXPLANATION:

RECHARGE BASIN (TYPICAL; NOT TO SCALE)

UNSATURATED ZONE

APPROXIMATE GROUNDWATER TABLE

UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSISTS OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT AND AT SOME LOCATIONS AND/OR HORIZONS INTERBEDDED LAYERS OF FINE SAND, SILT AND CLAY.

CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) WITHIN MAGOTHY AND UPPER GLACIAL AQUIFERS

BASAL MAGOTHY: GRANULES, FINE TO VERY COARSE GRAVELS, AND MEDIUM TO COARSE SAND, WHITE AND GRAY

CLAY, GRAY, WHITE, YELLOW, PINK OR RED, STIFF WITH HIGH PLASTICITY

WELL 17

VERTICAL PROFILE BORING — VP-73R

GM-33D2 - WELL ID

LAND SURFACE

END OF BORING

4.46 TVOC CONCENTRATION FROM VPB DATA

24.35 TVOC CONCENTRATION FROM VPB TEMPORARY WELL

TEMPORARY WELL SCREEN

MONITORING WELL SCREENED INTERVAL

TVOC CONCENTRATION

REMEDIAL WELL SCREENED INTERVAL

REMEDIAL WELL BLANK INTERVAL

END OF BORING

VPB - VERTICAL PROFILE BORING

FT MSL - FEET RELATIVE TO MEAN SEA LEVEL

TVOC - TOTAL VOLATILE ORGANIC COMPOUND

* BORING SPECIFIC INFORMATION IS NOT AVAILABLE FOR THE RARITAN CONFINING UNIT IN THESE HORIZONS

DEFINITION OF TVOC CONTOURS (DASHED WHERE LESS CONTROL)

5 — 5 Micrograms per liter (µg/L)

50 — 50 µg/L

100 — 100 µg/L

VERTICAL EXAGERATION = 2.5X

NOTES:

1. HORIZONTAL COMPONENT OF REGIONAL GROUNDWATER FLOW DIRECTION IS TO SOUTH/SOUTHEAST.
2. GRAY SHADED AREAS ON LINE OF SECTION KEY MAP REPRESENT NORTHROP GRUMMAN OWNED PROPERTY.
3. VPBs VP-21 AND VP-74 ALONG WITH MWs GM-21D2, GM-78D, GM-78D2 AND GM-74D3 WERE DRILLED AS PART OF THE PHASE 2 HYDRAULIC EFFECTIVENESS EVALUATION BETWEEN JANUARY 2012 AND MARCH 2013.
4. MONITORING WELL TVOC DATA FROM THE 2013 COMPREHENSIVE SAMPLING ROUND (MAY - JUNE, 2013) RESULTS REPRESENTATIVE OF ENTIRE WELL SCREEN INTERVAL.
5. MONITORING WELL TVOC CONCENTRATION FOR MW GM21-D2, GM-78 AND GM-78D2 ARE FROM GROUNDWATER SAMPLES TAKEN AT THE END OF WELL DEVELOPMENT IN MARCH AND APRIL 2013.
6. ONCT REMEDIAL WELLS 17, 18 AND 19 PUMP AT APPROXIMATELY 1,000 GPM, 800 GPM AND 700 GPM, RESPECTIVELY. SOUTH RECHARGE BASINS RECEIVE APPROXIMATELY 2,200 GPM OF TREATED GROUNDWATER FROM ONCT SYSTEM.

FORMER OCC/RUCO PROPERTY

FORMER NWARP PROPERTY

FORMER NORTHROP GRUMMAN PROPERTY

LOCATION OF LINE OF SECTION

SCALE: 1"=2000'

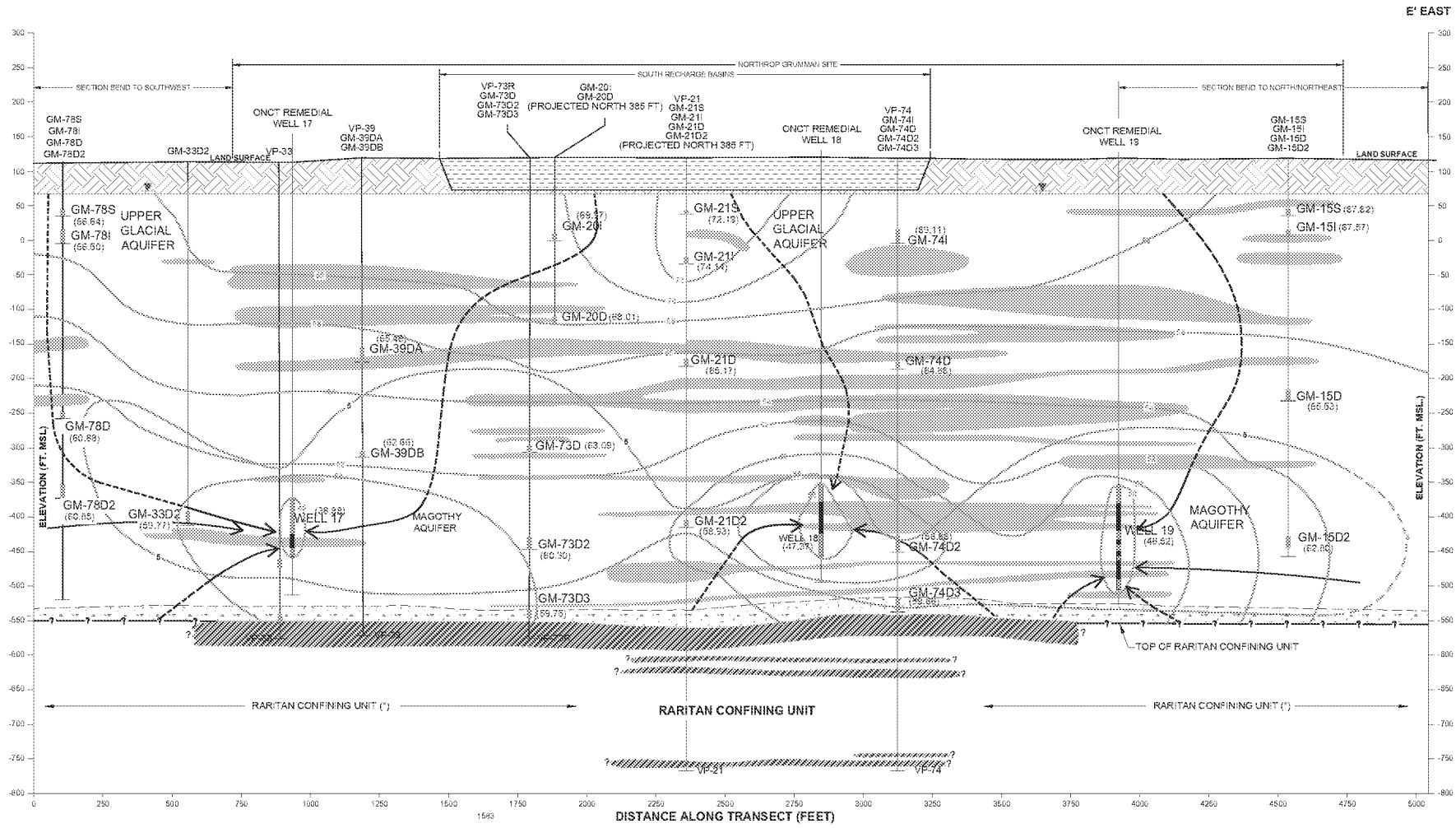
ONCT HYDRAULIC EFFECTIVENESS PROGRAM
NORTHROP GRUMMAN SYSTEMS CORPORATION
OPERABLE UNIT 2
BETHPAGE, NEW YORK

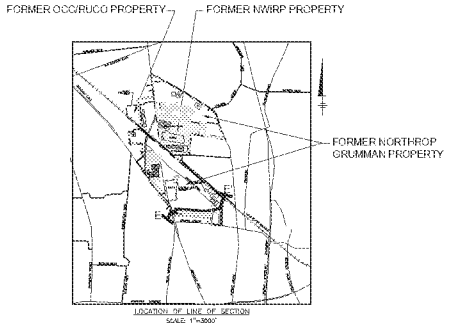
CROSS-SECTION E-E'
TVOCs IN GROUNDWATER
(MODIFIED MARCH 2014)

ARCADIS

FIGURE 2

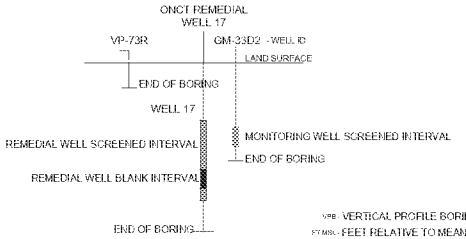
ED_002631A_00010556-00029





EXPLANATION:

- RECHARGE BASIN (TYPICAL; NOT TO SCALE)
- UNSATURATED ZONE
- APPROXIMATE GROUNDWATER TABLE
- UNSHADED AREAS REPRESENT SATURATED AQUIFER MATERIAL WHICH CONSISTS OF SAND WITH VARYING AMOUNTS OF GRAVEL AND SILT AND AT SOME LOCATIONS AND/OR HORIZONS INTERBEDDED LAYERS OF FINE SAND, SILT AND CLAY.
- CLAYEY SAND, SANDY CLAY, AND CLAY (CONFINING UNITS) WITHIN MAGOTHY AND UPPER GLACIAL AQUIFERS
- BASAL MAGOTHY: GRANULES, FINE TO VERY COARSE GRAVELS, AND MEDIUM TO COARSE SAND; WHITE AND GRAY
- CLAY, GRAY, WHITE, YELLOW, PINK OR RED. STIFF WITH HIGH PLASTICITY



VPB - VERTICAL PROFILE BORING

FT MSL - FEET RELATIVE TO MEAN SEA LEVEL

(59.77) - WATER LEVEL ELEVATION

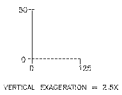
--63 ----- LINE OF EQUAL WATER LEVEL ELEVATION IN FT MSL

← DIRECTION OF GROUNDWATER FLOW (DASHED LINE INDICATES GENERALIZED DIRECTION OF GROUNDWATER FLOW FOR PURPOSES OF TWO DIMENSIONAL PRESENTATION)

•BORING SPECIFIC INFORMATION IS NOT AVAILABLE FOR RARITAN CONFINING UNIT IN THESE HORIZONS

NOTES:

1. HORIZONTAL COMPONENT OF REGIONAL GROUNDWATER FLOW DIRECTION IS TO SOUTH/SOUTHEAST.
2. GRAY SHADED AREAS ON LINE OF SECTION KEY MAP REPRESENT NORTHROP GRUMMAN OWNED PROPERTY.
3. VPBs VP-21 AND VP-74 ALONG WITH MWs GM-21D2, GM-78D, GM-78D2 AND GM-74D3 WERE DRILLED AS PART OF THE PHASE 2 HYDRAULIC EFFECTIVENESS EVALUATION BETWEEN JANUARY 2012 AND MARCH 2013.
4. WATER LEVEL ELEVATIONS ARE CALCULATED FROM DATA COLLECTED ON JULY 15, 2013. FOR WELLS GM-21D2, GM-78D AND GM-78D2, WATER LEVEL ELEVATIONS ARE FROM THE WELL DEVELOPMENT DATA (DATA FOR WELL GM-21D2 FROM FEBRUARY 2013. DATE FOR WELLS GM-78D AND GM-78D2 FROM APRIL, 2013).
5. ONCT REMEDIAL WELLS 17, 18 AND 19 PUMP AT APPROXIMATELY 1,000 GPM, 800 GPM AND 700 GPM, RESPECTIVELY. SOUTH RECHARGE BASINS RECEIVE APPROXIMATELY 2,200 GPM OF TREATED GROUNDWATER FROM ONCT SYSTEM.



DEFINITION OF TVOC CONTOURS (DASHED WHERE LESS CONTROL)

5 ----- 5 Micrograms per Liter (µg/L)

ONCT HYDRAULIC EFFECTIVENESS PROGRAM
NORTHROP GRUMMAN SYSTEMS CORPORATION
OPERABLE UNIT 2
BETHPAGE, NEW YORK

CROSS-SECTION E-E'
DIRECTIONS OF VERTICAL GROUNDWATER FLOW
(MODIFIED MARCH 2014)

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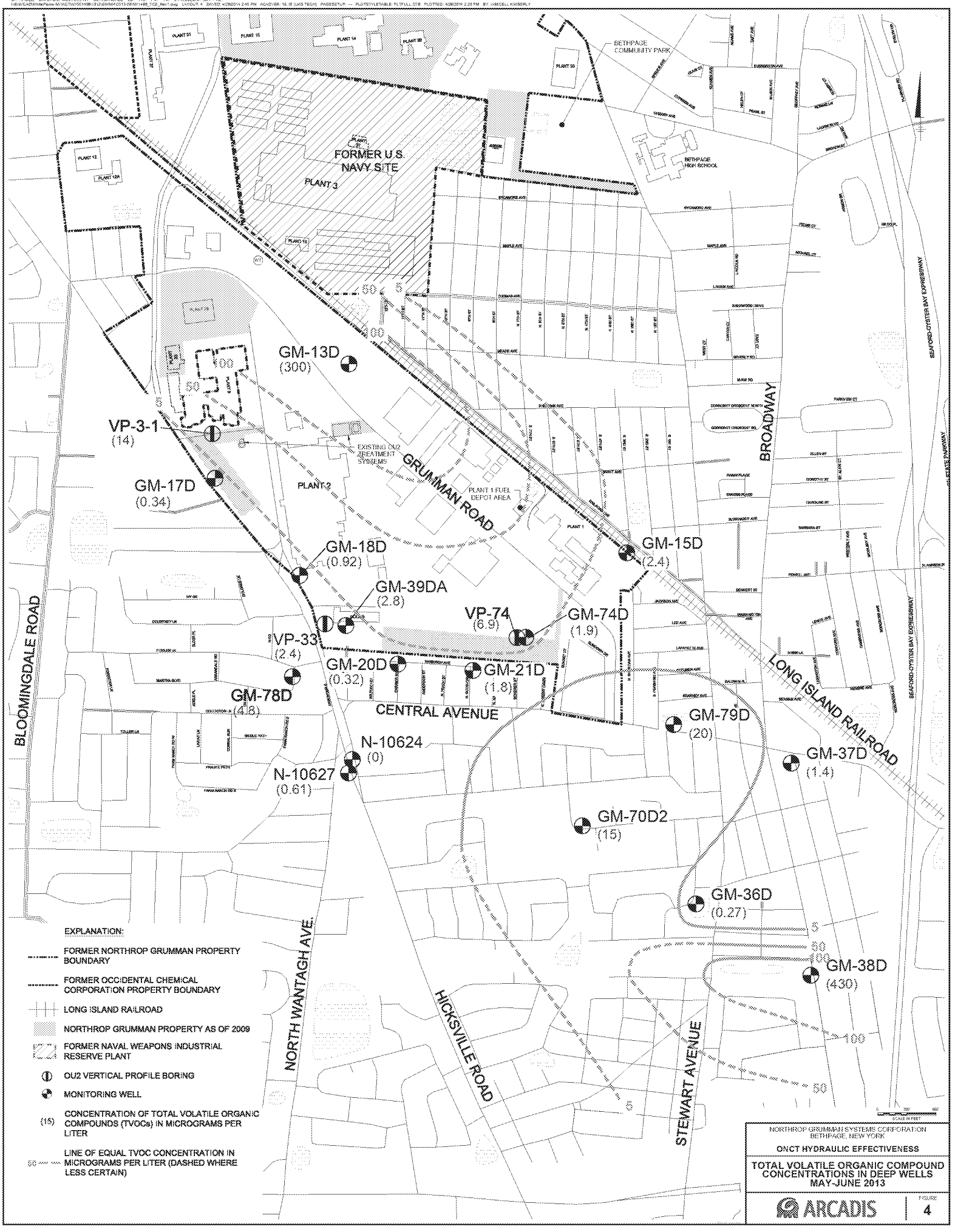
FIGURE 3

ED_002631A_00010556-00030



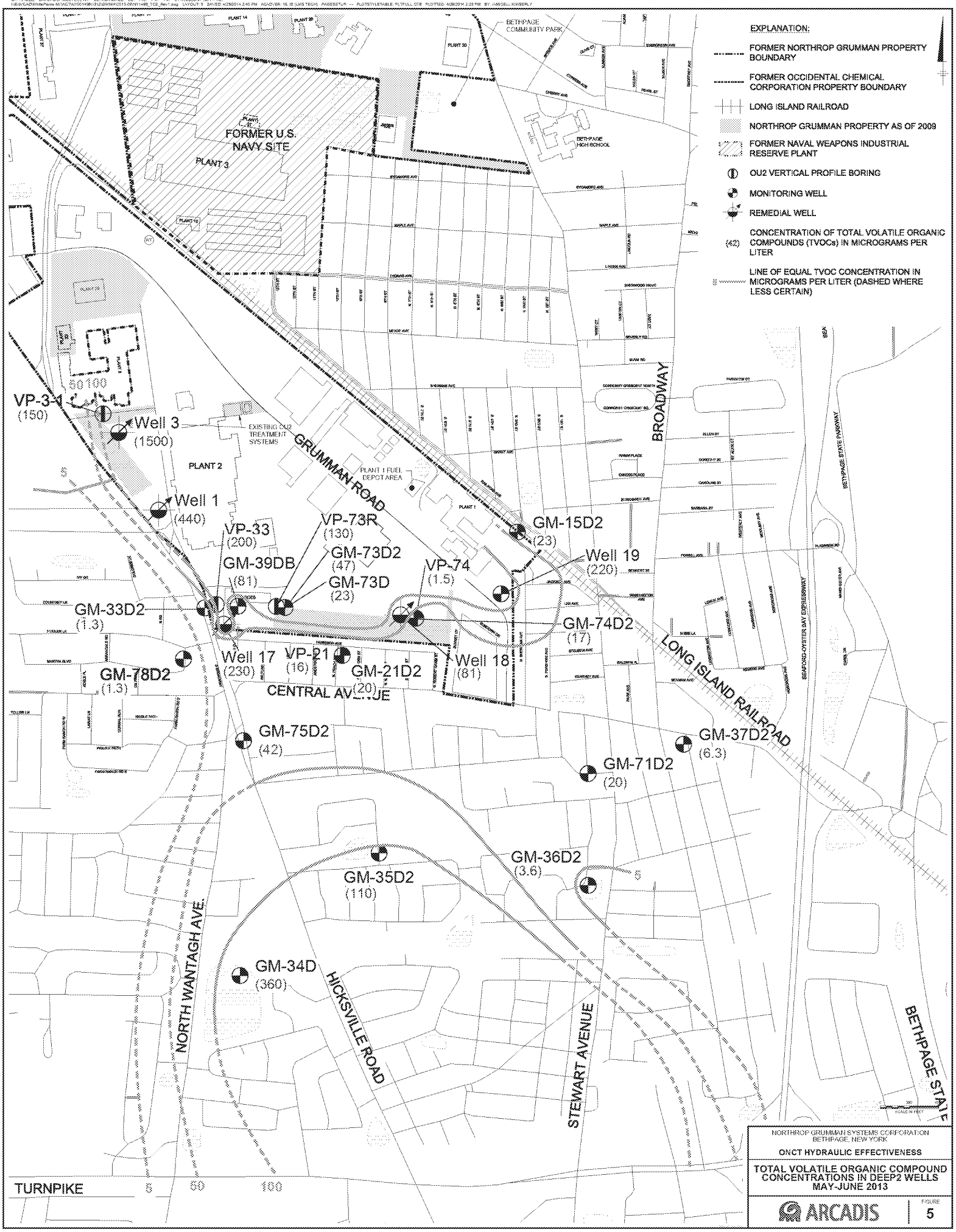
NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

ONCT HYDRAULIC EFFECTIVENESS

TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN DEEP WELLS MAY-JUNE 2013

ARCADIS

FIGURE 4



NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

ONCT HYDRAULIC EFFECTIVENESS

TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN DEEP2 WELLS MAY-JUNE 2013

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FIGURE 5

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Attachment A

Geologic Logs

Date Start/Finish: 1/17/2012-2/17/2012 **Drilling Company:** Delta **Driller's Name:** Brian **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 766 **Surface Elevation:** NA **Descriptions By:** AC/SX/DB	**Well/Boring ID:** VP-3-1 **Client:** Northrop Grumman Systems Corporation. **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0									
5									
10									
15									
20									
25									
30									

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
35										
40										
45										
50										Yellow and tan medium SAND, poorly sorted, well-rounded, trace pebbles.
55										
60										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
65										
70										
75										
80										
85										
90										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
95										
100								X		
105										
110		1	110 -111	1	NA	NA	0			Yellow tan very fine SAND, very well sorted. PEBBLES.
115										
120										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
125										
130		2	130 -131	0.5	NA	NA	0.1			Gray/white very fine SAND.
135										
140										
		3	144 -145	0.5	NA	NA	0.3			medium GRAVEL.
145										Yellow and tan medium SAND.
150								X		
155										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
160										
165										
170		4	170 -171	0.5	NA	NA	0.2			GRAVEL, rounded.
										Orange-yellow silty SAND.
175										
180										
185										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
190		5	190 -191	1.2	NA	NA	0.3			Grey CLAY, dense.
										Orange-yellow silty SAND, well-sorted.
										Light tan SAND with grey Clay.
195										
200								X		
205										
210		6	210 -211	0.5	NA	NA	0.2			Light grey/tan fine SAND.
215										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
220										
225										
230		7	230 -231	1	NA	NA	0.1			Orange-yellow medium SAND.
										Grey coarse SAND.
										Tan fine to fine to medium SAND.
										tan/grey very fine SAND with Grey clay lenses.
235										
240										
245										
250										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
255		8	255 -256	0.5	NA	NA	0.2			Grey medium SAND.
										Tan fine SAND.
								X		
260										
265										
270		9	270 -275	1.5	NA	NA	0.2			Dark grey silty CLAY, densly packed.
										Dark-medium grey sandy CLAY.
275										
280										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
285										
290		10	290 -293	2	NA	NA	0.2			Orange and yellow meadium SAND with lenses of Clay.
										Red/brown silty CLAY, dense.
										Orange and yellow medium SAND.
295										
300								X		Brown medium SAND with clumps of grey CLAY.
305										
310										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
315										
320								X		Brown medium SAND.
		11	323 -325	1.25	6 11 12 14	23	0			Light grey CLAY, high plasticity, no dilatancy, wet
										Brown and light/dark grey medium SAND.
325										Brown medium and fine SAND.
330										
335										
340								X		Brown medium and fine SAND, some clumps of grey Clay.
		12	343 -345	0.67	8 10 10 11	20				Light grey CLAY, soft, some brown fine to medium wet Sand, wet.
345										Brown fine and medium SAND, some clumps of grey Clay.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
350										
355										
360								X		
		13	363 -365	1.25	6 11 9 11	20	0			Light grey silty CLAY, low plasticity, low dilatancy, soft and light tan very fine and fine SAND, wet.
365										Light tan very fine and fine SAND.
370										
375										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
380										
		14	383 -385	1	5 8 20 26	28	0			Light grey very fine SAND, soft, little fine sand, wet.
										Grey/dark grey silty CLAY, soft, wet.
385										Light grey very fine and fine SAND, soft, wet.
										Light grey and tan medium and fine SAND, little very coarse sand.
										Tan fine and very fine SAND.
390								X		
395										
										Tan fine and very fine SAND, little mica, little clumps of silt.
400								X		
		15	403 -405	0.6	7 11 18 21	29	0			Light grey silty SAND, some very fine sand, soft, wet.
										Light tan medium SAND, some fine sand, soft, wet.
405										Light grey silty SAND, little medium sand, soft, wet.
										Light grey fine and medium SAND, some very fine Sand, little clumps of silt.
										Light tan fine SAND, some medium Sand and clumps of Silt.

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
410										
										Light tan fine SAND, some medium Sand, little coarse sand.
415										
										Light tan medium SAND, some fine and coarse Sand and clumps of Clay.
420										
		16	422 -424	0.7	20 30 39 42	69	0.1			Light tan fine and medium SAND, some very fine Sand, little white clay, medium stiff, wet.
										Medium SAND, some fine Sand, little coarse and very coarse sand and clumps of white clay.
425										
										Light tan coarse and medium SAND, some fine Sand.
430								X		
435		17	435 -437	0.6	7 10 12 15	22	0			Light grey with light tan bands coarse SAND, some medium Sand, little fine sand, medium stiff, wet .
										Light grey coarse and medium SAND, some Clay, soft, wet.
										Medium and coarse SAND, some fine sand and clumps of white clay.
440		18		1.1	7	42	0	X		Dark grey CLAY, high plasticity, no dilatancy, very stiff, interbedded with little very thin strips of light grey silty sand, moist.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
			440 -442		17 25 26					Brown CLAY, high plasticity, no dilatancy, stiff, interbedded with some yellow silty sand, moist.
										Grey fine SAND, some very fine Sand, little medium sand.
445		19	445 -447	1.1	7 6 7 11	13	0			Grey silty CLAY, soft, wet.
										Grey medium and fine SAND, some Silt and Clay.
								X		Grey fine SAND, some clumps of Silt and Clay, little medium sand.
450		20	450 -452	1.8	8 9 13 14	22	0			Light brown, grey, and dark grey striped SILT, some grey Clay, high plasticity, low dilatancy, very soft, wet.
										Grey very fine SAND and SILT, some clumps of clay.
455		21	455 -457	1.5	8 8 11 11	19	0			Light brown, grey, and dark grey striped SILT, interbedded some dark grey Clay, high plasticity, low dilatancy, soft, wet.
										Grey very fine SAND and SILT, some clumps of Clay.
460		22	460 -462	0.9	8 7 13 15	20	0			Dark grey CLAY, high plasticity, slow dilatancy, soft, wet
										Light tan and light grey striped silty SAND, mixed with some very fine Sand, soft, wet.
										Dark grey SILT, some very fine Sand and clumps of Clay.
								X		Dark grey very fine SAND and SILT, some clumps of clay.
465		23	465 -467	1.7	7 8 9 13	17	0			Light brown CLAY, high plasticity, slow dilatancy, soft, interbedded with some Silt and very fine Sand, well sorted, subrounded, wet.
										Yellow, light grey and dark grey striped very fine SAND, well sorted, angular to rounded, someSilt, soft, wet.
										Grey very fine SAND, some silt and clumps of clay.
470		24	470 -472	0.9	10 12 13 18	25	0			Light grey/light tan very fine and fine SAND, poorly sorted, angular to subrounded, soft, interbedded brown Clay layer, high plasticity, slow dilatancy, soft.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

ARCADIS
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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Grey very fine SAND, some clumps of Clay.
										Very fine SAND.
475		25	475 -477	1	6 9 11 14	20	0			Light grey, tan and yellow fine SAND, poorly sorted , angular to rounded, some medium Sand, little very fine sand, soft, wet.
										Very fine and fine SAND, some clumps of white Clay.
										Fine SAND, little medium sand and very fine sand.
480		26	480 -482	0.5	5 11 15 17	26	0			Light tan medium and fine SAND, poorly sorted, subangular to rounded, little very fine sand, soft, wet.
										Medium and fine SAND, some very fine Sand.
										Fine and medium SAND, little small pebbles.
485		27	485 -487	0.9	14 17 21 25	38	0			Light grey very fine and fine SAND, well sorted, subrounded to rounded, stiff, wet.
										Light grey and yellow bands very fine and fine SAND, poorly sorted, angular to rounded, stiff, wet.
										Dark grey sandy CLAY,some fine Sand, soft, wet.
										Very fine and fine SAND, little medium and coarse sand and clumps of clay.
								X		Light tan medium SAND, some coarse Sand, little small pebbles.
490		28	490 -492	0.6	6 8 13 13	21	0			Brown clay, high plasticity, no dilatancy, very stiff, little yellow very fine sand.
										Medium SAND, some fine Sand, little very coarse and coarse sand and small pebbles.
495		29	495 -497	2	5 10 11 16	21	0			Yellow and light grey very fine SAND, poorly sorted, angular to rounded, soft, wet, interbedded with little brown clay, high plasticity, no dilatancy, stiff, moist.
										Medium and fine SAND, little very coarse sand and small pebbles.
										Fine and very fine SAND, little medium and coarse sand.
500		30	500 -502	1.4	6 10 11 21	21	0			Light grey and brown CLAY, high plasticity, no dilatancy, very stiff, interbeded with some yellow, light grey, and red medium sand, little coarse sand and fine sand, poorly sorted, angular to rounded, wet.
										Fine and medium SAND, little very fine sand and clumps of grey clay.
										Fine and medium SAND, little very fine sand, coarse sand, and clumps of white clay.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

ARCADIS
Infrastructure · Water · Environment · Buildings

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
505		31	505 -507	0.7	13 14 22 28	36	0			Light grey, yellow and red medium SAND, poorly sorted, subangular, mixed with some fine sand, little coarse sand, moderate stiff, wet.
								X		Medium SAND, some fine Sand, little coarse to very coarse sand, clumps of grey/white clay.
510		32	510 -512	0.7	16 18 25 31	43	0			Light tan and grey medium SAND, poorly sorted, angular to subrounded, some fine Sand, little coarse sand, stiff, wet.
										Light grey sandy CLAY, low plasticity, slow dilatancy, stiff, wet.
										Light tan fine SAND, poorly sorted, angular and subangular, some very fine Sand, stiff, wet.
										Medium SAND, some fine Sand, little coarse sand and clumps of clay.
515		33	515 -517	1.5	6 7 11 14	18	0			Light grey sandy CLAY, high plasticity, moderate dilatancy, soft, wet
										Grey, light tan, and orange medium SAND, poorly sorted, angular to rounded, some fine Sand, little very fine and coarse sand, iron deposits in bottom 2".
										Medium SAND, some fine Sand, little small pebbles and clumps of clay.
										Medium SAND, some coarse Sand, little fine sand and clumps of clay.
520		34	520 -522	0.5	10 12 18 23	30	0			Light grey, tan and yellow medium SAND, well sorted, rounded and subrounded, little fine and coarse sand, moderate stiff, wet.
										Medium SAND, little fine and coarse sand.
										Medium SAND, little fine and coarse sand, small pebbles, and clumps of clay.
525		35	525 -527	0.7	12 14 18 25	32	0			Light tan, grey and orange medium SAND, well sorted, subrounded and rounded, some fine Sand, little coarse sand, moderate stiff, wet
										Medium SAND, some fine Sand, little coarse sand and small pebbles.
										Fine and medium SAND, little coarse sand.
530								X		Medium SAND, some fine Sand, little coarse sand, trace clumps of clay.
		36	533 -535	2	15 18 19 24	37	0			Light grey, light tan and orange fine SAND, some very fine Sand, well sorted , subrounded to subangular, trace fine sand, well sorted, subrounded and clay, soft, wet.
535										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine SAND, some very fine Sand, little coarse sand and trace clumps of clay.
		37	538 -540	1.3	8 11 13 16	24	0			Tan coarse SAND, poorly sorted, angular to subangular, some medium Sand, little fine sand, stiff, wet
										Tan and orange medium SAND, poorly sorted, subangular, some fine Sand, little light grey clay, stiff, wet.
540										Light grey fine SAND, well sorted, rounded, some very fine Sand, medium stiff, wet.
										Medium and fine SAND, little coarse sand.
		38	543 -545	1.4	6 9 12 17	21	0			Light grey, tan and light brown very fine and fine SAND, poorly sorted, angular and subangular, some Silt, trace clay, stiff, wet.
545										
								X		Medium SAND, some fine Sand, little coarse sand, trace small pebbles.
550		39	550 -552	2	9 8 10 12	18	0			Brown CLAY, high plasticity, very stiff, moist, some light tan very fine Sand, trace fine and medium sand, poorly sorted, angular, wet.
										Fine SAND, some medium Sand, little coarse sand.
555		40	555 -557	2	8 11 13 17	24	0			Banded light grey, tan and brown silty CLAY, medium plasticity, slow dilatancy, medium stiff, little very fine sand, wet.
										Fine and medium SAND, little coarse sand.
560		41	560 -562	0.7	5 6 9 9	15	0	X		Tan medium SAND, poorly sorted, subangular to rounded, some fine Sand, poorly sorted, subangular and rounded, trace coarse sand, subrounded, interbedded with little dark grey clay layers, soft, wet.
										Fine SAND, some very fine sand.
565		42	565 -567	0.5	8 9 13 16	22	0			Tan medium SAND, poorly sorted, angular to subrounded, some fine Sand, poorly sorted, subrounded, trace small pebbles, subrounded, medium stiff, wet, interbedded with little dark grey clay layer and iron deposits.

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
								X		Very fine to medium SAND and SILT
570		43	570 -572	0.5	6 5 88 -	93	0			Grey CLAY, very dense, wet.
										Very fine to medium SAND and SILT
575		44	575 -577	1.3	7 8 5 8	13	0			Grey CLAY, very dense, wet.
										Very fine silty SAND, some Pebbles.
580								X		
		45	581 -583	1.1	5 6 8 9	14	0			Grey very fine silty to medium SAND, well sorted, wet.
										Medium to coarse SAND, some fine Sand, little medium pebbles, angular to subangular.
585										
		46	586 -588	0.9	4 7 8 8	15	0			Grey medium to coarse SAND, some fine Sand, well sorted.
										Medium to coarse SAND and SILT, some medium Pebbles, angular.
590										
										Medium to coarse SAND and SILT, trace medium pebbles, angular to subangular.
595										
		47	596 -596	0.5	7 11 12 13	23	0			Brown medium to coarse SAND, poorly sorted, subrounded, little fine sand and pebbles, subrounded to subangular and grey clay, very soft, wet.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND and SILT, trace pebbles, angular to subangular.
600										Medium to coarse SAND and SILT, some subrounded to subangular Pebbles.
605										
		48	606 -608	1.1	12 18 23 31	41	0			Red brown to white fine to medium SAND and CLAY, trace medium pebbles, subrounded.
										Grey to white fine to medium SAND and SILT, trace meddium pebbles, wet.
610										Fine to medium SAND and medium PEBBLES, subrounded.
		49	611 -613	0.9	16 18 32 21	50	0			Fine to medium SAND and SILT and small to medium PEBBLES, subrounded to rounded.
615										Brown small to medium PEBBLES, subangular to subrounded.
		50	618 -620	0.6	11 15 15 23	30	0			Small to large PEBBLES, poorly sorted, subangular to subrounded.
620										Small to medium PEBBLES, subangular to subrounded.
		51	623 -625	0.5	8 11 16 27	27	0			Small to large PEBBLES, poorly sorted, subangular to subrounded.
625										Small to medium PEBBLES, well sorted, subangular to subrounded.
										Small to large, PEBBLES (quartz and trace micas), poorly sorted, subangular to subrounded, little fine sand.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Small to medium PEBBLES , well sorted, subangular to subrounded.
		52	633 -635	0.5	15 19 21 32	40	0			Small to large PEBBLES, poorly sorted, subangular to subrounded.
635										Small to large PEBBLES, well sorted, subangular to subrounded.
										White to red fine to medium SAND and SILT, some lenses of CLAY and some medium Pebbles, poorly sorted, subrounded to subangular.
640										Small to medium PEBBLES, well sorted, subangular to subrounded.
		53	643 -645	1	5 13 26 37	39	0			Medium PEBBLES, well sorted, subangular to subrounded, sand/silt lens at 643.5-643.6' bgs.
645										Medium PEBBLES, well sorted, subangular to subrounded.
		54	648 -650	0.5	9 15 16 20	31	0			White-grey medium to coarse SAND, some Silt, trace medium pebbles, subangular to subrounded, wet.
650										White-orange medium PEBBLES, subangular to subrounded, some fine Sand.
		55	653 -655	0	15 15 24 27	39	0			Medium to large PEBBLES, subangular to subrounded, some fine Sand.
655										Small to medium PEBBLES, subrounded, some Clay and Silt.
		56	658 -660	1.1	20 30 55 71	85	0			White CLAY, some Silt, wet.
										White/grey medium to coarse SAND, some Silt, little medium pebbles, trace clay lenses.
660										Medium PEBBLES, subangular to subrounded.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Site Location:
Bethpage, NY

Borehole Depth: 766

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		57	663 -665	0.9	12 12 9 15	21	0			White/grey medium PEBBLES, subangular to subrounded and medium to coarse SAND, some Silt.
665										White CLAY and medium PEBBLES, subangular to subrounded.
		58	668 -670	0.9	8 9 13 22	22	0			White medium to coarse SAND, some Silt, trace small to medium pebbles, subangular to subrounded, wet.
670										White CLAY and medium PEBBLES, subangular to subrounded.
		59	673 -675	0.5	6 12 15 17	27	0			Grey/white medium to coarse SAND, some Silt, trace medium pebbles, subangular to subrounded.
675										Medium PEBBLES, well sorted, subangular to subrounded, trace white clay.
		60	678 -680	0.5	5 7 13 22	20	0			White medium to coarse SAND, some Silt, trace medium pebbles, subangular.
680										Medium PEBBLES, well sorted, subangular, trace white clay.
		61	683 -685	1.1	6 9 16 24	25	0			Grey/white medium to coarse SAND, some red fine Sand and Silt, trace clay lenses.
685										Medium PEBBLES, well sorted, subangular, trace white clay.
		62	688 -690	0.5	8 12 14 22	26	0			White medium to coarse SAND, some Silt, trace clay lenses and medium pebbles, subangular.
690										Medium PEBBLES, well sorted, subangular, trace white clay.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		63	693 -695	0.5	10 12 20 23	32	0			Grey medium to coarse SAND, some Silt, white CLAY lens at 693.4-693.5' bgs, no plasticity, very soft, wet.
695										Medium PEBBLES, well sorted, subangular, trace white clay, no plasticity, very soft.
		64	698 -700	1	10 10 20 19	30	0			White CLAY, no plasticity, very soft.
										Grey medium to coarse SAND, some Silt, wet
700										Medium PEBBLES, well sorted, subangular, trace clumps of white clay, no plasticity, very soft.
		65	703 -705	0.9	10 11 12 15	23	0			Grey medium SAND, some Silt, wet.
705										Medium to large PEBBLES, well sorted, subangular to subrounded, trace white clay, no plasticity, very soft.
		66	708 -710	1	6 10 15 18	25	0			Grey medium SAND, some Silt, white clay lens at 708.5', no plasticity, very soft, wet.
710										Grey medium SAND, some silt, little medium pebbles, subrounded to subangular.
		67	713 -715	0.75	7 9 13 17	22	0			White-grey fine to medium SAND, some Silt, trace clumps of clay , lenses of reddish brown sand.
715										Fine to medium SAND, some clumps of white Clay, trace medium pebbles.
		68	718 -720	0.75	4 8 10 20	18	0			Grey-white SILT and very fine SAND, trace lenses of reddish brown sand and silt.
720										Fine to medium SAND and clumps of white CLAY.
		69	723 -725	1.2	4 9 11 20	20	0			Grey-white SILT and very fine SAND, trace white clay lenses.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
725										Fine to medium SAND and clumps of white CLAY.
		70	728 -730	0.9	15 14 15 21	29	0			Grey-white fine to medium SAND and SILT, wet, trace reddish brown clay lenses, no plasticity, very soft.
730										Clumps of white CLAY clumps and silty SAND.
										Grey-white fine to medium SAND and SILT, wet.
735										Clumps of white CLAY and silty SAND.
		71	738 -740	0.8	8 12 20 16	32	0			Grey brown fine to medium SAND and SILT, trace clay lenses, no plasticity, no dilatancy, wet.
740										Clumps of white CLAY and silty SAND.
		72	743 -745	1	10 14 15 17	29	0			Grey fine to medium SAND and SILT, some reddish tan sand lenses, trace mica fragments, wet.
745										Silty SAND, trace clumps of white clay.
		73	748 -750	0.3	720 720 - -	NA	0			GreyCLAY, medium plasticity, hard, trace pyrite fragments, moist.
750		74	750 -752	0.5	720 720 - -	NA	0			Grey CLAY, medium plasticity, hard, trace pyrite fragments, dry.
		75	752 -754	0.5	720 720 - -	NA	0			Grey CLAY, medium plasticity, hard, dry.
		76	754 -756	0.3	720 720 - -	NA	0			CLAY, medium plasticity, hard, dry.
755		77	756	0.5	720	NA	0			

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-3-1

Borehole Depth: 766

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
			-758		720 - -					Grey-blue CLAY, medium plasticity, hard, dry Grey-blue CLAY, medium plasticity, medium stiff, moist.
										Clumps of grey-blue CLAY.
760		78	760 -762	0.7	720 720 - -	NA	0			Grey CLAY, medium plasticity, hard, dry.
										Clumps of grey CLAY.
765		79	764 -766	0.6	720 720 - -	NA	0			Grey CLAY, medium plasticity, hard, dry.

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Date Start/Finish: 02/10/12 **Drilling Company:** Delta **Driller's Name:** Conrad **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 680 **Surface Elevation:** NA **Descriptions By:** Amber Caputo/Xuan Xu	**Well/Boring ID:** VP-33 **Client:** Northrop Grumman Systems Corporation **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
5									
10									
15									
20									
25									
30									
35									

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
40										
45										
50										
55										
60										
										Light tan medium SAND, well rounded, well sorted, high moisture content.
		1	63-65	1.0	NA	NA	0.3			Yellow tan medium SAND, trace Granules, well rounded, well sorted, medium moisture content.
65										
70										

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
75										
80										
85										
90										
95										
100										
105										
110										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		2	112 -114	1.3	4 7 7 15	14	0.3			Yellow/orange medium SAND, subrounded, well sorted, medium moisture content.
										Dark tan medium SAND, subrounded, well sorted, high moisture content.
										Yellow/tan medium SAND and fine SAND with some Silt, medium moisture content.
115										Dark red/brown medium SAND and SILT with thin (<1mm), black Clay bands, low moisture content.
										Light grey CLAY, medium plasticity with well sorted subangular Sand.
										Yellow/orange medium SAND, subrounded, well sorted, medium moisture content.
										Tan/grey medium SAND.
120										
125										
130										
135										
140										
145										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
190										
195										
200										
		3	162-164	1.3	[illegible]	12	0.3			Dark tan medium SAND, subrounded, well sorted with occasional Clay lenses.
										Light tan fine Clayey SAND, subangular, low moisture.
205										
210										
215										
220										
225										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
190									
195									
200									
205									
210									
									Brown fine to medium SAND, subrounded, well sorted, rapid dilatancy, low moisture.
	4	212-214	1.0	8 14 12	26	0.0			Brown fine to medium SAND, subrounded, well sorted with interbedded layers of orange/yellow/white Clay, no plasticity.
215									
220									Fine to medium SAND, trace coarse Sand, clumps of orange clay.
225									

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Borehole Depth: 680

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, trace coarse Sand, clumps of orange clay.
230										Fine and medium SAND with some clumps of orange and white Clay.
235										
240										Medium SAND with some fine and coarse Sand and some clumps of orange/light grey Clay.
245										
250										Fine and medium SAND, clumps of soft orange and light grey Clay.
255										
260								X		
										Brown to light brown coarse SAND, well sorted, subrounded. One large iron-rich sandstone pebble observed at 262.2' bgs.
		5	262-264	0.9	6 6 6 10	16	0.3			Light brown medium SAND with some fine Sand and Silt.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
265										
270										Medium SAND with little Silt.
275										
280										Medium SAND, subrounded with little fine Sand, trace coarse Sand.
285										
290										Medium to coarse SAND, little fine Sand and Silt.
295										
300										Medium SAND with some fine Sand, trace coarse sand.

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Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND with some fine Sand, trace coarse sand.
305										
310										
		6	311-313	2.2	6 8 8	16	0.2			Light brown medium SAND with trace coarse Sand and little fine Sand, subrounded, poorly sorted.
										Orange/yellow coarse SAND with little fine Sand and trace Clay, rounded, well sorted with veins of black silty clay.
										Brown medium SAND with little Clay and trace coarse Sand, subrounded, poorly sorted.
										Orange/tan coarse SAND with some Clay, rounded, well sorted.
315										Light tan coarse SAND with trace Biotite, rounded, well sorted.
										Medium to coarse SAND, subrounded, poorly sorted, small clumps of white/orange Clay.
320								X		
325										
330										Fine SAND with some clumps of orange/white Clay and trace medium to coarse Sand, subrounded, poorly sorted.
335										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine SAND with some clumps of orange/white Clay and trace medium to coarse Sand, subrounded, poorly sorted.
340										Medium SAND, subrounded, well sorted with trace Biotite Flakes.
345										
350										Medium to fine SAND with few Biotite Flakes, traces of coarse Sand and clumps of orange/white Clay.
355										
360								X		
										Light brown/grey medium to fine SAND with trace coarse Sand, subrounded, poorly sorted.
		7	362-364	1.4	49/50	22	0.1			Light tan to browny orange medium to fine SAND with trace coarse Sand with laminations of orange and black clay.
										Light grey medium to fine SAND with trace coarse Sand, subrounded, poorly sorted.
365										Medium to fine SAND with some clumps of Clay and trace coarse to very coarse Sand.
370										Medium to fine SAND with clumps of orange/white Clay and trace coarse Sand and small Pebbles.
375										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Borehole Depth: 680

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to fine SAND with clumps of orange/white Clay and trace coarse Sand and small Pebbles.
380										Medium to coarse SAND, some Muscovite Flakes, some clumps of white Clay, trace coarse sand and small pebbles.
385										
390										Grey CLAY, dense and medium to coarse SAND, subangular, poorly sorted.
395										
400								X		
		8	402-404	1.5	10 13 18 25	31	0.3			Light brown medium to fine SAND with some fine to very fine Sand, subrounded, poorly sorted.
										Grey fine to very fine SAND with some Silt and Clay, subrounded, poorly sorted.
										Grey fine to very fine SAND with some Clay and Silt, low plasticity, poorly sorted.
										Orange/brown to orange/grey medium to very fine SAND with some Clay and Silt, no plasticity, poorly sorted.
405										Medium to fine SAND with some Clay and trace Muscovite Flakes.
										Grey SILT, soft with some medium Sand.
410										Grey SILT, soft with some medium to fine Sand.

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Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
420										Grey SILT, soft with some medium to fine Sand.
										Light brown coarse SAND, little fine to medium Sand.
		9	422-424	1.8	22 28 25 20	53	0.1			Blue-grey medium to fine SAND with some Muscovite and little Silt.
										Light brown/orange fine SAND with some Silt and Clay, subrounded, poorly sorted.
425								X		Medium SAND, subrounded.
430										
435										
440								X		
										Light brown medium to coarse SAND with little fine Sand, subrounded, poorly sorted, wet.
		10	442-444	1.3	5 7 9 15	16	NA			Orange and dark grey medium to coarse SAND with some fine to very fine Sand and Silt, subrounded, poorly sorted.
										Light brown medium to coarse SAND, some fine Sand, trace silt, well sorted.
445										Light grey medium and coarse SAND, poorly sorted and CLAY, high plasticity.
										Light brown medium to fine SAND, subrounded, poorly sorted.
										Orange coarse SAND, little fine Sand and Silt, rounded, poorly sorted.
										Light brown medium to coarse SAND, with little Granules, subrounded, poorly sorted, wet.
450										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Light brown medium to coarse SAND, with little Granules, subrounded, poorly sorted, wet.
455										
460								X		
		11	462-464	1.6	4 13 17 15	40	0.0			Light brown medium to coarse SAND, subrounded, poorly sorted, wet.
										Light brown medium to coarse SAND, subrounded, poorly sorted with clumps of grey Clay, high plasticity, rapid dilatancy, wet.
465										Orange/brown medium to coarse SAND with some fine Sand, subrounded, poorly sorted, trace grey clay lenses, low plasticity.
										Very coarse SAND and GRANULES, subangular with some medium to fine Sand.
470										
475										
480										
										Light brown coarse SAND, some medium to fine Sand, subrounded, poorly sorted.
		12	482-484	1.3	4 6 7 10	13	0.0			Light grey medium to coarse SAND and CLAY, high plasticity, no dilatancy.
										Orange/brown medium to coarse SAND with little Silt and Clay, subrounded, poorly sorted.
485								X		Light brown/orange medium to coarse SAND subrounded, poorly sorted.
										Medium to fine SAND, subrounded, poorly sorted.
490										Medium to fine SAND, subrounded, poorly sorted with small clumps of grey Clay, soft.

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to fine SAND, subrounded, poorly sorted with small clumps of grey Clay, soft.
495										
500								X		
		13	502-504	1.04	17 19 20 23	39	0.1			Light tan coarse to medium SAND with some fine Sand, subrounded, poorly sorted, trace black and light tan silt, no plasticity.
										Light tan medium to fine SAND, trace coarse Sand, subrounded, poorly sorted.
										Orange/black medium SAND, subrounded, poorly sorted, some lenses of light tan sandy Silt.
505								X		Light grey coarse SAND, with some medium and fine Sand, subrounded, poorly sorted.
										Medium to fine SAND, subrounded, poorly sorted.
510										
515								X		
520										Light brown medium to fine SAND, subrounded, poorly sorted with trace coarse Sand and Silt.
		14	520-522	1.0	9 16 22 31	38	0.2			Light brown medium to coarse SAND, subrounded, poorly sorted, high water content.
										Light tan medium to coarse SAND with some Granules, subrounded, poorly sorted, wet.
										Coarse SAND with some very coarse Sand to small Granules, poorly sorted, little clumps of clay.
525										

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Coarse SAND with some very coarse Sand to small Granules, poorly sorted, little clumps of clay.
530										Coarse SAND with clumps of CLAY, trace Granules.
535								X		
540										Light grey CLAY, high plasticity with little fine Sand.
		15	540-542	1.2	22 22 27 35	49	NA			Light brown coarse SAND with some medium to fine Sand, subrounded, poorly sorted.
										Orange medium to coarse SAND and SILT with little fine and very fine Sand, subrounded, poorly sorted.
										Medium to coarse SAND with some small Pebbles.
545										
550										
555										
560										
										Light brown medium SAND with some fine and very fine Sand, subrounded, poorly sorted .
		16	562-564	0.2	4 8 13 17	21	0.1			Very light tan small to medium PEBBLES, with some fine Sand and Silt, subrounded, poorly sorted.
										Orange laminated CLAY, very dense, high plasticity, no dilatancy and SILT.
565								X		GRANULES to small PEBBLES, subangular, poorly sorted.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										GRANULES to small PEBBLES, subangular, poorly sorted.
570										GRANULES to medium PEBBLES, subangular, poorly sorted with some medium Sand, subrounded.
575										
580										Light tan GRANULES to medium PEBBLES, subrounded to subangular, poorly sorted.
		17	580-582	1.3	6 16 19 23	35	0.2			Very fine SAND and SILT, poorly sorted, light brown with little orange Clay laminations, low plasticity.
										Dark grey Silty CLAY, large black Lignite Mass (~30 mm).
										GRANULES to small PEBBLES and clumps of grey CLAY.
585										Clumps of grey and white CLAY with some Granules, subangular.
590										
595										
600										Light orange coarse to very coarse SAND with little Granules, poorly sorted.
		18	600-602	1.4	20 20 15 12	35	NA			Red/orange coarse SAND, with some medium to fine Sand, some muscovite, poorly sorted.
										Light orange coarse to very coarse SAND with some Granules and medium Pebbles and trace fine Sand, angular to subangular, poorly sorted.
										Medium SAND, poorly sorted and light grey CLAY, no plasticity.

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
605										GRANULES and small PEBBLES, with some coarse Sand, subangular.
										Dark brown medium SAND, subrounded, poorly sorted and Silty CLAY, low plasticity, high dilatancy, wet.
		19	606-608	2.0	8 13 15 19	28	0.4			White/light tan fine to very fine SAND, subrounded, poorly sorted, moist.
										Light pink medium to fine SAND with trace coarse Sand, subrounded, poorly sorted, moist.
								X		Fine SAND, subrounded and Silty CLAY with some small to large Pebbles, trace pyrite pebbles.
610										Light tan fine SAND with little medium and very fine Sand, subrounded, poorly sorted, wet.
										Light orange medium to fine SAND, subrounded, poorly sorted, moist.
										Medium to coarse SAND, trace Granules, subrounded, poorly sorted.
615										
620										Coarse SAND and clumps of white/dark grey CLAY.
625										Light tan fine SAND and SILT, subrounded, poorly sorted, wet.
		20	625-627	1.9	14 22 26 17	48	NA			Light brown medium to coarse SAND, with some fine Sand and Silt, subangular to subrounded, moist.
								X		Medium SAND, some coarse Sand.
630		21	630-632	2.0	50 36 25 38	61	0.0			Light tan medium SAND, subrounded and rounded, poorly sorted with some coarse SAND, subangular, poorly sorted, little fine sand, rounded, poorly sorted and little small pebbles (1/4"-1/2"), subrounded, wet. Tan clay in shoe, soft, high plasticity.
										Medium SAND and GRANULE, some small Gravel.
635		22	635-637	2.0	22 26 30 35	56	0.0			Light grey and tan small PEBBLES, subrounded, poorly sorted with some coarse SAND, angular, poorly sorted, little medium sand and little fine sand, wet.
										Small PEBBLES and medium SAND, little fine Sand.
640		23	640-642	2.0	18 18 42 52	60	0.0			Light grey small PEBBLES, subrounded, poorly sorted with some coarse Sand, subangular to angular, poorly sorted, little medium sand and trace fine sand.

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"S.A.A" is Same As Above.

Client: Northrop Grumman Systems Corporation

Well/Boring ID: VP-33

Site Location:
Bethpage, NY

Borehole Depth: 680

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Tan, grey and orange small PEBBLES and GRANULE, some iron Oxide Concretions.
645		24	645-647	2.0	30 1 27 32	28	0.0			Light gray small PEBBLES, subrounded, poorly sorted and coarse SAND, angular, poorly sorted, some medium Sand, subangular, poorly sorted, trace fine sand, wet.
								X		
650		25	650-652	0.9	8 23 34	57	0.2			PEBBLES with some GRANULES, angular and some medium to coarse SAND.
										Light grey Silty CLAY, high plasticity, no dilatancy, moist.
										Very fine SAND and SILT with few coarse Sand.
655		26	655-657	2.0	9 15 20 28	35	0.1			Large to very large PEBBLES, subangular to subrounded.
										Medium to fine SAND, subrounded, poorly sorted with some coarse Sand, wet.
										Light grey coarse to very coarse SAND, subrounded, poorly sorted with some Granules, wet.
										Light tan GRANULES to medium PEBBLES, subrounded to subangular, poorly sorted, wet.
										Light brown GRANULES to small PEBBLES, subrounded to subangular, poorly sorted, wet.
660		27	660-662	1.3	20 22 26 26	48	0.2			Light grey with orange and deep maroon marbling CLAY and Silty CLAY.
		28	662-664	0.8	23 27 29 30	56	0.1			Medium to light grey CLAY, very stiff, high plasticity, no dilatancy, dry.
665		29	664-666	0.8	13 16 18 24	34	0.2			"S.A.A".
		30	666-668	0.5	17 19 20 22	39	0.1			Light grey (top 4") to dark orange CLAY, high plasticity, no dilatancy, moist edges.
		31	668-670	1.0	20 22 26 28	48	0.0			Dark orange CLAY, very stiff, high plasticity, dry.
670										Orange CLAY.
675		32	674-676	0.5	15 19 22 22	44	0.0			"S.A.A".
										Grey and orange CLAY, soft.
										Light grey SILT and fine SAND.
		33	678-680	0.3	3 8 15 15	23	0.0			

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"S.A.A" is Same As Above.

Date Start/Finish: 12/27/2011-1/23/2012 **Drilling Company:** Delta **Driller's Name:** Jason **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 682 **Surface Elevation:** NA **Descriptions By:** Sunny Xu/Chris Goldsmith	**Well/Boring ID:** **VP-73R** **Client:** Northrop Grumman Systems Corporation. **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0									
5									
10									
15									
20									
25									
30									

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
35										
40										
45										
50		1	50 -52	0.9	25 36 50/6 -	NA	0.3 0.3			Dark brown fine SAND, little medium sand and silt, trace clay, wet Brown SILT, trace sand and clay, wet Light tan fine to medium SAND, trace silt, wet.
55										
60										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
65										
70										
75										
80										
85										
90										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
95										
100		2	100 -102	2	9 18 18 20	36	0.6 0.6 0.6 0.6			Light brown very fine to fine SAND, little silt and clay, wet.
105										
110										
115										
120										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
125										
130										
135										
140										
145										
150		3	150 -152	1.6	10 15 26 30	41	0.1			Yellow brown and white fine SAND, well sorted, rounded, wet.
155										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
160										
165										
170										
175										
180										
185										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
190										
195										
200		4	200 -202	1.3	12 20 30 30	50	0			Tannish brown fine SAND, well sorted, subrounded to rounded, wet.
										Yellow-grey fine to medium SAND, well sorted, subangular to subrounded, with thin orange laminations of medium Sand, subrounded to rounded, wet.
205										
210										
215										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
220										
225										
230										
235										
240										
245										
250		5	250 -252	1.7	8 12	32	0.1			Tan CLAY, high plasticity, low dilatancy, stiff, with stripes of yellow brown very fine Sand, wet

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
					20 30					Yellowish brown very fine SAND, some Silt, wet.
255										
260										
265										
270										
275										
280										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
285										
290										
295										
300		6	300 -302	1.5	10 14 15 38	29	0.1			Very fine to fine SAND, little medium Sand, trace silt and clay, interbedded tan, light grey, and light brown laminae, wet.
305										
310										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
315										
320										
325										
330										
335										
340										
345										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
350		7	350 -352	1.3	9 6 5 16	11	0.1			Tan medium SAND, little fine sand, interbedded yellow and dark grey laminae, wet.
355										
360										
365										
370										
375										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
380										
385										
390										
395										
400										
405		8	405 -407	1.3	6 12 10 29	22	0.6	X		Light tan fine SAND, little medium sand, trace silt, wet.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
410										
415										
420										
425		9	425 -427	1.2	3 3 8 12	11	0.4 0.4 0.4	X		Very pale grey-tan CLAY, no plasticity, very soft, some very fine to fine Sand, wet Light brown and light tan fine to medium SAND, trace silt and clay, wet Very pale grey-tan CLAY, high plasticity, very soft, little very fine sand, wet.
430										
435										
440										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
445		10	445 -447	1.3	10 20 40 40	60	0	X		Grey sandy CLAY, wet Yellow, grey and white fine SAND, well sorted, little very fine sand.
450										
455										
460										
465		11	467 -469	2	6 6 13 13	19	0	X		Yellow, grey and white fine SAND, well sorted, wet.
470										

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Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
475										
480								X		
		12	482 -484	1	2 2 12 12	14	0			Grey, white and yellow fine SAND, well sorted, wet.
485										
490										
495										
500								X		
		13	502 -504	1.2	11 22 29 30	51				Yellow and white medium to coarse SAND, poorly sorted, wet.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
505										
510										
515										
520										
525								X		
		14	527 -529	1.5	4 4 8 12	12				Grey/white fine to medium SAND, well sorted, wet.
530										
535										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
540								X		
		15	542 -544	1.3	2 2 2 6	4				White/grey fine to medium SAND, well sorted, wet
										Orange brown and light grey fine SAND, well sorted, wet.
545										
550										
555										
560										
565										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
570								X		
		16	572 -574	1.2	NA	NA				White/light grey fine SAND, well sorted, trace silt, wet.
575										
580								X		
		17	582 -584	1.3	7 14 21 20	35	0			Dark grey silty SAND, well sorted, wet.
585										
590										
595										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Site Location:
Bethpage, NY

Borehole Depth: 682

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
600								X		
		18	602 -604	1	12 18 19 24	37	0			Tan, yellow ,and white fine to medium SAND, well sorted, trace coarse sand, wet.
605										
610										
615										
620								X		
		19	622 -624	1.2	2 4 8 15	12	0			White and yellow clayey fine SAND, wet
										Light grey and white fine SAND, well sorted, wet.
625										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		20	630 -632	0.8	12 12 6 6	18	0			White, yellow and pink fine to coarse SAND, poorly sorted, some subrounded to rounded gravel, wet.
635		21	635 -637	1.3	6 4 18 32	22	0			White GRAVEL, subrounded, wet
										Dark grey SILT, with Clay and Sand
640										
		22	642 -644	0.8	12 12 40 50	52	0			White, tan and light grey fine to medium SAND, well sorted, some gravel, subrounded, wet
645										
		23	647 -649	2	25 58 63 60	121	0			White, pink and yellow fine to medium SAND, with Gravel, subrounded
650										
		24	652 -654	1.5	4 15 80 100+	95	0			White and yellow coarse GRAVEL with fine to coarse SAND, well sorted, wet
										White fine to coarse SAND, well sorted, trace gravel, wet.
655										
		25	657 -659	1.5	12 14 24 52	38	0			White, yellow and pink fine to medium SAND, poorly sorted, some Gravel, trace silt.
660										

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-73R

Borehole Depth: 682

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		26	662 -664	0.8	15 22 26 30	48				Light grey, white, red and orange CLAY, very stiff.
665		27	664 -666	1	18 38 48 18	86				Light grey and red CLAY, hard.
		28	666 -668	1.3	3 3 10 15	13				Red, light grey and white CLAY, stiff.
		29	668 -670	1.2	15 15 25 32	40				Red and light grey CLAY, hard.
670		30	670 -672	0.8	8 8 32 10	40				Red, light grey and white CLAY, hard.
		31	672 -674	1	10 80 100+ -	NA	0			Light grey and red CLAY, hard.
675		32	674 -676	1	4 5 30 28	35	0			Red and light grey CLAY, hard.
680		33	680 -682	1.2	5 15 15 25	30	0			Red and light grey CLAY, hard.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Date Start/Finish: 10/23/12-12/15/12 **Drilling Company:** Unitech **Driller's Name:** Jimmy Evans **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 877 **Surface Elevation:** **Descriptions By:** Sunny Xu/Karla Miranda	**Well/Boring ID:** **VP-74** **Client:** Northrop Grumman Systems Corporation. **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
									SANDS ranging from fine to very coarse, some Granules and Pebbles at 0-50' bgs.
5									
10									
15									
20									
25									
30									
35									

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										SANDS ranging from fine to very coarse, some Granules and Pebbles at 0-50' bgs.
40										
45										
										CLAY, wet, soft, medium plasticity, slow dilatancy.
50		1	50-52	1.0	NA	NA	22.3	X		Brown coarse SAND, poorly sorted, subangular, some medium Sand, well sorted, subrounded, trace small pebbles, wet, soft, no odor.
										Medium and coarse SAND, little fine Sand, some granules.
55		2	55-57	0.0	45 50 75	NA	NA			NO RECOVERY. In shoe: brown CLAY with trace Silt, soft, wet.
										Medium SAND, little coarse Sand, some granules.
60		3	60-62	0.5	42 50 73	NA	0.0			GRANULE and medium PEBBLES upto 1", trace coarse Sand, poorly sorted, angular, trace clay on top, wet. Coarse SAND present in shoe.
										GRANULE and coarse SAND.
65		4	65-67	0.6	24 50>5	NA	0.0			Brown medium PEBBLES and medium SAND, well sorted, rounded, trace very coarse Sand, trace fine sand, wet.
										Medium SAND and GRANULE, trace coarse Sand.
70		5	70-72	0.7	39 46 50>4	NA	1.4			Coarse SAND, poorly sorted, angular to subangular and medium Sand, poorly sorted subangular, some small pebbles, trace clay on bottom.
										Medium SAND and GRANULE.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND and GRANULE.
75		6	75-77	0.2	48 50>4	NA	0.0			Grey/tan CLAY, soft, wet, trace fine Sand.
										Medium SAND, trace coarse Sand, some granules.
80		7	80-82	0.0	47 50>3	NA	0.0			No recovery. Rock in shoe.
										Medium and coarse SAND, some Granule.
85		8	85-87	0.4	37 50>4	NA	0.0			Tan medium SAND, well sorted, subrounded, some fine Sand, well sorted, rounded trace granules and pebbles upto 1.5", stiff, wet.
										Medium SAND and GRANULE.
90										Grey and red CLAY, medium soft, low plasticity, moderate dilatancy, wet.
		9	91-93	0.8	30 50>4	NA	0.0			Tan fine SAND, poorly sorted, subangular to subrounded, some medium Sand, poorly sorted, subangular, little medium pebbles upto 1", medium stiff, wet.
										Tan medium SAND and GRANULE.
95								X		
100										Medium PEBBLES angular and grey CLAY, soft, low plasticity, moderate dilatancy, wet.
		10	100 -102	0.5	25 50>3	NA	0.0			Grey/red medium SAND, poorly sorted, subangular and subrounded, some fine Sand, poorly sorted, subrounded, wet.
										Tan medium SAND, coarse SAND and GRANULES.
105										
110										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
115										Tan medium SAND, coarse SAND and GRANULES.
120		11	120 -122	0.7	14 14 21 21	35	0.0			Tan medium PEBBLES upto 1.5", trace Granules, trace medium sand. Could be slough, granule falling down from borehole.
										Tan medium and coarse SAND and GRANULES.
125										Coarse SAND and dark grey CLAY.
130										
135		12	135 -137	0.4	24 50>4	NA	0.0			Dark grey CLAY, trace coarse Sand, high plastcity, slow dilatancy, soft, wet.
										Grey fine SAND, some medium Sand.
140		13	140 -142	1.1	25 50>3	NA	0.6			Dark grey CLAY, high plasticity, slow dilatancy, soft, wet.
		14	142 -144	0.4	50 50>3	NA	0.4			Dark grey and light grey CLAY, low plasticity, quick dilatancy, medium soft, wet.
145										Grey fine SAND, some medium Sand.

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
150		15	150 -152	1.3	25 50>5	NA	0.3			Dark grey CLAY, high plasticity, slow dilatancy, very stiff, moist, 1" thick light grey Sand lens at 150-151.3' bgs, soft, moist.
155		16	154 -156	1.2	26 33 50/5	NA	0.3			Light grey very fine SAND, some Clay, low plasticity, quick dilatancy, soft.
								X		Dark grey medium SAND, some coarse Sand, little fine sand.
160										
165										
170										
175										
										Red and grey CLAY, high plasticity, moderate dilatancy, stiff, trace medium Sand, moist.
180		17	180 -182	0.4	100/4	NA	0.4			Brown medium SAND, well sorted, rounded and subangular, little fine Sand, well sorted, rounded, firm, wet.
										Medium SAND, some fine sand and trace coarse sand.
185								X		

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
190, 195									Medium SAND, some fine sand and trace coarse sand.
200	18	200 -202	1.2	31 50 50>5	NA	0.3			Tan with grey and yellow layers, fine SAND, well sorted, subrounded and subangular, some very fine Sand, medium soft, wet.
205, 210, 215							X		Medium SAND, some fine Sand, trace coarse sand.
220	19	220 -222	0.6	26 50 50>5	NA	0.3			Tan medium SAND, well sorted, sunangular and subrounded, some fine Sand, well sorted, subrounded, little grey fine sand, trace silt, firm, wet.
225							X		Medium SAND, some fine Sand, little coarse sand.

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
230										Medium SAND, some fine Sand, little coarse sand.
235										
240										
		20	240 -242	0.4	36 50>5	NA	0.4			Tan medium SAND, well sorted, subrounded and subangular, some fine Sand, well sorted, subrounded, trace very fine sand, firm, wet.
245								X		Medium SAND, some fine Sand, little coarse sand.
250										
255										
260										
		21	260 -262	0.7	42 50>5	NA	0.0			Tan medium SAND, well sorted, subrounded, some fine Sand, well sorted, subrounded, little very fine sand, quartz, firm, wet.
										Fine SAND and medium SAND with trace coarse Sand.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine SAND and medium SAND with trace coarse Sand.
265								X		
270										
275										
280		22	280 -282	1.1	26 50>5	NA	0.0			Red/gray CLAY, high plasticity, slow dilatancy, very stiff, moist.
										Fine SAND, trace medium Sand.
285		23	285 -287	0.7	17 50>2	NA	0.0			Tan medium SAND, some fine Sand, well sorted, subrounded, some very fine snd, wet, firm.
290								X		Medium SAND, some fine Sand, little very fine sand.
295										
300										Tan silty CLAY, soft, low plasticity, moderate dilatancy, some fine and medium Sand, wet.
			300 -302		26 50>5					Fine to medium SAND, well sorted, subangular to subrounded, some very fine Sand, trace silt, firm, wet, laminations of black

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		24		0.7		NA	0.0			organics with yellow iron deposits.
								X		Medium and fine SAND, little coarse Sand.
305										
310										
315										
320										Tan medium SAND, well sorted, subangular and subrounded, some fine Sand, well sorted, subrounded, trace silt, dense, wet.
		25	320 -322	0.7	55 50/2	NA	0.4			Interbedded layers of black ORGANIC material, CLAY and yellow medium SAND, low plasticity, moderate dilatancy, firm, wet.
								X		Medium SAND, some fine Sand.
325										
330										
335										

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND, some fine Sand.
340		26	340 -342	0.9	36 50>5	NA	0.4			Dark grey CLAY, very stiff, slow dilatancy, high plastciity, trace Silt, moist.
345										Medium SAND, and some Clay.
350										
355										Dark grey CLAY, medium stiff, high plasticity, moderate dilatancy, trace fine Sand, little silt, wet.
		27	355 -357	0.6	50>2	NA	0.4			Yellow tan medium SAND, well sorted, subrounded, little fine Sand, well sorted, subrounded, soft, and wet.
360										Medium to fine SAND, some soft Clay.
365		28	365 -367	1.1	42 50>4	NA	0.3			Light grey medium to fine SAND, well sorted, medium loose, subrounded, little subangular, 2" black Organic Layer.
370								X		Medium to fine SAND, some soft Clay.
375										

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to fine SAND, some soft Clay.
380		29	380 -382	1.4	50 50>3	NA	0.2			Light to dark grey CLAY, stiff, low plasticity, moderate dilatancy, some silt, moist
										Dark gray CLAY, high plasticity, low dilatancy, stiff, moist.
385		30	385 -387	0.7	40 50>3	NA	0.2			Light grey medium SAND, well sorted, subrounded, soft, wet.
390								X		Soft CLAY, some medium Sand.
395										
400		31	400 -402	0.5	35 50>3	NA	0.0			Light grey medium SAND, well sorted, subangular to subrounded, medium soft, wet.
405										Medium SAND, little coarse Sand, little fine sand, trace clay.
410		32	410 -412	0.8	50 50>3	NA	0.0			Light grey medium SAND, subangular, well sorted, soft, trace grey sandy Clay, small lamination of 0.1 in, wet.
								X		Medium SAND, little coarse Sand.

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
420										Medium SAND, little coarse Sand.
425										
430		33	430 -432	0.4	100>5	NA	0.1			Light grey medium SAND, some coarse Sand, well sorted, subangular, trace white clay, high plasticity, low dilatancy, medium soft, wet.
435								X		Medium SAND, some fine Sand.
440										
445										
450		34	450 -452	0.3	100>5	NA	0.0			Tan coarse SAND, poorly sorted, angular and subangular, some medium Sand, poorly sorted subangular and subrounded, trace fine sand, loose, wet.
										Medium to coarse SAND, some fine sand.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND, some fine sand.
455								X		
460										
465										
470		35	470 -472	0.75	75 50>4	NA	0.1			Medium SAND, well sorted, subrounded and fine Sand, well sorted, subrounded, little very fine sand, trace grey clay, medium dense, wet.
								X		Medium SAND, some fine Sand, little coarse sand.
475										
480										
485										
490			490		65					

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		36	-492	0.4	50>3	NA	0.1			Tan medium SAND, well sorted, subrounded and rounded, some fine sand, well sorted, rounded, trace very fine sand, dense, wet.
								X		Coarse SAND, little medium Sand.
495										
500										Medium SAND, some Clay, little fine sand.
505										
510		37	510 -512	0.0	100>5		NA			No recovery, possibly CLAY.
								X		Medium SAND, some Clay, little fine sand.
515										
520										
525										

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Client: Northrop Grumman Systems Corporation.

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Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND, some Clay, little fine sand.
530		38	530 -532	0.2	100>4	NA	NA			Light grey medium SAND, well sorted, subrounded, some fine Sand, well sorted, subrounded, trace coarse sand, well sorted, rounded, soft, wet.
535								X		Medium SAND, some coarse Sand, trace clay.
540										
545										
550		39	550 -552	0.2	150>4	NA	NA			Light grey medium SAND, well sorted, subrounded, some fine Sand, well sorted, subrounded, soft, wet, one 1" dark grey stone.
555										Medium SAND, little fine Sand, trace coarse sand.
560										Gray CLAY, soft, wet with trace granule.
		40	560 -562	0.5	150>5	NA	0.4			Light grey medium SAND, well sorted, subrounded to subangular, well sorted, some fine Sand, well sorted, subrounded, medium dense, wet.
565								X		Medium SAND, little fine Sand, trace mud/clay.

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Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND, little fine Sand, trace mud/clay.
570										
575										
580		41	580 -582	0.3	150>5	NA	0.4			Light grey medium SAND, well sorted, subrounded, little fine Sand, well sorted, subrounded, medium stiff, wet.
								X		White and dark grey CLAY, some medium Sand, trace coarse sand.
585										
590										
595										
600		42	600 -602	1.1	49 50>3	NA	0.2			Grey fine SAND, well sorted, subrounded, some Clay, low plasticity, high dilatancy, medium stiff, wet.
								X		

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
605										
		43	605 -607	1.3	54 50>3	NA	0.2			Grey fine SAND, subrounded, well sorted, and grey clay, slow plasticity, high dilatancy, soft, wet.
								X		
610										
		44	610 -612	1.3	60 50>3	NA	0.2			Grey fine SAND, well sorted, subrounded, some CLAY, low plasticity, high dilatancy, soft, wet.
								X		
615										
		45	615 -617	0.3	45 50>1	NA	0.2			Dark grey CLAY, high plasticity, low dilatancy, little fine Sand, well sorted, rounded, medium stiff, moist.
620										
		46	620 -622	0.3	100>5	NA	0.4			Dark grey CLAY, low plasticity, high dilatancy, soft, wet.
625										
		47	625 -627	0.0	100>5	NA	NA			Some GRANULES, poorly sorted, subangular.
630										
		48	630 -632	0.3	100>5	NA	0.3			Grey to light grey medium SAND, well sorted, subrounded, little fine Sand, well sorted, subrounded, soft, moist.
635										
		49	635 -637	0.0	150>4	NA	NA			GRAVEL, subrounded to subangular, well sorted about an inch in diameter.
										GRAVEL and medium SAND.
640										
		50	640 -642	0.3	100>5	NA	0.5			Grey medium SAND, poorly sorted, subangular to subrounded, some coarse Sand, poorly sorted, angular, little fine sand, trace granules, wet.

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Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										GRANULE and coarse SAND.
645		51	645 -647	0.3	156>4	NA	0.0			White and grey medium and large GRAVEL, wet.
										GRANULES and coarse SAND.
650		52	650 -652	0.4	NA	NA	0.0			White medium PEBBLES, quartz, rounded, trace coarse Sand, wet.
										GRANULES and coarse SAND.
655		53	655 -657	1.0	100>4	NA	0.0			Red with yellow and grey CLAY, very stiff, high plasticity, low dilatancy, dry.
										Coarse SAND and grey and red CLAY.
660		54	660 -662	0.5	50>4	NA	0.0			Grey CLAY, very stiff, high plasticity, low dilatancy, dry.
665		55	665 -667	0.5	50>4	NA	0.0			Red, yellow and grey CLAY, very stiff, high plasticity, low dilatancy, dry.
										White, grey and red CLAY.
670		56	670 -672	0.3	50>4	NA	0.0			White, yellow and red CLAY, stiff, high plasticity, low dilatancy, dry.
										Red, grey and white CLAY.
675		57	675 -677	0.4	50>5	NA	0.0			Red with grey and white CLAY, very stiff, high plasticity, low dilatancy, dry.
										Red, grey and white CLAY.
680										

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		58	680 -682	0.0	50>4	NA	0.0	X		White/grey CLAY.
								X		White CLAY.
685		59	685 -687	0.2	100>4	NA	0.0			Tan medium SAND, well sorted, subrounded, some fine Sand, soft, wet.
690		60	690 -692	0.2	100>4	NA	0.1			
										Red CLAY, trace medium Sand.
695		61	695 -697	0.5	100>4	NA	0.0			Tan medium SAND, well sorted, subrounded, some fine Sand, soft, dense, wet.
										Red and white CLAY, medium Sand.
700		62	700 -702	0.1	100>4	NA	0.0	X		Tan medium SAND, well sorted, subrounded, some fine Sand, soft, wet.
								X		Medium SAND.
705		63	705 -707	0.1	100>3	NA	0.0			Tan medium SAND, poorly sorted, subangular, some fine Sand, trace very fine sand, dense, wet.
										Medium SAND.
710		64	710 -712	0.5	100>4	NA	0.0			White/grey medium SAND, poorly sorted, subangular, some fine Sand, trace very fine sand, dense, wet.
										Medium and coarse SAND.
715		65	715 -717	0.6	50	NA	0.0	X		Very fine SAND and SILT, trace of white Clay with yellow and grey laminations, no plasticity, quick dilatancy, medium dense, wet.
								X		Red and grey CLAY, some coarse and medium Sand.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Red and grey CLAY, some coarse and medium Sand.
	720	66	720 -722	1.0	20 40	NA	0.1			Tan Silty CLAY with black and yellow streaks, soft, low plasticity, quick dilatancy, some fine Sand.
										Coarse and medium SAND.
	725	67	725 -727	0.0	100>3	NA	0.0	X		Sand and silt.
										Medium SAND and white CLAY.
	730	68	730 -732	0.8	64 50>4	NA	0.1			Grey, black and tan interbedded SILT and CLAY, firm and moist.
										Red and white CLAY, some fine Sand.
	735	69	735 -737	0.4	50>4	NA	0.1			Dark grey CLAY, very stiff, high plasticity, slow dilatancy, dry.
										Grey CLAY and coarse Sand.
	740									Dark grey CLAY, very stiff, high plasticity, slow dilatancy, dry.
		70	740 -742	0.4	100>4	NA	0.1	X		Tan medium and fine SAND, poorly sorted, subrounded, some Silt, trace clay, soft, wet.
										Medium SAND, trace coarse Sand.
	745	71	745 -747	0.0	100>4	NA	NA			Medium SAND.
										Medium SAND, trace coarse Sand.
	750	72	750 -752	0.6	75	NA	0.0	X		Light grey fine SAND, poorly sorted, subangular, some very fine Sand and some medium Sand, medium dense, wet.
										Coarse SAND, some fine Sand.
	755		755							Light grey very fine SAND and SILT, some Clay, soft, wet.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		73	-757	1.0	50>4	NA	0.0			Light grey very fine SAND and SILT, some Clay, soft, wet.
										Grey CLAY, medium Sand.
760		74	760 -762	0.2	80	NA	0.0			Light grey Clayey SILT, soft, wet.
										Dark grey CLAY, medium Sand.
765		75	765 -767	0.4	100>6	NA	0.0	X		Light grey fine SAND, well sorted, subrounded, some very fine Sand and Silt, trace clay, soft, wet.
										Medium and fine SAND, some dark grey Clay.
770		76	770 -772	0.0	50	NA	0.0			Clayey SAND.
										Dark grey CLAY, medium Sand.
775		77	775 -777	0.0	50 50>3	NA	0.0			No recovery.
										Red and dark grey CLAY, medium Sand.
780		78	780 -782	0.2	100>4	NA	0.0	X		Light grey fine SAND, well sorted, subrounded, some very fine Sand and some Silt, trace medium sand, soft, wet.
										Fine to medium SAND, some light grey Clay.
785		79	785 -787	0.5	70>6	NA	0.5			Light grey fine SAND, well sorted, subrounded, some very fine Sand, little medium sand and silt, dense, wet. Thin layer of black organic matter at 785.1' bgs.
										Fine to medium SAND, some Clay.
790		80	790 -792	0.7	50>6	NA	0.7	X		Light/pale grey fine SAND, well sorted, subrounded, some very fine Sand and Silt, little clay, soft, slow dilatancy, wet.
										Fine to medium SAND, some red Clay.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
									Fine to medium SAND, some red Clay.
795	81	795 -797	0.6	60>6	NA	0.6			Light grey fine SAND, wells sorted, subrounded, some very fine Sand and Silt, little medium sand and clay, soft, slow/little dilatancy, wet.
									Fine to medium SAND, some Clay.
800	82	800 -802	0.5	55>6	NA	0.5	X		Light grey fine to medium SAND, subangular to subrounded, some Silt and very fine Sand, trace clay, loose, wet
									Grey CLAY, medium to very coarse Sand.
805	83	805 -807	0.4	60>6	NA	0.4			Light grey fine SAND, subangular to subrounded, well sorted, some very fine Sand and Silt, little clay, trace medium sand, very slow dilatancy, wet.
									Fine to medium SAND.
810	84	810 -812	0.3	70>6	NA	0.3			Light grey fine SAND, subangular to rounded, very well sorted, some very fine Sand, little clayey silt, soft, dense, low plasticity, wet.
									Fine to medium SAND.
815	85	815 -817	0.3	75>6	NA	0.3	X		Medium grey medium to coarse SAND, subangular, poorly sorted, with increasing course content at 815.2' bgs, some fine Sand and Silt, trace clay with black organic (lignite), mottling throughout, trace gravel, loose.
									Fine to medium SAND, some black Lignite, some clay, some coarse sand/granule fraction.
820	86	820 -822	0.5	75>6	NA	0.5			Light grey fine to medium SAND, subangular to subrounded, well sorted, some very fine Sand, little silt, trace granule, clay, dense, wet.
									Fine to medium SAND, some coarse Sand, some clay and black Lignite pieces.
825	87	825 -827	0.3	75>6	NA	0.3			Light grey fine to medium SAND, subangular to subrounded, well sorted, some Silt and very fine Sand, little clay, moderately dense, trace granule and very coarse sand, wet.
									Medium to coarse SAND, some Granules and very coarse Sand, trace organic chards and clay.
830	88	830 -832	<0.1	50>6	NA	0.0			Dark grey CLAY and Silty CLAY with little Silt, little granules to gravels, high plasticity, slow dilatancy, wet.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND with small black lignite pieces.
835		89	835 -837	0.5	65>6	NA	0.0	X		Light grey medium SAND, subangular to subrounded, well sorted, some very fine to fine Sand, some silt, loose, soft, wet, trace pockets of soft black organic matter.
										Fine to medium SAND, some Silt, some coarse sand, very small pieces of black hard organic material and black clay.
840		90	840 -842	0.3	60>6	NA	0.0			Light grey fine to medium SAND, subangular to subrounded with predominantly subangular coarse fraction, poorly sorted, some Silt and coarse Sand, little clay with additional light to dark grey clay globules, loose, wet.
										Fine to medium SAND, some coarse Sand, some scattered black lignite pieces, some red and beige clay.
845		91	845 -847	0.2	90>6	NA	0.1			Medium SAND, subangular to subrounded, well sorted, some fine Sand and Silt, little clay, trace coarse sand, loose, wet.
										Fine to medium SAND, little coarse Sand and Granules, scattered small pieces of hard black lignite, some clay.
850										Black hard ORGANIC MATTER (Lignite).
		92	850 -852	0.8	75>6	NA	0.1			Sandy CLAY with some silt and dark grey clay lumps.
										Medium to coarse Sand, subangular with mica granules/flakes, large amount of black hard lignite chards. Lumps of medium grey Clay with lignite pieces in it.
855		93	855 -857	0.4	40>6	NA	0.3			Medium to dark grey CLAY, with little to some Silt, some black mottling (organics), trace medium to coarse sand, white mica flakes, hard compact, dense, high plasticity, dry, low dilatancy.
										SAND and CLAY.
860		94	860 -862	1.0	50>6	NA	0.4			Light to medium Silty CLAY, some very fine Sand, moderately stiff, low plasticity, moist with some black laminations.
										Medium to coarse SAND, some fine Sand, small black lignite chards, small white mica flakes, small clumps of light grey clay.
865		95	865 -867	0.8	50>6	NA	0.4			Dark grey CLAY with little very fine Silt, very dense, hard, highly compacted, moderately cemented, low to medium plasticity, very slow dilatancy, little damp, slightly fissured.
										Medium to coarse SAND, perfuse small to medium chards of Lignite, small subrounded grains of mica, lumps of grey clay.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: VP-74

Borehole Depth: 877

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
870		96	870 -872	0.8	60>0	NA	0.2			Very hard dense compacted grey CLAY, low plasticity, moderate cementation, no dilatancy, some black lignite.
										Fine to medium SAND, trace coarse Sand, black organics/lignite chards, medium grey clay.
875		97	875 -877	0.8	40>6	NA	0.1			Dark grey CLAY, very hard, dense, dry, compact with little to trace Silt, gradation towards darker grey at 875.4-875.8' bgs, strongly cemented, medium plasticity, very slow dilatancy, fissured with some glossy, smooth surfaces along fissure planes.

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Date Start/Finish: 01/15/13 **Drilling Company:** Unitech **Driller's Name:** Jimmy Evans **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 872 **Surface Elevation:** NA **Descriptions By:** Karla Miranda	**Well/Boring ID:** GM-21D2 **Client:** Northrop Grumman Systems Corporation **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
									Medium to coarse SAND, some Granules and small Pebbles, trace gravel.
5									
10									Coarse SAND and GRANULES, some medium to coarse Gravel and small Pebbles, little medium sand, trace large pebbles.
15									
20									Medium to very coarse SAND, some Granules (Quartzite), trace fine sand and gravel.
25									
30									Medium to coarse SAND, some very coarse Sand, little granules and small pebbles, trace medium to large pebbles and fine sand.
35									

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND, some very coarse Sand, little granules and small pebbles, trace medium to large pebbles and fine sand.
40										Coarse GRAVEL and PEBBLES.
45										
50										Medium to coarse SAND, some very coarse Sand, little granules, trace fine sand.
55										
60										Medium to coarse SAND, some very coarse Sand and Granules, little small pebbles.
65										
70										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
75										Medium to coarse SAND, some very coarse Sand and Granules, little small pebbles.
80										Medium to coarse SAND, some very coarse Sand and Granules, little small pebbles, trace fine sand.
85										
90										Medium to coarse SAND, little Granules, trace small pebbles and fine sand.
95										
100										Medium to coarse SAND, some Silt and fine Sand, little very coarse sand and granules, clumps of white/light grey clay with yellow and red color smears.
105										
110										Medium to coarse SAND, subangular to subrounded, some very coarse Sand and Granules, little small to large pebbles and grey with dark black and red streaks clay, medium plasticity, low dilatancy, soft, wet.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
115									Medium to coarse SAND, subangular to subrounded, some very coarse Sand and Granules, little small to large pebbles and grey with dark black and red streaks clay, medium plasticity, low dilatancy, soft, wet.
120	1	120 -122	0.4	23 36 50>4	NA	0.0			Large PEBBLES, trace small Pebbles (Quartzite).
125									Medium to coarse SAND, some fine Sand and Silt, little grey and orange clay, soft, wet, medium plasticity, low dilatancy, trace very coarse sand and granules.
130									
135									
140	2	140 -142	0.6	50>5	NA	0.0			Medium to large PEBBLES, trace grey with orange streaks silty Clay, soft, medium plastcity, low dilatancy, trace granules, wet.
145									Fine to medium SAND, trace very coarse Sand and Granules, mica flakes.

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Well/Boring ID: GM-21D2

Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
150										Fine to medium SAND, trace very coarse Sand and Granules, mica flakes.
155										
160										Medium to large PEBBLES (Quartzite).
		3	160 -162	0.4	50>4	NA	0.0			Fine to medium SAND, subangular to subrounded, some very fine Sand and Silt.
										Fine to medium SAND, some very fine Sand and Silt, trace granules, mica flakes and small lumps of grey and orange clay, soft, wet.
165										
170										
175										
180										Large PEBBLES, small lense of orange Clay at 180.1' bgs, soft, wet.
		4	180 -182	1	20 28 35	NA	0.0			Fine to medium SAND, subangular to subrounded with interbedded lenses of alternating grey and orange Clay, high plasticity, low dilatancy, soft, some Silt and very fine Sand, wet.
										Fine to medium SAND, some coarse Sand and Granules, little silt and fine sand, trace mica flakes.
185										

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Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, some coarse Sand and Granules, little silt and fine sand, trace mica flakes.
190										
195										
200		5	200 -202	NA	50>3	NA	NA			NO RECOVERY
										Fine to medium SAND, subangular to subrounded, trace Silt, coarse sand and granules, mica flakes.
205										
210										
215										
										Medium to large PEBBLES (Quartzite).
220		6	220 -222	0.3	60>6	NA	0.0			Lenses of orange fine to medium SAND with little Silt and grey CLAY, soft, high plasticity, low dilatancy, wet.
										Medium to coarse SAND, subangular to subrounded, some very fine Sand and Silt, trace coarse sand and granules, mica flakes.
225										

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Site Location:
Bethpage, NY

Borehole Depth: 872

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND, subangular to subrounded, some very fine Sand and Silt, trace coarse sand and granules, mica flakes.
230										
235										
240		7	240 -242	0.6	18 30 31	NA	0.1			Orange/tan fine to medium SAND, subangular to subrounded, some very fine Sand and Silt, trace clay and mica flakes.
										Light brown fine to medium SAND, some coarse Sand and Granules, trace silt and mica flakes, some orange clay.
245										
250										
255										
260		8	260 -262	0.6	50>5	NA	0.1			Dark grey laminated Sandy SILT and black ORGANIC MATTER. Interbedded envelopes of dark grey Clay, orange streaks, stiff, dense, high plasticity, low dilatancy, moist at bottom (260.5-260.6' bgs).
										Clumps of dark grey CLAY, some Silt, fine to medium sand, trace coarse sand and black organic chards.

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Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Clumps of dark grey CLAY, some Silt, fine to medium sand, trace coarse sand and black organic chards.
265										
270										
275										
280		9	280 -282	0.4	50>5	NA	0.1			Very fine to fine SAND, little Silt, trace clay and mica flakes, orange smears across sample; dark grey/black streak at 280.1' bgs.
										Fine to medium SAND, subangular to subrounded, little coarse sand and granules, trace mica flakes, clumps of dark grey silty clay, soft.
285										
290										
295										
300		10	300 -302	0.4	50>5	NA	0.2			Very fine to fine SAND, subangular to subrounded, some Silt, little medium sand, trace clay. Increasing clay content starts at 300.4' bgs. Orange and yellow mottling throughout sample. Dark grey clay lense at 300.1' bgs.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, little coarse Sand and dark grey and yellow Clay, soft, trace multi-colored granules, silt and mica flakes, wet.
305										
310										
315										
320										Brown/dark grey CLAY, soft, very high plasticity, low dilatancy, moist.
		11	320 -322	0.4	50>5	35	0.4 0.5			Interbedded laminations of dark brown very fine Sandy SILT and black, hard Organic material.
										Very fine to fine SAND, little medium Sand, clumps of dark grey and yellow clay with black organic chards and mica flakes.
325										
330										
335										

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Very fine to fine SAND, little medium Sand, clumps of dark grey and yellow clay with black organic chards and mica flakes.
340		12	340 -342	1.3	23 23 23 23	NA	0.2			Light brown/beige very fine to fine SAND, subrounded, some Silt, trace clay and medium sand.
										Fine to medium SAND, some dark grey Silt and Clay, soft, trace coarse sand, granules, mica flakes, wet.
345										
350										
355										
360		13	360 -362	0.6	50>5	NA	0.2			Dark grey CLAY, stiff, compact, high plasticity, medium dilatancy, little Silt, fissured throughout.
										Dark grey/yellow and beige CLAY, soft, little fine to medium Sand, trace coarse sand and granules.
365										
370										
375										

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Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Dark grey/yellow and beige CLAY, soft, little fine to medium Sand, trace coarse sand and granules.
380		14	380 -382	0.4	50>5	NA	0.4			Beige very fine to fine SAND, subangular to subrounded and SILT.
										Pale beige and dark grey/black CLAY, some fine Sand, little medium sand, trace coarse sand, granules, mica flakes.
385										
390										
395										
400		15	400 -402	0.2	60>5	NA	0.8			Red very fine to fine SAND, subangular to subrounded, some Silt, trace clay.
										Coarse to very coarse SAND and GRANULES, subangular, some medium Sand, subangular to subrounded, little fine sand, trace silt.
405										
410										

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Borehole Depth: 872

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
420										Coarse to very coarse SAND and GRANULES, subangular, some medium Sand, subangular to subrounded, little fine sand, trace silt.
		16	420 -423	0.15	50>5	NA	0.6			Medium SAND, subangular to subrounded, some fine Sand and Silt, little coarse sand, subangular, trace light grey/black clay, trace subangular granules, wet.
425										Medium to coarse SAND, subangular to subrounded, well sorted, some fine Sand, trace silt, silty clay and granules.
430										
435										
440		17	440 -443	0.3	50>5	NA	0.6			Fine SAND, subrounded, well sorted, some medium Sand, subangular to subrounded, well sorted, little silt, trace grey silty clay, wet.
445								X		Medium to coarse SAND, subangular to subrounded, poorly sorted, some coarse to very coarse Sand, subangular, little fine sand and silt, trace granules and mica flakes, clumps of white/light beige and dark grey clay.
450		18	450 -452	0.3	50>5	NA	0.1			Light grey fine SAND, subrounded, well sorted, some medium Sand, subangular to subrounded, well sorted, trace grey clay.
										Fine to medium SAND, subangular to subrounded, well sorted, some coarse Sand, little silt and clumps of dark grey silty clay.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, subangular to subrounded, well sorted, some coarse Sand, little silt and clumps of dark grey silty clay.
455		19	455 -457	0.2	50>5	NA	0.3			Grey coarse SAND, subangular to subrounded, poorly sorted, some medium to fine Sand, subangular to subrounded, poorly sorted, little silt.
460		20	460 -462	0.3	75>5	NA	0.2			Coarse SAND, subangular, poorly sorted and medium SAND, subangular to subrounded, well sorted, little fine Sand, subrounded, well sorted, little silt. Medium to large pebble at 460-460.15' bgs.
								X		Medium SAND, subrounded to rounded, well sorted, some fine Sand, subrounded, well sorted, little coarse sand, trace silt and very fine sand.
465		21	465 -467	0.7	46 50>5	NA	0.3			Light grey fine to very fine SAND, subrounded to rounded, very well sorted and light grey SILT, some grey Clay, very low plasticity, high dilatancy, wet.
										Fine to medium SAND, trace coarse Sand.
470		22	470 -472	0.2	75>5	NA	0.2			Dark grey SILT and very fine SAND, loose, non-plastic, high dilatancy, little Clay.
										Orange/tan fine SAND, subrounded to rounded, well sorted and medium SAND, subangular to subrounded, well sorted, some coarse Sand, subangular, poorly sorted, little silt.
475		23	475 -477	0.1	75	NA	0.0			Light grey/Grey SILT and CLAY, loose, non-plastic, high dilatancy, little fine to very fine Sand, trace medium and coarse sand, subangular to subrounded.
										Medium to coarse SAND, subangular to subrounded, poorly sorted, some fine Sand, subrounded to rounded, well sorted, trace silt.
480		24	480 -482	0.2	100>5	NA	0.0			Light brown medium SAND, subangular to subrounded, well sorted and fine SAND, subrounded to rounded, well sorted, little very fine Sand, trace coarse sand, subangular, trace silt.
								X		Coarse to very coarse SAND, subangular, poorly sorted, some medium Sand, subangular to subrounded, well sorted, little granules, trace fine sand, clumps of white clay.
485		25	485 -487	0.25	75>5	NA	0.0			White with yellow and dark grey streaks Sandy CLAY, loose, very low plasticity, high dilatancy, some coarse Sand, subangular, trace granules, wet.
										Medium to coarse SAND, subangular to subrounded, poorly sorted, little fine Sand and Granules, trace very fine sand and silt, small lumps of dark grey clay.
490										Light grey fine SAND and SILT, little medium Sand, moist.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		26	490 -492	0.25	75>5	NA	0.0			Pinkish brown CLAY, soft, loose, high plasticity, low dilatancy, little Silt, wet.
										Coarse SAND and GRANULES, subangular, poorly sorted, some medium Sand, subrounded to rounded, well sorted, little fine sand.
495		27	495 -497	0.2	100>5	NA	0.0			Coarse to very coarse SAND and GRANULES, subangular, poorly sorted, some medium Sand, subangular to subrounded, well sorted, little fine sand, trace silt.
										Coarse SAND to GRANULES, subangular and medium SAND, subangular to subrounded, well sorted, trace fine Sand.
500		28	500 -502	0.2	100>5	NA	0.0			Coarse to very coarse SAND, subangular, well sorted, some medium Sand, subangular to subrounded, little fine sand, trace silt.
										Coarse to very coarse SAND, angular to subrounded, poorly sorted and medium SAND, subrounded to rounded, well sorted, little fine Sand.
										Orange Silty CLAY and medium to coarse SAND, loose, wet.
505		29	505 -507	0.4	90>5	NA	0.1			Grey coarse to very coarse SAND, angular to subangular, poorly sorted and GRANULES, angular, some fine to very fine Sand, subangular to subrounded, well sorted and Silt, little medium sand, subrounded to rounded, well sorted, trace white clay, soft, moist.
										Coarse to very coarse SAND, angular to subangular, some medium Sand, subrounded to rounded, well sorted, little fine sand, trace silt and granules.
										Grey very coarse SAND, angular to subrounded, poorly sorted and GRANULES, angular, some fine to very fine Sand, loose, some Silt, trace clay, wet.
510		30	510 -512	0.2	150>5	NA	0.2			White/Light Beige CLAY, soft, low plasticity, medium dilatancy, little Silt, trace medium to coarse, poorly sorted sand.
										Coarse to very coarse SAND, angular to subangular, poorly sorted and GRANULES, angular, some medium Sand, little fine sand, clumps of white beige clay with silt.
										Coarse SAND, angular to subangular, poorly sorted, to GRANULES, angular and SILT, some very fine to fine Sand, little clay.
515		31	515 -517	1.1	35 50>5	NA	0.3			Light grey CLAY, soft, medium plasticity, low dilatancy, with little Silt and very fine Sand, trace medium sand, moist.
										Light grey CLAY, soft, high plasticity, low dilatancy, moist with little Silt.
								X		Coarse SAND and very coarse SAND, angular to subrounded, poorly sorted, some medium Sand, subrounded to rounded, well sorted, little fine sand, trace very fine sand and silt.
520		32	520 -522	0.3	100>5	NA	0.0			Grey very fine to fine SAND, subangular to subrounded, soft, little Silt, little medium Sand, subangular to subrounded, well sorted, trace white clay.
										Coarse to very coarse SAND, some medium Sand, trace fine sand and granules, small clumps of white/beige clay.
525		33	525 -527	0.45	75>5	NA	0.0			Fine to medium SAND, subangular to rounded, poorly sorted, little Silt, trace coarse sand and granules.
										Medium SAND, subangular to subrounded to coarse SAND, angular to subangular, poorly sorted, little fine sand, small clumps of dark grey clay.

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Site Location:
Bethpage, NY

Borehole Depth: 872

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND, subangular to subrounded to coarse SAND, angular to subangular, poorly sorted, little fine sand, small clumps of dark gray clay.
530		34	530 -532	0.4	75>6	NA	0.4			Very fine to fine SAND, subangular to subrounded, well sorted, soft, little Silt, trace medium sand, angular to subrounded, poorly sorted, wet.
535		35	535 -537	0.2	38 50>4	NA	0.0			Grey very fine to fine SAND, subangular to subrounded, well sorted, soft, some Silt, trace white/beige clay, soft, wet.
										Coarse to very coarse SAND and GRANULES, some medium Sand, little fine sand.
540		36	540 -542	0.0	70>6	NA	NA			NO RECOVERY. Fine Clayey SAND, some Silt in shoe.
								X		Coarse to very coarse and medium SAND, subangular to subrounded, poorly sorted, little fine Sand and Granules.
545		37	545 -547	0.0	100>4	NA	NA			NO RECOVERY. Clayey fine SAND with little Silt in shoe, trace medium Sand.
		38	547 -549	0.3	100>5	NA	0.0			Light brown medium SAND, subangular to subrounded, poorly sorted, loose, little coarse Sand, trace silt, trace dark greyrust with small gold specks granules to medium pebbles, brittle, hard, wet.
550										Medium SAND, subangular to subrounded, poorly sorted, some coarse Sand, little fine to very fine sand.
		39	552 -554	0.2	100>4	NA	NA			Light grey medium SAND, subrounded to rounded, well sorted, some fine to very fine Sand, trace silt, loose, wet.
555								X		Medium SAND and coarse SAND, little fine Sand, small clumps of white clay.
										White CLAY, soft, low plasticity, medium dilatancy, with little Sand and Silt, wet.
560		40	560 -562	0.4	100>5	NA	0.0			Grey fine SAND, subangular to rounded, poorly sorted, little very fine and medium Sand, trace silt, soft, wet.
										Medium SAND and coarse SAND, little fine Sand.
565		41	565 -567	0.2	100>4	NA	0.0			Beige medium SAND, subrounded to rounded, well sorted, some coarse Sand, angular to subrounded, poorly sorted, little fine sand, trace silt, loose, wet.

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DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
							X		Medium SAND, subangular to subrounded, some coarse Sand, little fine sand.
570	42	570 -572	0.3	100>6	NA	0.0			Beige medium SAND, subangular to rounded, poorly sorted, little fine Sand and Silt, trace coarse sand, angular to subangular, loose, wet.
									Light brown medium SAND, subangular to subrounded, poorly sorted, some coarse Sand, subangular to subrounded, poorly sorted, little fine sand, trace silt.
575	43	575 -577	0.7	50 50>3	NA	0.0			Beige to light grey fine and medium SAND, subangular to subrounded, poorly sorted, little Silt, trace clay, with dark grey/ pale yellow laminations at 575.6'-575.7' bgs, silty fine sand engrained in matrix, soft, moist.
									Coarse to very coarse SAND, some medium Sand, little fine sand.
580	44	580 -582	0.4	100>6	NA	0.0			Light brown coarse to very coarse SAND, angular to subrounded, poorly sorted, some medium Sand, subangular to subrounded, well sorted, little granules, trace fine sand and silt, loose, wet.
							X		Coarse to very coarse SAND and GRANULES, angular to subrounded, poorly sorted, some medium Sand, subrounded to rounded, well sorted, trace fine sand, clumps of grey/white clay.
585									
590									
595									
									Dark grey CLAY, some Silt, very soft, low plasticity, medium dilatancy, wet.
600	45	600 -602	0.7	50 50>5	NA	0.0			Grey fine SAND, subangular to rounded, poorly sorted, some very fine Sand, some Silt, little grey and orange mottled clay, soft, high dilatancy, wet. Increased clay content towards 600.7' bgs.
							X		Fine to medium SAND, some coarse Sand.

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DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
605									Fine to medium SAND, some coarse Sand.
610									
615									
									Large pyrite PEBBLE, radial crystals, with dark grey clayey Silt inclusions covered with orange Sand concretion.
620	46	620 -622	0.3	75>6	NA	0.0			Dark grey CLAY, soft, medium plasticity, medium dilatancy, wet.
									Tan to brown coarse to very coarse SAND, angular to subrounded, poorly sorted, some medium Sand, subrounded to rounded, well sorted, trace fine sand and silt, loose, wet.
							X		Coarse to very coarse SAND, some medium Sand, little fine sand.
625									
									Dark grey and white medium PEBBLES and CLAY, soft, high plasticity, low dilatancy, wet.
630	47	630 -632	0.9	37 50>4	NA	0.0			Purplish grey with black/ pale yellow/orange streaked CLAY with little Silt, medium stiff, medium to high plasticity, low dilatancy, fissured, moist.
							X		Light grey to pale yellow with orange streaks very fine SAND and some SILT, little Clay, medium stiff, medium plasticity, medium dilatancy, wet.
									Coarse to very coarse SAND and GRANULES, angular to subrounded, poorly sorted, some medium Sand, subrounded to rounded, well sorted, little fine sand, clumps of grey clay.
635	48	635 -637	0.0	40 50>3	NA	0.0			White to pale brown with yellow and dark grey streaks CLAY with trace fine Sand and Silt, medium stiff, high plasticity, low dilatancy and small to large PEBBLES (Quartzite), poorly sorted.
							X		Coarse to very coarse SAND and GRANULES, some small to medium Pebbles, little medium sand, trace fine sand, some white/grey silty clay.
640	49	640 -642	0.1	100>4	NA	0.0			Light grey CLAY with trace Silt and very fine Sand, soft, high plasticity, low dilatancy and small to large PEBBLES (Quartzite), wet.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
								X		Coarse SAND, GRANULES, and PEBBLES, little to some medium Sand, trace fine sand, some clumps of white clay with trace silt.
645		50	645 -647	<0.1	90>6	NA	0.0			Small to large PEBBLES (Quartzite), subangular to rounded, poorly sorted, trace medium to coarse Sand, wet.
										Coarse SAND and GRANULES, angular to subrounded, poorly sorted, some medium Sand, subrounded to rounded, well sorted, trace fine sand.
										Medium to large PEBBLES(quartzite), subrounded .
650		51	650 -652	0.2	100>2	NA	0.0			Medium SAND, subrounded to rounded, well sorted, high sphericity and fine SAND, subrounded to rounded, well sorted, some coarse Sand, subangular to subrounded, trace silt, some white clay, loose, wet.
								X		Coarse to very coarse SAND and GRANULES, angular to subrounded, poorly sorted, some small Pebbles, some medium Sand, subrounded, well sorted, trace very fine sand and silt.
655		52	655 -657	0.3	100>5	NA	0.0			Light grey fine SAND, subrounded to rounded, well sorted, high sphericity, and SILT, some medium Sand, subangular to subrounded, well sorted, trace white/grey clay, soft, wet.
								X		Coarse GRANULES, subangular to rounded, poorly sorted, and small to medium PEBBLES (Quartzite), subangular to rounded, poorly sorted, some coarse Sand, subangular to subrounded, well sorted, little medium sand, small rust colored concretions.
660		53	660 -662	0.4	100>5	NA	0.0			Coarse GRANULES and small to large PEBBLES (Quartzite), subangular to subrounded, poorly sorted, loose, trace pale grey and reddish pink clay, soft, wet.
								X		Coarse GRAVEL and medium PEBBLES, medium, angular to subrounded, poorly sorted, some medium to coarse Sand, large clumps of white and light to dark grey silty clay, wet.
665		54	665 -667	0.8	50>6	NA	0.0			White to light grey/pinkish grey CLAY, hard, dense, high plasticity, low dilatancy, slightly fissured, trace Silt, dry.
										Medium to coarse SAND with clumps of white and red CLAY.
670		55	670 -672	0.6	50>6	NA	0.0			Grey and red CLAY, dense, very stiff, high plasticity, low dilatancy, dry.
										Coarse SAND, some Granules, little fine to medium sand, some clumps of red clay.
675		56	675 -677	0.3	50>6	NA	0.0			Grey, purple and red CLAY, very stiff, high plasticity, low dilatancy, dry.
										Coarse SAND and GRANULES, some medium Sand, some clumps of red clay.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		57	680 -682	0.6	50>6	NA	0.0			Grey with yellow, red and purple CLAY, very stiff, high plasticity, low dilatancy, highly fissured, dry.
										Medium and coarse SAND, some Granules, some clumps of grey, white and red clay.
685		58	685 -687	0.3	50>6	NA	0.0			Light grey CLAY, very stiff to hard, high plasticity, low dilatancy, slightly fissured, dry.
										Fine and medium SAND, trace coarse Sand, small clumps of red and grey clay.
690		59	690 -692	0.1	50>6	NA	0.0			Very pale brown fine SAND, subangular to subrounded, well sorted, and SILT, little very fine Sand, trace clay, soft, rapid dilatancy, wet.
										Medium and coarse SAND, little fine Sand, trace granules, some clumps of red clay.
										Light grey CLAY, soft, high plasticity, low dilatancy, moist.
695		60	695 -697	0.25	50>6	NA	0.1			Pale brown fine SAND, subrounded to rounded, well sorted, trace Silt and Clay, soft, wet.
										Medium SAND, subangular to rounded, poorly sorted, some coarse Sand, some clumps of red and grey clay.
700		61	700 -702	0.25	NA	NA	0.0			Light grey very fine to fine SAND, subangular to rounded, poorly sorted, and SILT, trace Clay, soft, rapid dilatancy.
								X		Medium SAND, little coarse Sand, trace fine sand, some clumps of grey and red clay.
705		62	706 -707	0.1	50>6	NA	0.0			Stratified layers of pale brown fine to medium SAND, subangular and subrounded, poorly sorted, and yellow/red streaked CLAY, very soft, high plasticity, low dilatancy, trace Silt.
										Grey, white, yellow and red CLAY, soft and coarse SAND, some medium Sand, trace granules.
710		63	710 -712	0.25	50>6	NA	0.0			Alternating layers of light grey Silty CLAY, medium stiff, high plasticity, low dilatancy, slightly fissured, moist and gray CLAY, medium stiff, high plasticity, low dilatancy, increased fissures, moist.
										Medium and coarse SAND, trace Granules, some clumps of red and grey clay.
										Light grey with yellow and dark purple banding CLAY, medium stiff, high plasticity, medium dilatancy, little Silt, moist.
715		64	714 -716	0.2	70>6	NA	0.0			Light brown fine to medium SAND, well sorted, rounded, loose, wet.
								X		Medium SAND, some coarse Sand, some light grey and red Clay.

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium SAND, some coarse Sand, some light grey and red Clay.
										Grey CLAY with black and yellow pockets of Organic Matter, soft, low plasticity, medium dilatancy, some Silt, wet.
720		65	720 -722	0.3	75>6	NA	0.0			Pale brown with yellow streaks medium SAND, subrounded to rounded, well sorted, little Silt, trace pockets of white, yellow, light grey, clay, soft, loose, wet.
										Medium SAND, little coarse Sand and Granules, some red, yellow and dark grey clay.
725		66	725 -727	0.5	47>6	NA	0.0			Dark grey CLAY, stiff, high plasticity, low dilatancy, fissured, dry.
										Red, dark grey and yellow CLAY and medium SAND, little coarse Sand.
										Dark grey CLAY, trace Silt, soft, high plasticity, low dilatancy, wet.
730		67	730 -732	0.6	70>6	NA	0.0			Grey with yellow streaks very fine SAND and SILT, trace Clay, firm, no plasticity, quick dilatancy, moist.
								X		Dark grey, yellow and red CLAY and medium SAND, some coarse Sand and Granules.
										Dark grey CLAY, soft, high plasticity, low dilatancy, wet.
735		68	735 -737	0.2	69>6	NA	0.0			Tan and light brown fine SAND, well sorted, rounded, little Silt, loose, wet.
										Red and light and dark grey CLAY and medium SAND, some coarse Sand and Granules.
740										Dark grey CLAY with some Silt, soft, very low plasticity, medium dilatancy, wet.
		69	740 -742	0.7	55>6	NA	0.0			Light grey very fine to fine SAND, subrounded to rounded, well sorted, and SILT with small smear of dark grey clay on bottom, soft, moist.
								X		Medium SAND, some clumps of light grey and yellow Clay.
										Pale brown and yellow very fine to fine SAND, subrounded to rounded, well sorted, some Silt.
745		70	745 -747	0.5	50>6	NA	0.0			Light grey with some dark grey streaks CLAY, medium stiff, high plasticity, low dilatancy, slightly fissured, dry.
										Red and dark grey CLAY, some medium to coarse Sand.
750		71	750 -752	0.4	75>6	NA	0.0			Pale brown with yellow and black very fine to fine SAND, subrounded to rounded, well sorted, little Silt, soft, smears of dark grey clay, soft, high plasticity, low dilatancy, wet.
								X		Dark, light and red CLAY and medium to coarse SAND.
755										

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		72	755 -757	0.3	60>6	NA	0.0			Pale grey brown with yellow and black fine SAND, rounded, well sorted and SILT, some very fine Sand, trace clay.
										Medium to coarse SAND, some light grey and yellow Clay, chards of black organic material and iron oxide concretions.
760		73	760 -762	0.3	70>6	NA	0.0			Pale grey/brown with yellow banding fine SAND, subangular to rounded, poorly sorted, and SILT, little very fine Sand, trace clay, soft, wet.
								X		Red and grey CLAY, little coarse Sand.
765										
770										
775										
780		74	780 -782	0.8	50>6	NA	0.0			Light grey medium SAND, subrounded, well sorted, some Silt and Clay, trace lignite and trace fine sand, soft, wet.
										Clumps of red and grey CLAY, little medium to coarse Sand.
785										
790		75	790 -792	0.7	50>6	NA	0.0			Light grey fine SAND, subrounded to subangular, poorly sorted, some medium Sand, subrounded and subangular, poorly sorted, little silt and clay, soft, wet.
										Clumps of grey and red CLAY, little medium to coarse Sand, trace black lignite and mica flakes.

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DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
795									Clumps of grey and red CLAY, little medium to coarse Sand, trace black lignite and mica flakes.
800	76	800 -802	0.6	30 30	NA	0.0			Light grey fine SAND, subangular to subrounded, poorly sorted, little Silt and Clay, soft, wet.
805							X		Clumps of light grey Sandy CLAY, grey CLAY and coarse SAND, some medium Sand, little fine sand, trace lignite and mica flakes.
810	77	810 -812	0.1	55>6	NA	0.0			Large pebble of PYRITE with black, hard, brittle LIGNITE inclusions, trace dark grey Clay, soft, high plasticity, trace sandy Clay, soft, very low plasticity, trace fine sand, wet.
815							X		Clumps of dark grey and red CLAY, little medium and coarse Sand, trace fine sand, trace lignite and mica flakes.
820	78	820 -822	0.4	NA	NA	0.0			Light grey and dark grey SILT, little very fine to fine Sand, subangular to subrounded, well sorted, little Clay, medium stiff, medium plasticity, medium dilatancy, moist.
825							X		Dark grey and red with black streaks CLAY, little fine to medium Sand, trace lignite and mica chards.
830	79	830 -832	0.6	80>6	NA	0.0			Light grey SILT and very fine to fine SAND, subrounded, well sorted, trace Clay, soft, non-plastic, quick dilatancy, wet.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Site Location:
Bethpage, NY

Borehole Depth: 872

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Clumps of dark grey, orange, red and yellow CLAY, some medium to coarse Sand, trace lignite and mica flakes.
835										
840		80	840 -842	0.2	50>6	NA	0.0			Light grey medium SAND, subangular to rounded, poorly sorted, and SILT, little fine Sand, subrounded to rounded, well sorted, trace clay, soft, wet.
								X		Medium SAND, little fine Sand, some clumps of white, red and dark grey clay, trace lignite and mica.
845										
850		81	850 -852	0.7	50>6	NA	0.0			Light grey fine SAND, subrounded to rounded, well sorted, and SILT, little very fine Sand, trace clay, soft, non-plastic, quick dilatancy and large mica flakes, wet.
								X		Medium to coarse SAND, subangular to rounded, little Lignite chards, trace fine sand and mica flakes, small clumps of red-orange clay.
855										
860		82	860 -862	0.2	50>6	NA	0.0			Light grey CLAY, trace Silt, soft, high plasticity, low dilatancy, clumpy, wet.
										Coarse SAND, some medium Sand and black Lignite chards, trace granules, mica flakes, clumps of grey clay.
865										Light grey SILT or CLAYSTONE (>1" rock).
		83	865 -867	0.8	33>6	NA	0.0			Dark grey CLAY, stiff, high plasticity, low dilatancy, moderate cementation, moist to dry.
										Grey and dark grey CLAY, soft, some coarse Sand and Lignite, little medium sand, trace mica flakes.

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Client: Northrop Grumman Systems Corporation

Well/Boring ID: GM-21D2

Site Location:
Bethpage, NY

Borehole Depth: 872

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
870		84	870 -872	0.2	100>0	NA	0.0			Dark grey CLAY, soft, high plasticity, low dilatancy and pulverized chunks of dark grey CLAY-CLAYSTONE, hard, brittle, strong cementation, wet.

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

X indicates analytical sample collected at that depth.

Date Start/Finish: 03/21/13-04/02/13 **Drilling Company:** Unitech **Driller's Name:** Jimmy Evans **Drilling Method:** Mud-rotary **Auger Size:** NA **Rig Type:** Mud-rotary rig **Sampling Method:** Split spoon	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 510 **Surface Elevation:** **Descriptions By:** Karla Miranda	**Well/Boring ID:** **GM-78D2** **Client:** Northrop Grumman Systems Corporation. **Location:** Bethpage, NY

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
									Hand cleared to 7' bgs.
5									
									Medium to coarse GRAVEL, Pebbles and Coarse sands.
10									
15									
20									Coarse SAND, Granules and medium to coarse Gravels, some small to medium pebbles, little to trace fine and medium sand.

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Remarks: bgs = below ground surface; NA = Not Applicable/Available.

Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: GM-78D2

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Coarse SAND, Granules and medium to coarse Gravels, some small to medium pebbles, little to trace fine and medium sand.
30										
35										
40		1	40-42	0.4	100>3	NA	0.0			Medium to large PEBBLES, trace to fine to medium Sand, trace iron deposits, wet.
										Coarse SAND, Granules and small to large Pebbles, trace fine to medium sand, little white clay, trace iron deposits.
45		2	42-60	NA	NA	NA	NA			
50										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		2	42-60	NA	NA	NA	NA			Coarse SAND, Granules and small to large Pebbles, trace fine to medium sand, little white clay, trace iron deposits.
55										
60		3	60-62	0.3	50>6	NA	0.0			Large PEBBLES.
										Medium SAND, subangular to subrounded, poorly sorted, some coarse Sand and Granules, little orange clay, wet.
65										
70		4	62-80	NA	50>6	NA	NA			
75										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		4	62-80	NA	50>6	NA	NA			Medium SAND, subangular to subrounded, poorly sorted, some coarse Sand and Granules, little orange clay, wet.
80		5	80-82	0.25	50>6	NA	0.0			Orange-brown fine to medium SAND, subangular to subrounded, poorly sorted, little Silt, trace orange clay, soft, wet.
85										Medium to coarse SAND, subangular to subrounded, poorly sorted, little Granules trace small pebbles.
90		6	82 -100	NA	NA	NA	NA			
95										
100		7	100 -102	0.3	50>5	NA	0.0			Beige to orange fine to medium SAND, angular to rounded, poorly sorted, little very fine Sand to Silt, trace orange clay, soft, wet.
		8	102 -120	NA	NA	NA	NA			Fine to medium SAND, poorly sorted, some coarse Sand and Granules, trace small pebbles, trace iron deposits.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, poorly sorted, some coarse Sand and Granules, trace small pebbles, trace iron deposits.
105										
110										
		8	102 -120	NA	NA	NA	NA			
115										
120										
		9	120 -122	0.3	50>5	NA	0.0			Orange SILT and very fine to fine SAND, little to trace orange Clay, very soft, wet.
125										
		10	122 -130	NA	NA	NA	NA			
130										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND.
135		11	130 -140	NA	NA	NA	NA			
140		12	140 -142	0.3	50>6	NA	0.0			Large PEBBLES.
										Medium SAND, little coarse Sand, trace granules, trace orange and white clay.
145										
150		13	142 -160	NA	NA	NA	NA			
155										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		13	142 -160	NA	NA	NA	NA			Medium SAND, little coarse Sand, trace granules, trace orange and white clay.
160										Large PEBBLE.
		14	160 -162	0.3	50>6	NA	0.0			Orange, gray and light brown fine to very fine SAND and SILT, yellow and orange Silty-Clay, little plasticity, quick dilatancy, soft, wet.
165										Medium and coarse SAND, trace fine Sand, Granules and Mica flakes.
170		15	162 -180	NA	NA	NA	NA			
175										
180		16	180 -182	0.3	50>5	NA	0.0			Yellowish-brown fine SAND, angular to subrounded, poorly sorted, some Silt, trace mica, soft, wet.
		17	182 -200	NA	NA	NA	NA			Medium SAND, some fine Sand, little yellow-white clay and trace granules.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: GM-78D2

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
185									Medium SAND, some fine Sand, little yellow-white clay and trace granules.
190	17	182 -200	NA	NA	NA	NA			
195									
200	18	200 -202	0.5	30 40	NA	0.1			Orange and purple grey SILT and very fine to fine SAND, subangular to subrounded, well sorted, trace orange and purple gray Clay, low plasticity, medium dilatancy, soft , wet
205	19	202 -220	NA	NA	NA	NA			Fine to medium SAND, little coarse Sand, trace orange clay.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
210										Fine to medium SAND, little coarse Sand, trace orange clay.
		19	202 -220	NA	NA	NA	NA			
215										
										Slough
220		20	220 -222	0.3	50>5	NA	0.3			Small PEBBLE layer.
										Brown to light brown fine SAND, subangular to rounded, poorly sorted, some Silt, soft, wet.
										Fine to medium SAND, little yellow and purple gray Clay.
225										
230		21	222 -240	NA	NA	NA	NA			
235										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		21	222 -240	NA	NA	NA	NA			Fine to medium SAND, little yellow and purple gray Clay.
240		22	240 -242	0.4	50>6	NA	0.1			Orange and light brown fine to medium SAND, subrounded to rounded, well sorted.
245		23	242 -260	NA	NA	NA	NA			Fine to medium SAND, little light gray Clay.
250										
255										
260										Gray CLAY, soft, wet.
		24	260 -262	0.3	50>5	NA	0.0			Orange, red brown and light brown fine to medium SAND, angular to subrounded, poorly sorted, little very fine Sand, trace silt and mica, soft, wet.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
									Fine to medium SAND, trace coarse Sand, little dark gray clay.
265									
270									
	25	262 -280	NA	NA	NA	NA			
275									
280									
	26	280 -262	0.3	50>6	NA	0.0			Light brown fine to medium SAND, subrounded to rounded, well sorted, little Silt, little white and dark gray clay, soft, wet.
									Fine to medium SAND, little dark gray Clay.
285	27	282 -300	NA	NA	NA	NA			

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Well/Boring ID: GM-78D2

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Fine to medium SAND, little dark gray Clay.
290										
		27	282 -300	NA	NA	NA	NA			
295										
										Orange sandy CLAY, loose, wet.
300		26	300 -302	0.6	50>6	NA	0.0			Gray to light brown fine SAND, subrounded to subangular, well sorted, trace light yellow-gray Clay high plasticity, slow dilatancy, soft, wet.
										Fine to medium SAND, subrounded to rounded, well sorted, trace light gray and dark gray clay.
305										
		29	302 -320	NA	50>6	NA	NA			
310										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
315	29	302 -320	NA	50>6	NA	NA			Fine to medium SAND, subrounded to rounded, well sorted, trace light gray and dark gray clay.
320	30	320 -322	0.4	50>6	NA	0.0			Light brown fine SAND, subrounded to rounded, well sorted, little to trace Silt, very soft, wet.
325	31	322 -330	NA	NA	NA	NA			Fine to medium SAND, little white-light gray Clay
330	32	330 -332	0.3	50>6	NA	0.0			Light gray fine to medium SAND, angular to subrounded, poorly sorted, little to trace Silt, trace orange and dark gray silty-clay, soft, wet.
	33	332 -335	NA	NA	NA	NA			Fine to medium SAND.
335									Pink large PEBBLES and light to dark gray and light pink clayey-SILT, low plasticity, medium dilatancy, stiff, moist.
	34	335 -337	0.5	36 41	NA	0.0			Light gray SILT and fine SAND, subangular to subrounded, well sorted, trace Clay very soft, wet.
	35	337 -340	NA	NA	NA	NA			Fine to medium SAND.
340	36	340 -342	0.6	50>6	NA	0.0			Light gray fine SAND, subrounded to rounded, well sorted, little very fine Sand and Silt, soft, wet.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		36	340 -342	0.6	50>6	NA	0.0			Light gray fine SAND, subrounded to rounded, well sorted, little very fine Sand and Silt, soft, wet.
		37	342 -345	NA	NA	NA	NA			Fine to medium SAND, some Mica.
345										Light gray fine SAND, angular to subrounded, poorly sorted, little Silt, soft, wet.
		38	345 -347	>0.8	20 25	NA	0.0			Interbedded Silty SAND and orange-yellow-black-pink CLAY, medium plasticity, slow dilatancy, soft, moist.
		39	347 -350	NA	NA	NA	NA			Fine SAND, trace medium to coarse Sand and trace light and dark gray and yellow Clay.
350		40	350 -352	0.7	35 38	NA	0.0			Light gray to brownish gray CLAY, trace silty Sand, high plasticity, slow dilatancy, stiff, moist.
		41	352 -355	NA	NA	NA	NA			Fine to medium SAND, little light gray Clay, trace mica.
355		42	355 -357	0.3	50>6	NA	0.0			Light brownish gray fine SAND, angular to rounded, poorly sorted, little Silt, trace dark gray silty-clay, low plasticity, medium dilatancy, soft, wet.
		43	357 -360	NA	NA	NA	NA			Fine to medium SAND, trace Granules, trace light gray clay.
360		44	360 -362	0.4	50>6	NA	0.0			Light brown/gray fine to medium SAND, well sorted, subrounded to rounded, little Silt, soft, wet.
365		45	362 -380	NA	NA	NA	NA			Medium to coarse SAND, trace dark gray Clay, Iron deposits and Mica.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
										Medium to coarse SAND, trace dark gray Clay, Iron deposits and Mica.
370										
		45	362 -380	NA	NA	NA	NA			
375										
380										Light brown medium SAND, subangular to subrounded, well sorted, some fine Sand, trace silt, very soft, wet.
		46	380 -382	0.4	50>6	NA	0.0			Light brown medium SAND, subangular to subrounded, well sorted, some fine Sand, little orange silt, trace light gray/ white clay, high plasticity, slow dilatancy, soft, moist.
										Medium SAND, little coarse Sand and Granules, little white-light gray clay.
385										
		47	382 -400	NA	NA	NA	NA			
390										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		47	382 -400	NA	NA	NA	NA			Medium SAND, little coarse Sand and Granules, little white-light gray clay.
395										
400		48	400 -402	0.3	50>6	NA	0.0			Light brown fine SAND, subangular to rounded, well sorted, some Silt, trace white and dark gray clay, soft wet.
										Medium SAND, some coarse Sand, little light and dark gray clay, trace mica.
405										
410		49	402 -420	NA	NA	NA	NA			
415										

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
420	50	420 -422	0.3	50>5	NA	0.0			Light brown medium SAND, subrounded to rounded, well sorted and fine SAND, Silt, trace light gray clay, high plasticity, slow dilatancy, soft, wet.
425	51	422 -440	NA	NA	NA	NA			Medium SAND, some coarse Sand, little orange and light gray clay, trace mica.
430									
435									
440	52	440 -442	0.4	50>4	NA	0.0			Light brown CLAY, trace Iron Deposits, soft, wet.
									Light brown medium SAND, subangular to rounded, poorly sorted, little fine Sand, little light brown silt, soft, wet.
445	53	442 -450	NA	NA	NA	NA			Medium SAND, some coarse Sand, little white/light gray clay, trace mica.

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Soil descriptions for the depth 0-40' bgs based on recovery from trough.

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Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		53	442 -450	NA	NA	NA	NA			Medium SAND, some coarse Sand, little white/light gray clay, trace mica.
450		54	450 -452	0.7	38 39	NA	0.0			Light gray very fine to fine SAND, subangular to rounded, poorly sorted and SILT, trace iron deposits, soft, moist.
		55	452 -455	NA	NA	NA	NA			Medium SAND, some coarse Sand, little orange and white clay, trace mica.
455		56	455 -457	0.3	75>4	NA	0.0			Purple-gray CLAY, medium plasticity, medium dilatancy, little Silt, soft moist. Orange medium SAND, subangular to rounded, poorly sorted, little fine Sand, trace light brown silt, soft, wet.
		57	457 -460	NA	NA	NA	0.0			Medium SAND, some coarse Sand, little white-beige clay.
460		58	460 -462	0.6	16 17	NA	0.0			Light brown fine SAND, subrounded to rounded, well sorted, little very fine Sand and little silt, soft, wet. Light brown/gray CLAY, high plasticity, slow dilatancy, little stiff, moist.
		59	462 -465	NA	NA	NA	NA			Medium and coarse SAND, little white and orange Clay.
465		60	465 -467	0.1	60>5	NA	0.0			Light gray CLAY, high plasticity, slow to no dilatancy, trace brown fine to medium Sand, subrounded to round, well sorted, soft, wet.
		61	467 -470	NA	NA	NA	NA	X		Medium SAND, some coarse Sand, trace fine sand, trace granules.
470		62	470 -472	0.3	75>5	NA	0.0			Light brown fine SAND, subrounded to rounded, well sorted, trace silt, soft, wet.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

ARCADIS
Infrastructure · Water · Environment · Buildings

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		63	472 -475	NA	NA	NA	NA			Fine to medium SAND, little coarse Sand, trace light gray clay.
475		64	475 -477	NA	50>5	NA	NA			NO RECOVERY
		65	477 -480	NA	NA	NA	NA			Medium SAND, some fine Sand, trace coarse sand and mica.
										Light gray CLAY, high plasticity, slow dilatancy and coarse to very coarse SAND, subrounded to rounded, little Granules, trace light brown fine to very fine sand, loose, trace orange and light gray silty-clay, soft, wet.
480		66	480 -482	0.9	31 36	NA	0.0			Light gray CLAY, high plasticity, slow dilatancy and coarse to very coarse SAND, subrounded to rounded, little Granules, trace light brown fine to very fine sand, trace fine to silty sand, loose, soft, wet.
		67	482 -485	NA	NA	NA	NA			Medium to coarse SAND, well sorted, subrounded to rounded, little to trace fine Sand, trace white and black clay.
485		68	485 -487	<0.1	80>6	NA	0.0			Gray/yellow SAND and CLAY, some Silt, low plasticity, medium dilatancy, very soft, wet.
		69	487 -490	NA	NA	NA	0.0			Medium SAND, subangular to rounded, some coarse to very coarse Sand, trace fine sand, well sorted, trace light gray-white-orange clay.
										Brown gray CLAY, high plasticity, slow dilatancy, soft, wet.
490		70	490 -492	0.4	75>6	NA	0.0			Fine SAND, well sorted, subrounded to rounded, some Silt, trace very fine sand.
		71	492 -495	NA	NA	NA	NA			Medium to coarse SAND, little white and dark gray Clay, trace very coarse sand and silty sand.
495		72	495 -497	0.3	100>6	NA	0.0			Fine SAND, well sorted, subrounded to rounded, medium to high sphericity, little Silt, trace very fine sand.
		73	497 -500	NA	NA	NA	NA			Medium to coarse SAND, little fine Sand, little dark gray to white-light gray clay.

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

ARCADIS
Infrastructure · Water · Environment · Buildings

Client: Northrop Grumman Systems Corporation.

Well/Boring ID: **GM-78D2**

Borehole Depth: 510

Site Location:
Bethpage, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
		73	497 -500	NA	NA	NA	NA			Medium to coarse SAND, little fine Sand, little dark gray to white-light gray clay.
500		74	500 -502	0.4	100>6	NA	0.0			Light brown fine SAND, subangular to rounded, well sorted, little Silt, trace medium sand, trace very fine sand, soft, wet.
		75	502 -505	NA	NA	NA	NA			Medium SAND, little coarse Sand, trace fine sand and very coarse sand and granules.
505		76	505 -507	0.3	100>5	NA	0.0			Lenses of light brown fine SAND, subangular to rounded, well sorted and SILT, little very fine Sand, little silt, trace light gray clay, very soft, wet.
		77	507 -510	NA	NA	NA	NA			Medium to coarse SAND, little very coarse Sand and white and gray Clay, trace fine sand and granules.
510										

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Infrastructure · Water · Environment · Buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available.

Soil descriptions for the depth 0-40' bgs based on recovery from trough.

X indicates analytical sample collected at that depth.

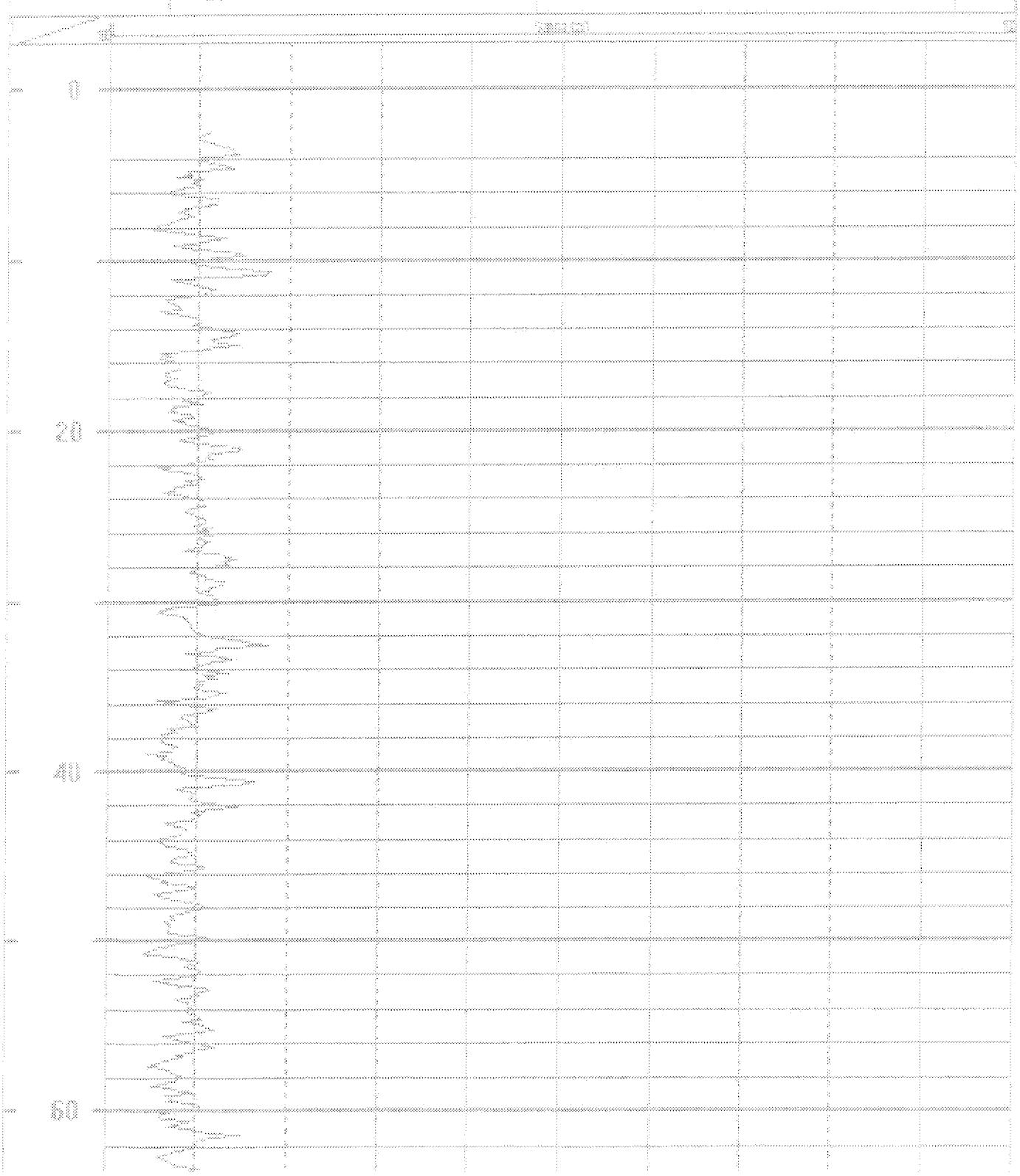
ARCADIS

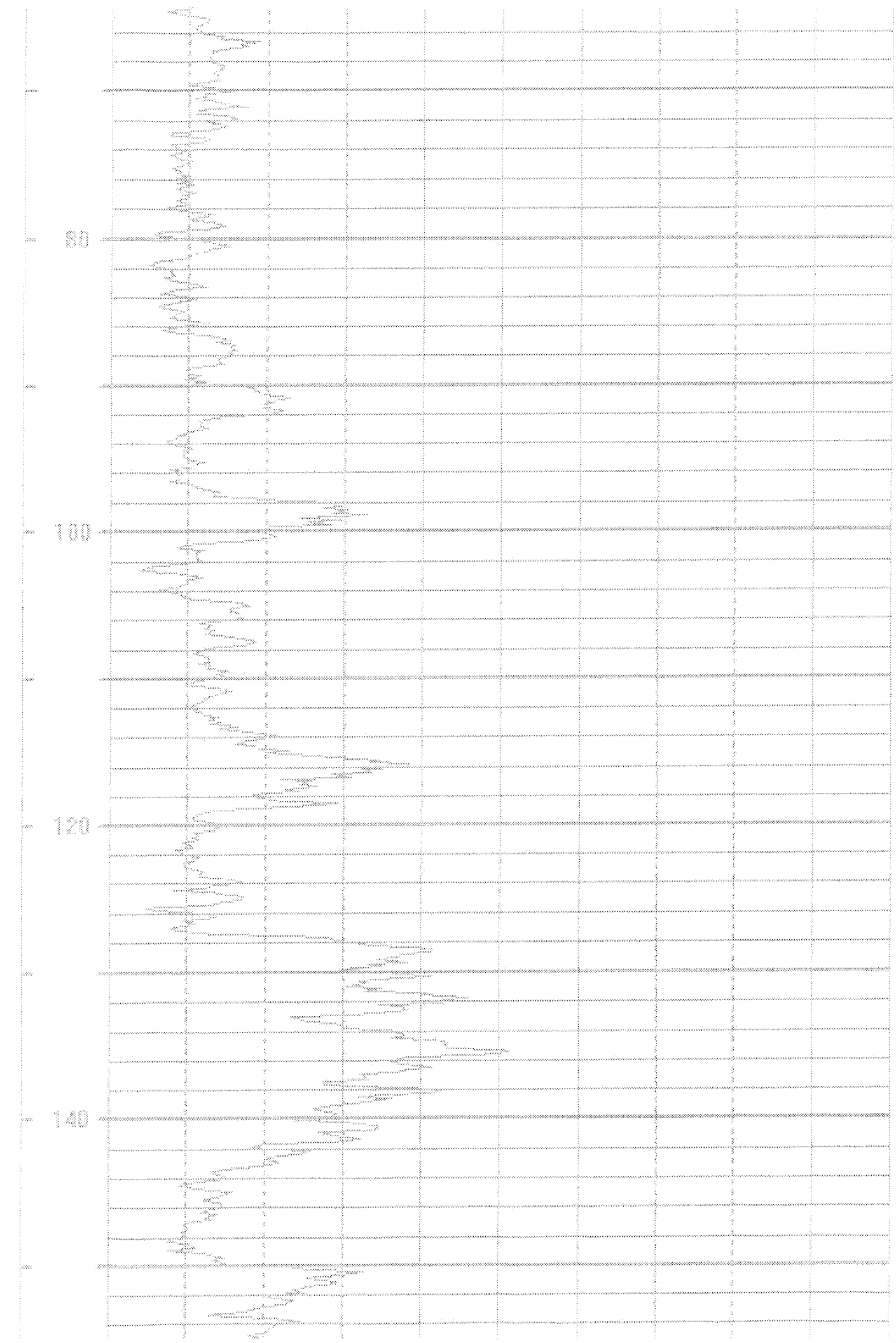
Attachment B

Geophysical Logs

COMPANY	DELTA WELL & PUMP CO., INC.
LOCATION	NGC ONCT DATA GAP

Well	VP33			Depth Driller	
				Depth Logger	
Date	03/15/2012	Bri Fluid		Logged by	CKO
File Name	75			Witness	AMBER

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120
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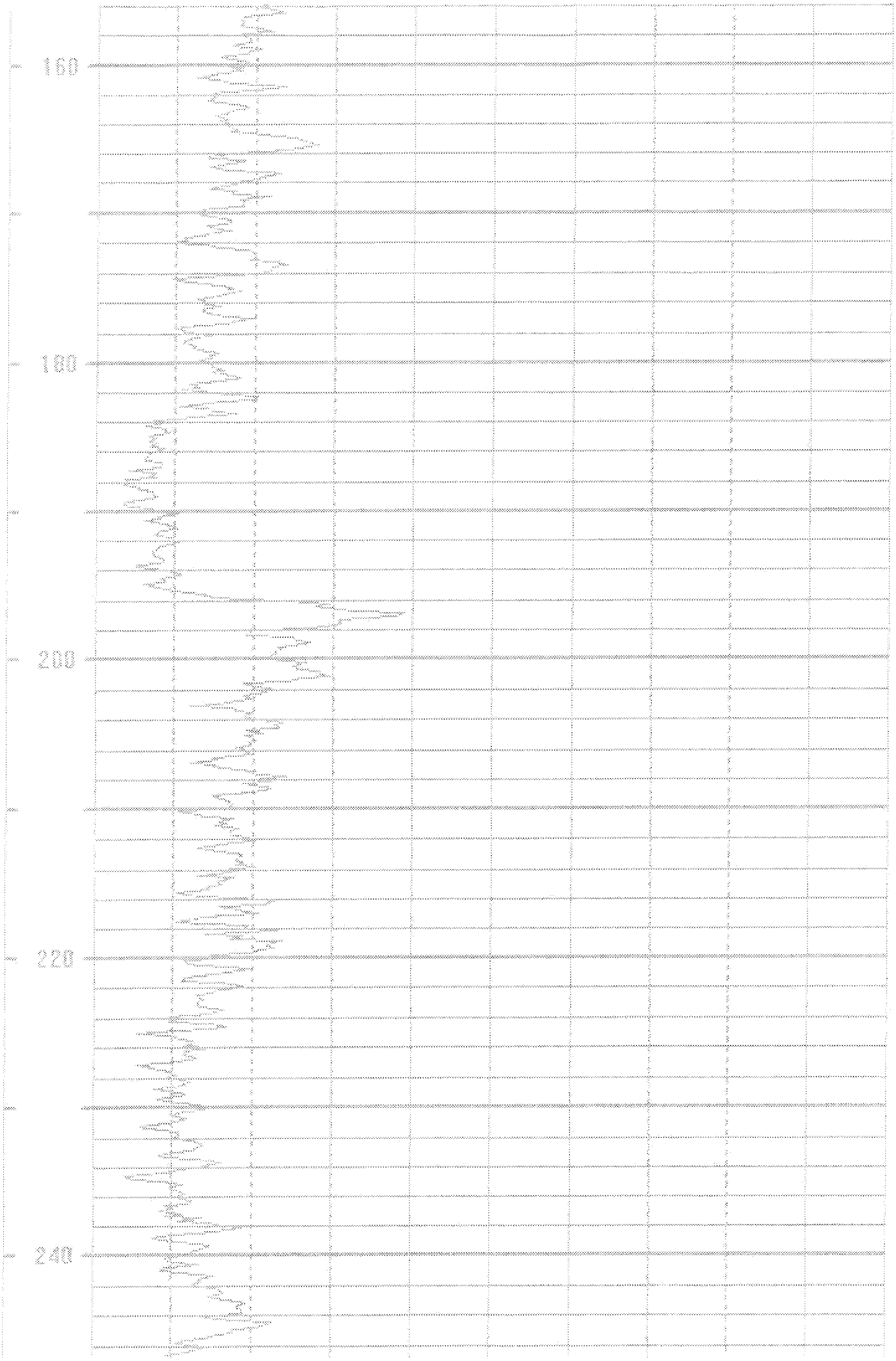
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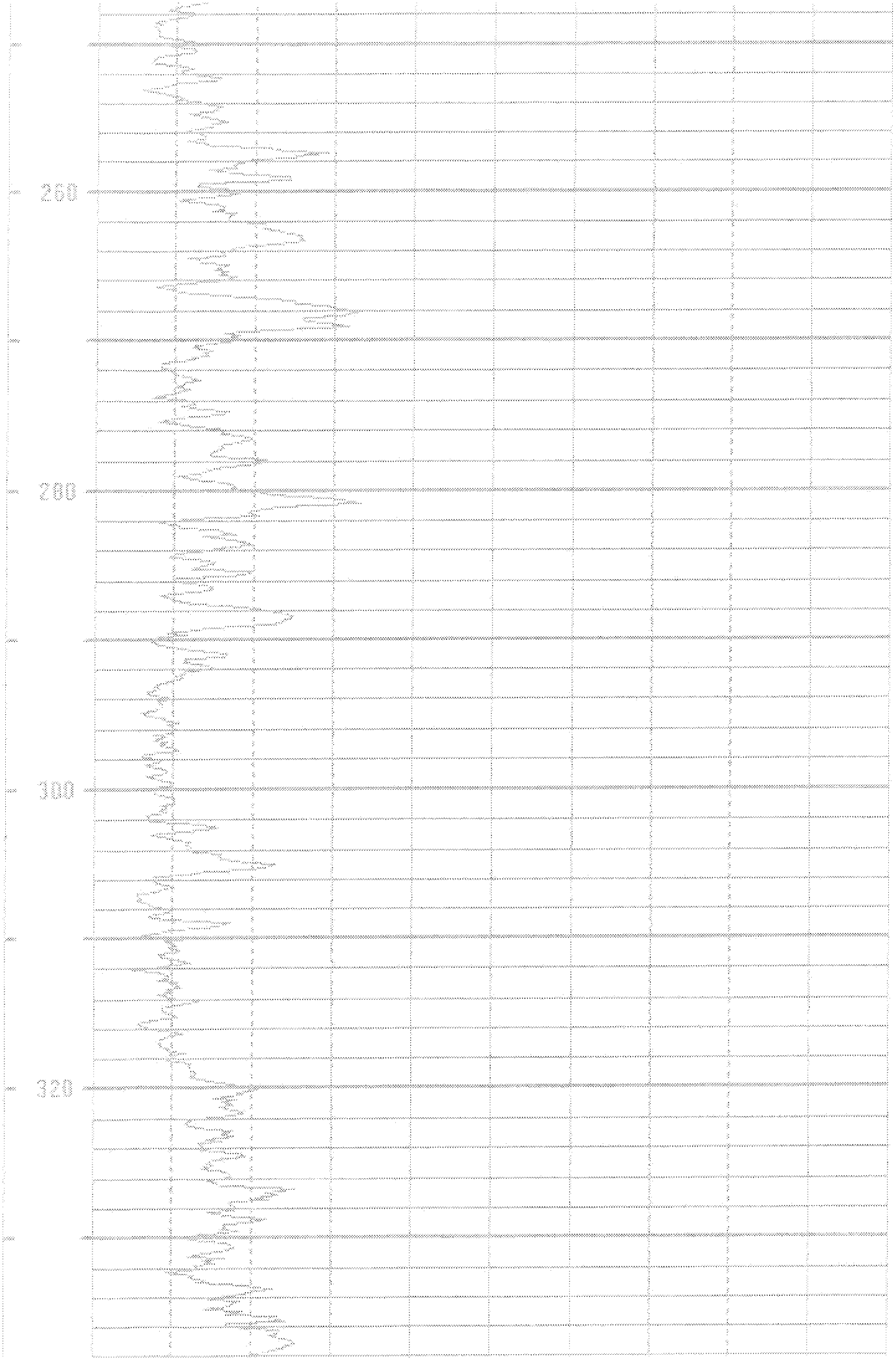
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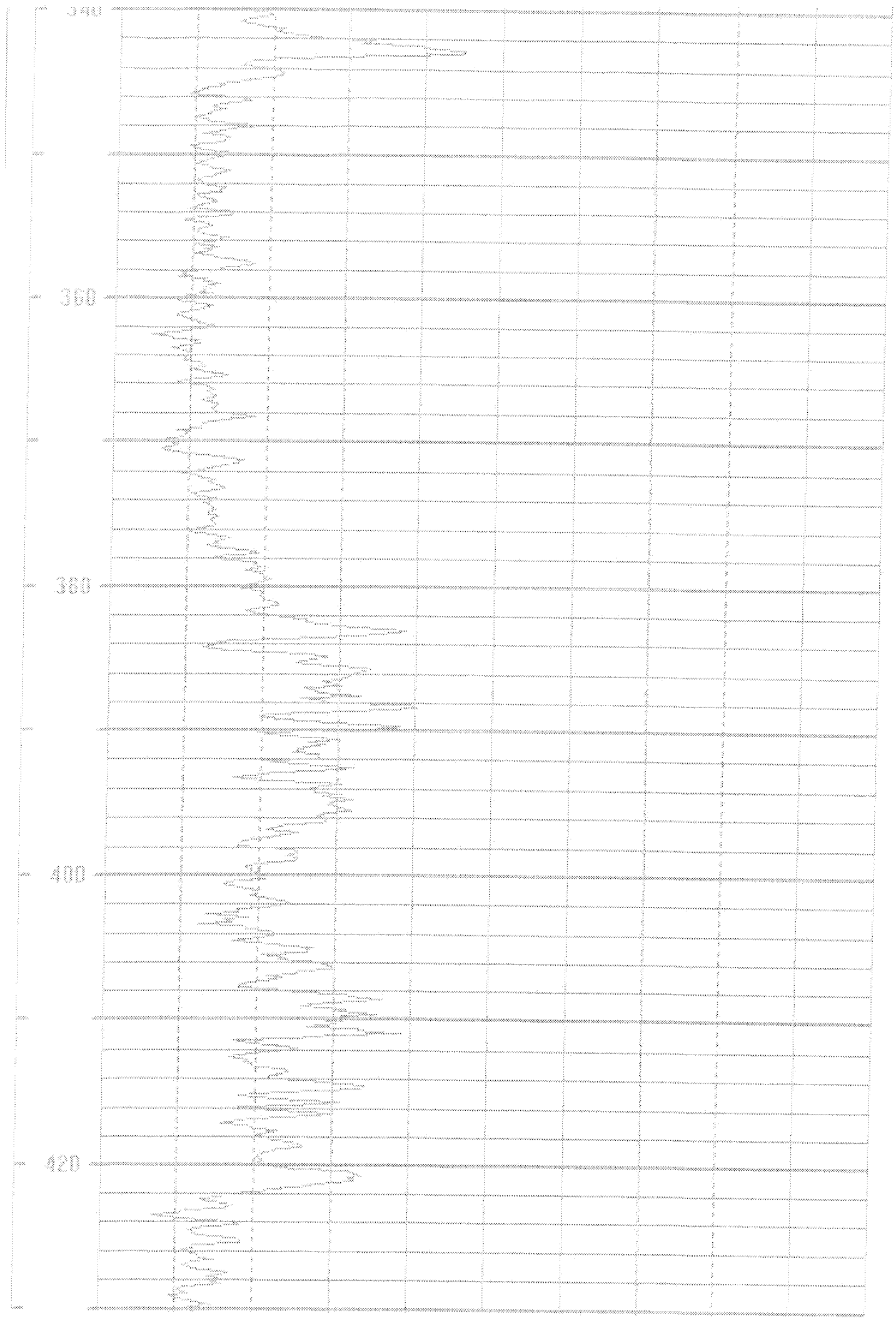
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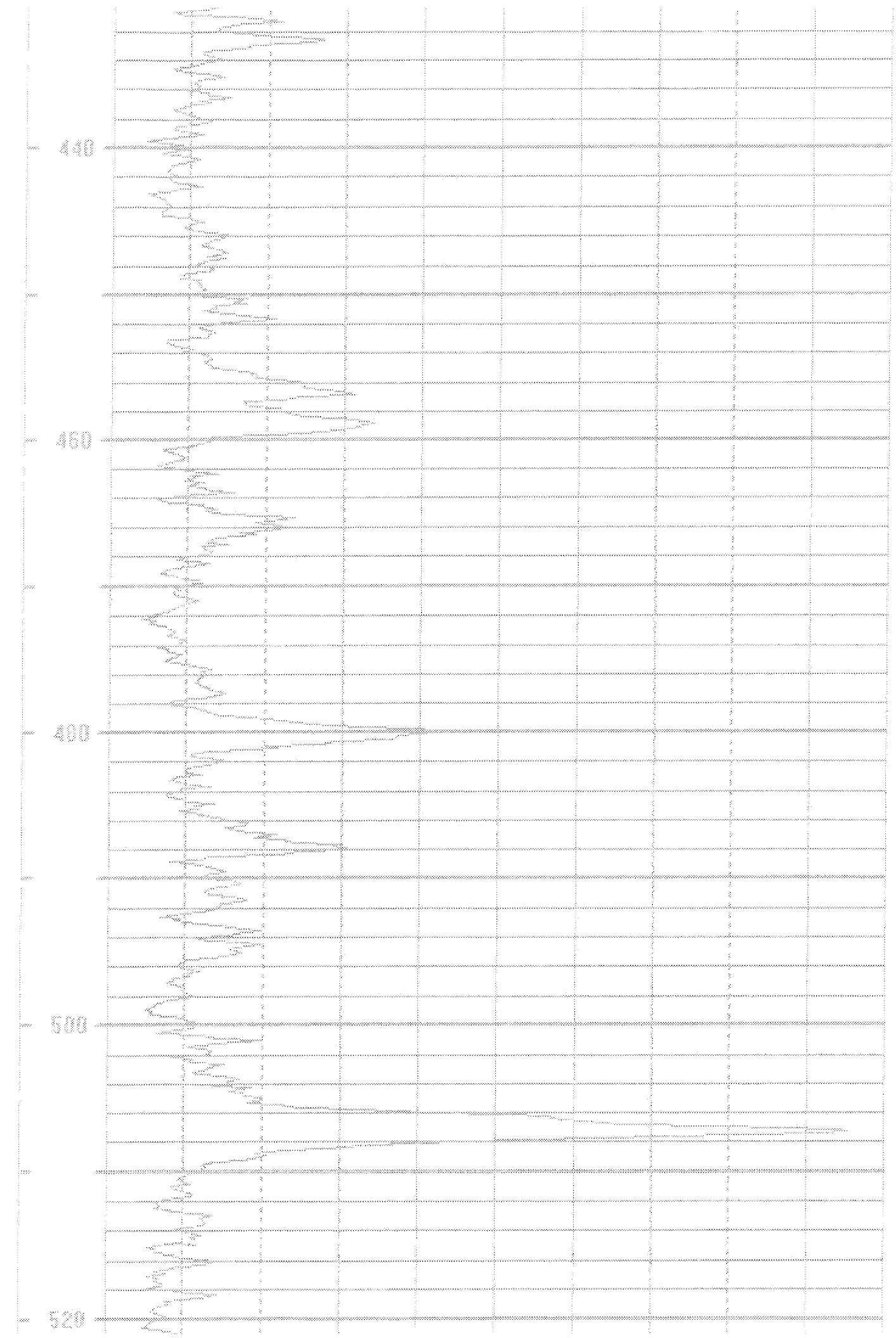
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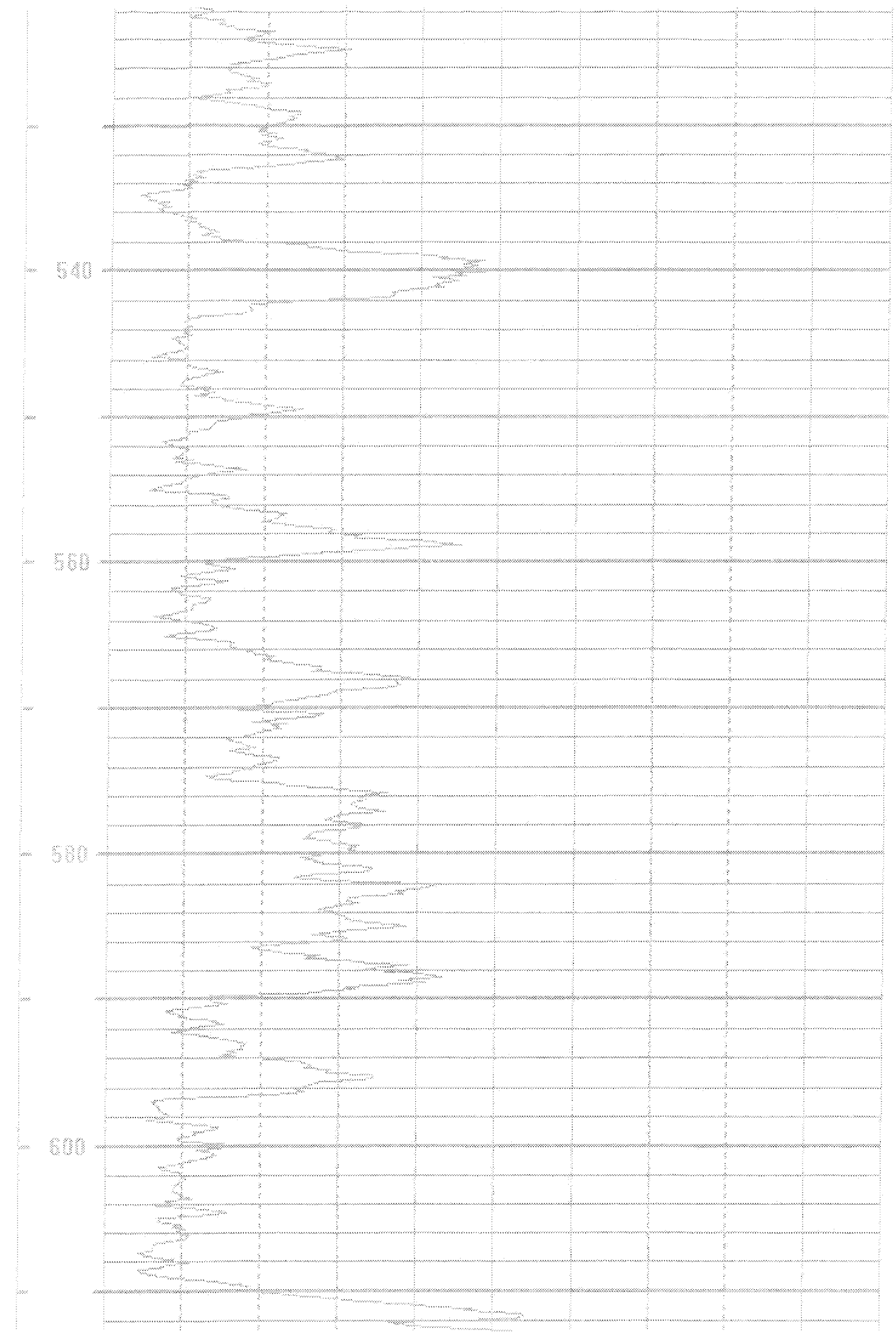
460
400
500
520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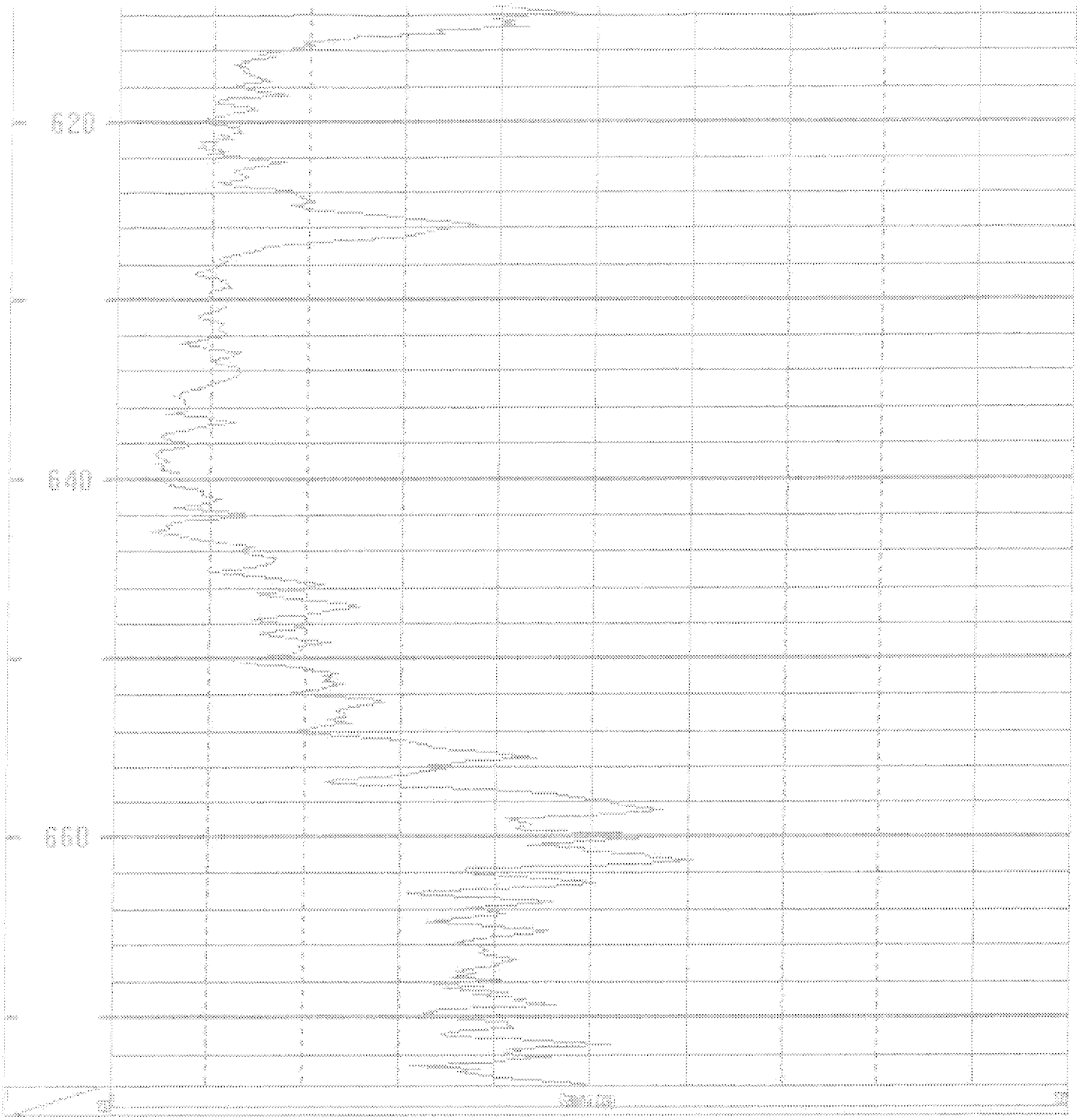
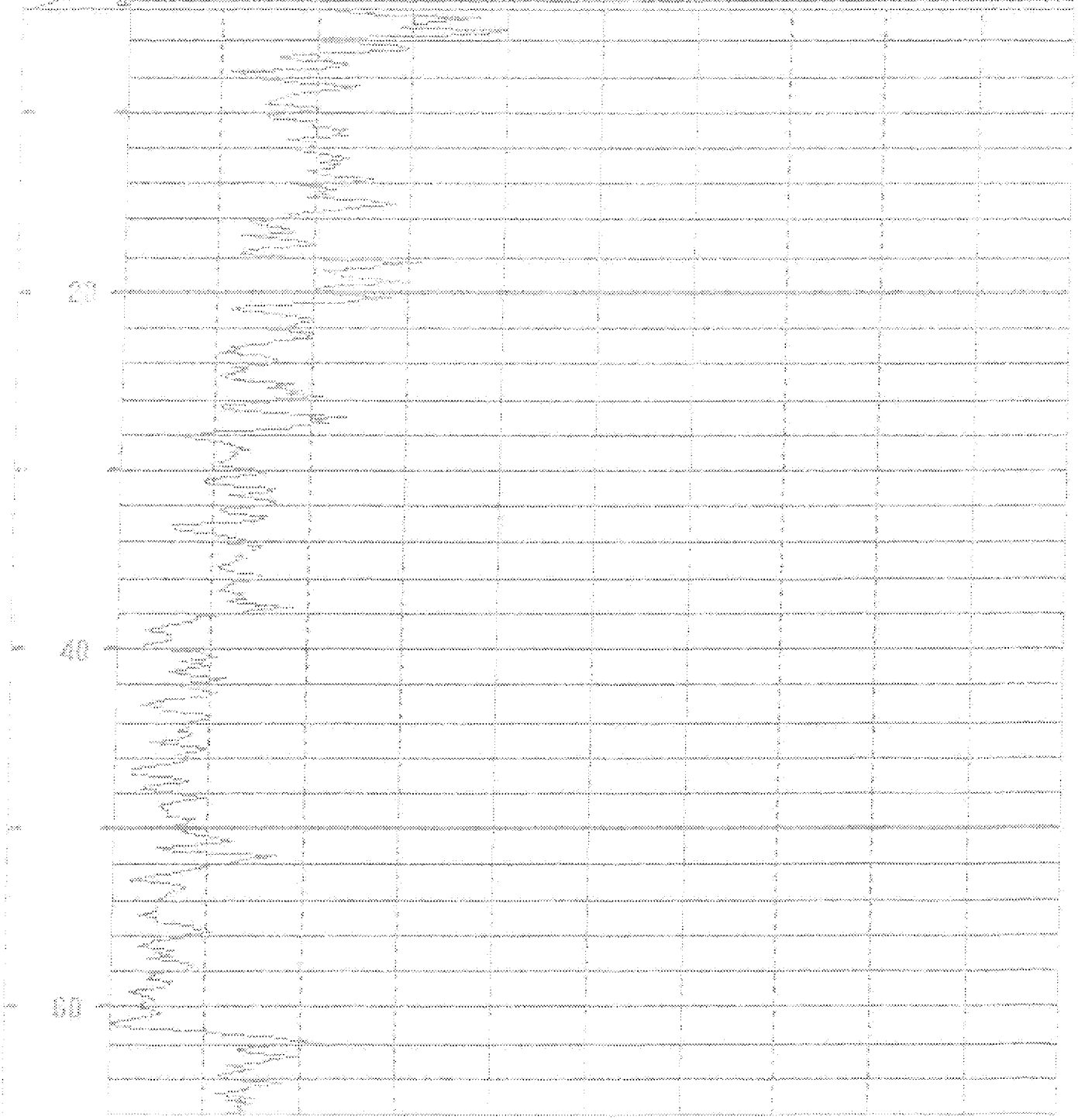
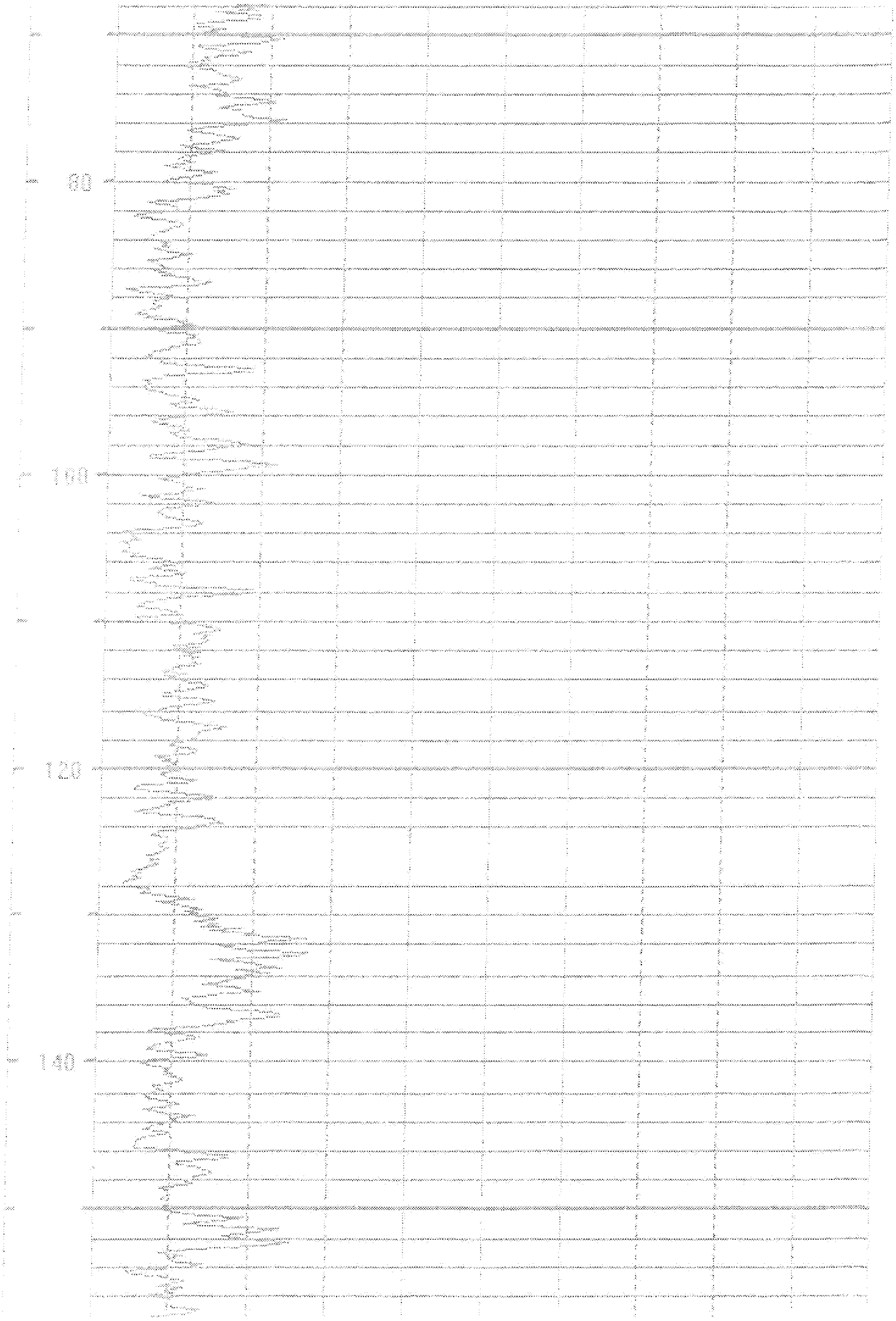

620
640
660

	COMPANY: DELTA WELL & PUMP CO., INC		Casing
	Location: NGC RW3		
Well	VP-3R	Depth Driller	
		Depth Logger	
Date	09/28/12	BH Fluid	Logged by: CMO
File Name	724		Witness: DAVE

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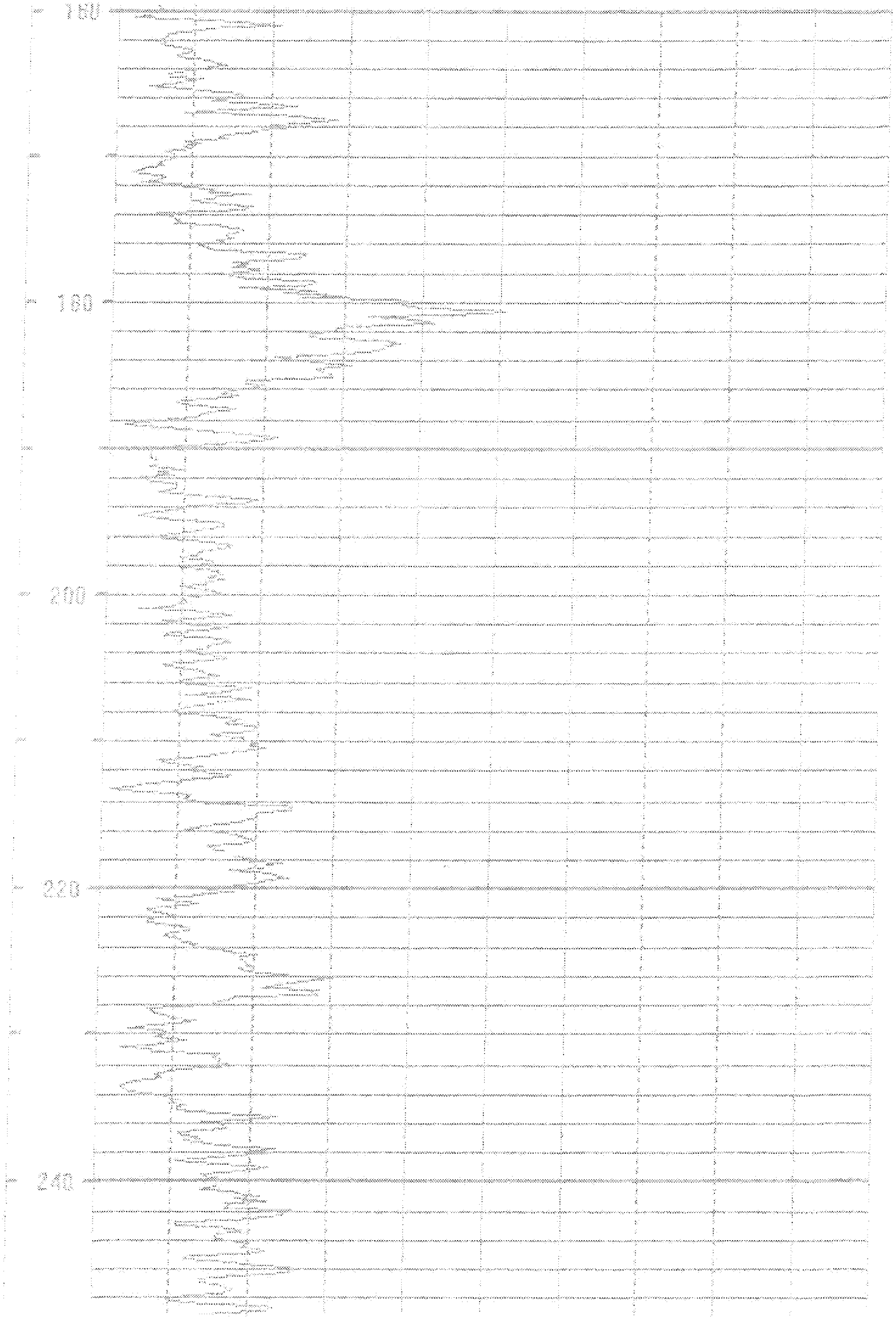
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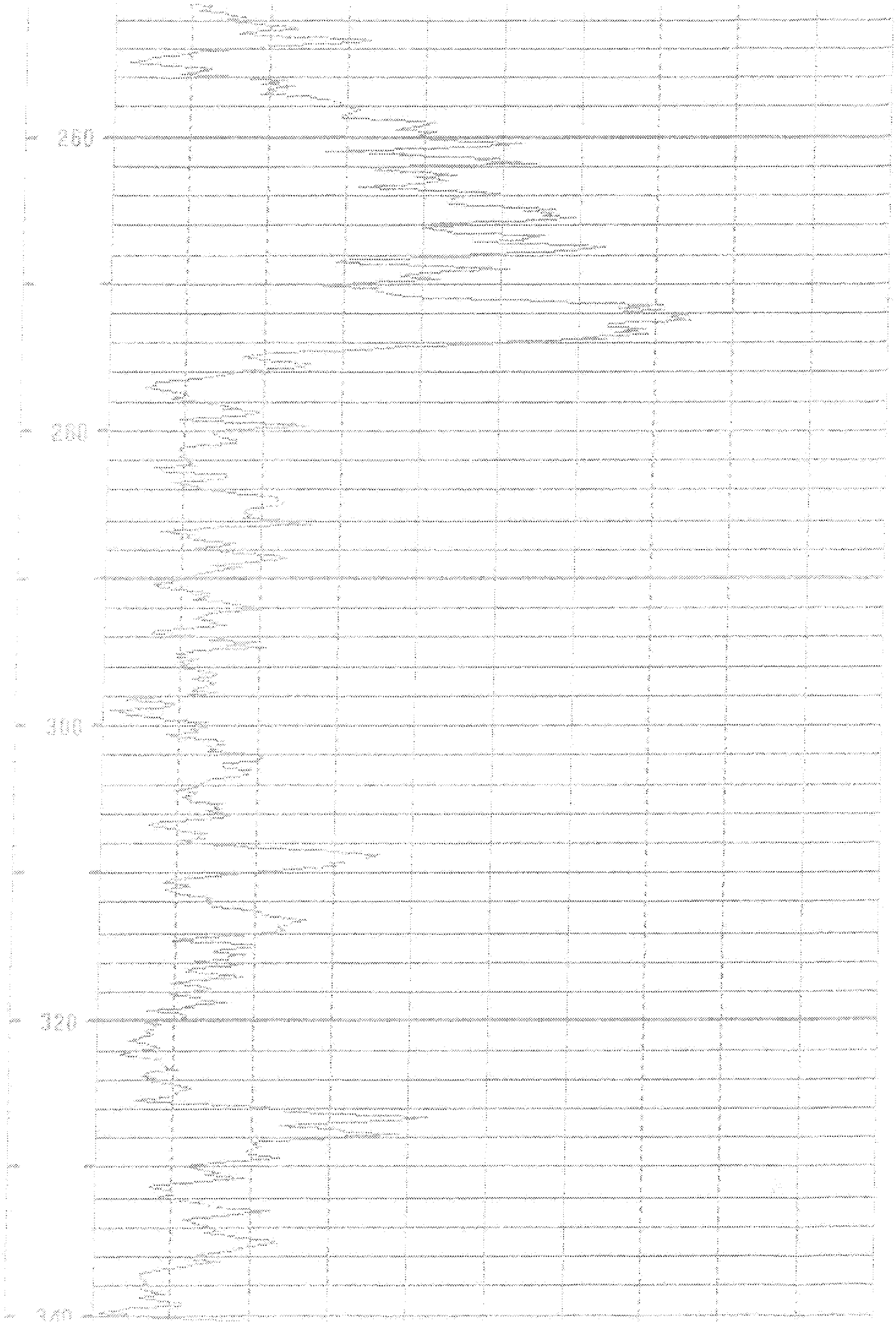
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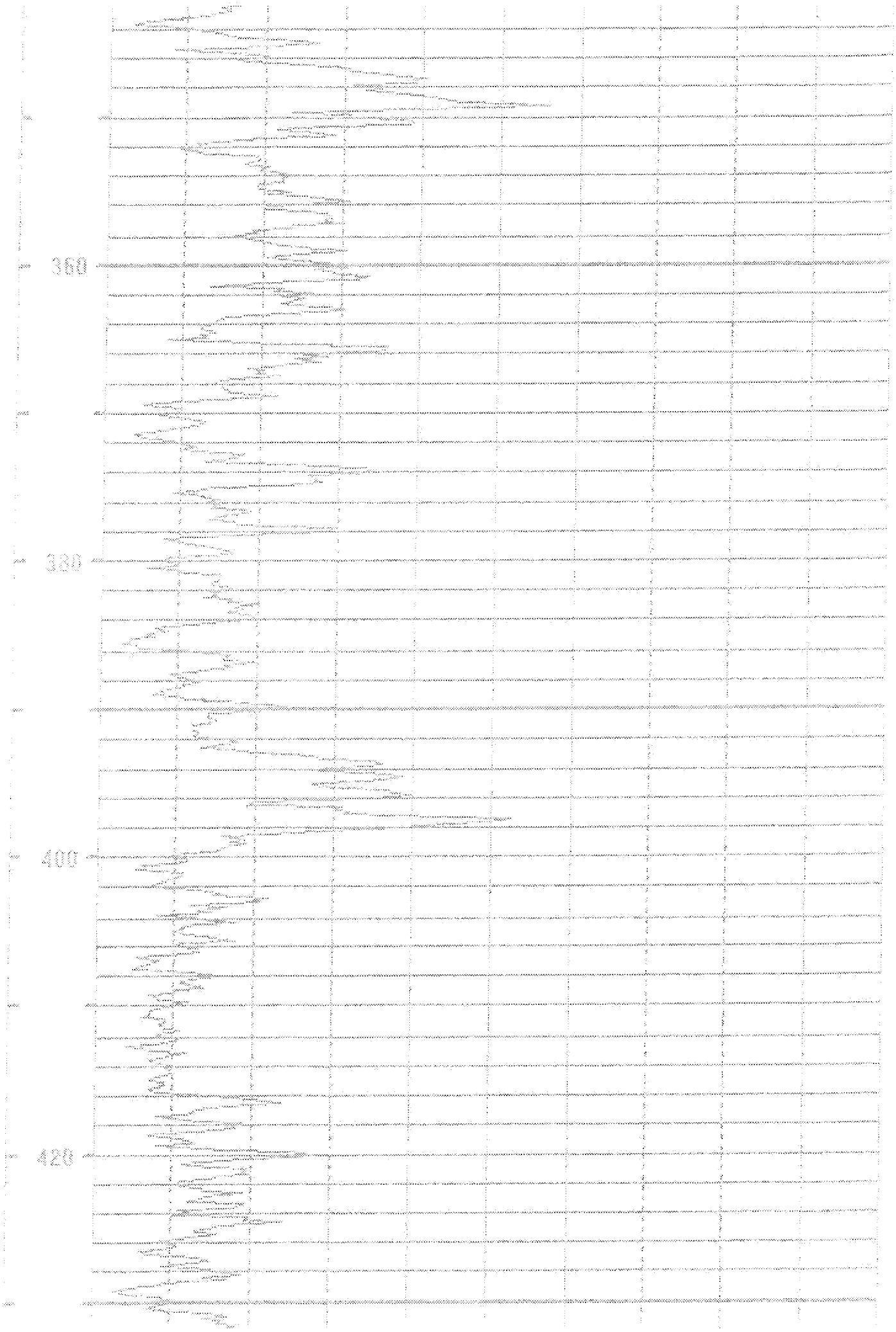
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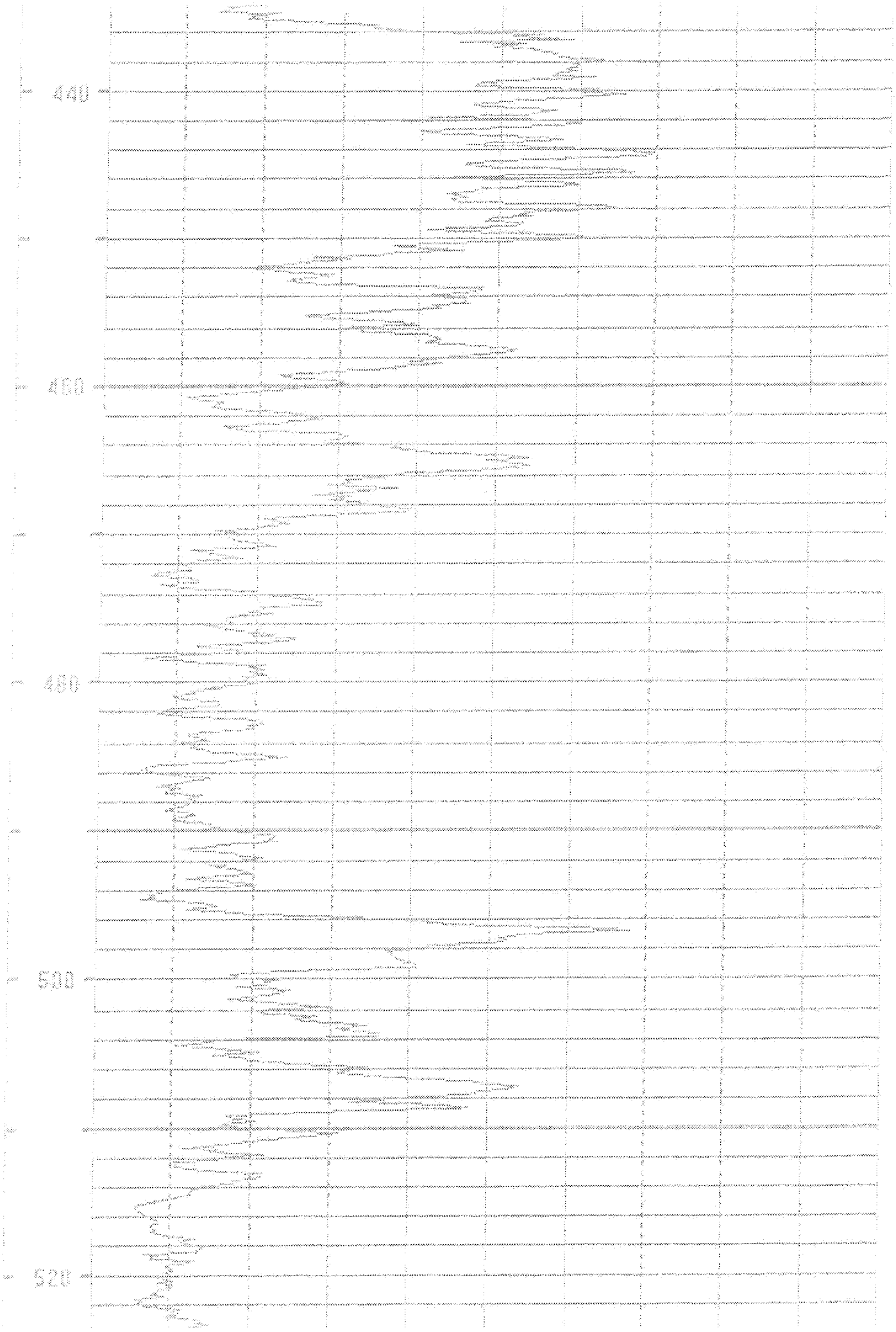
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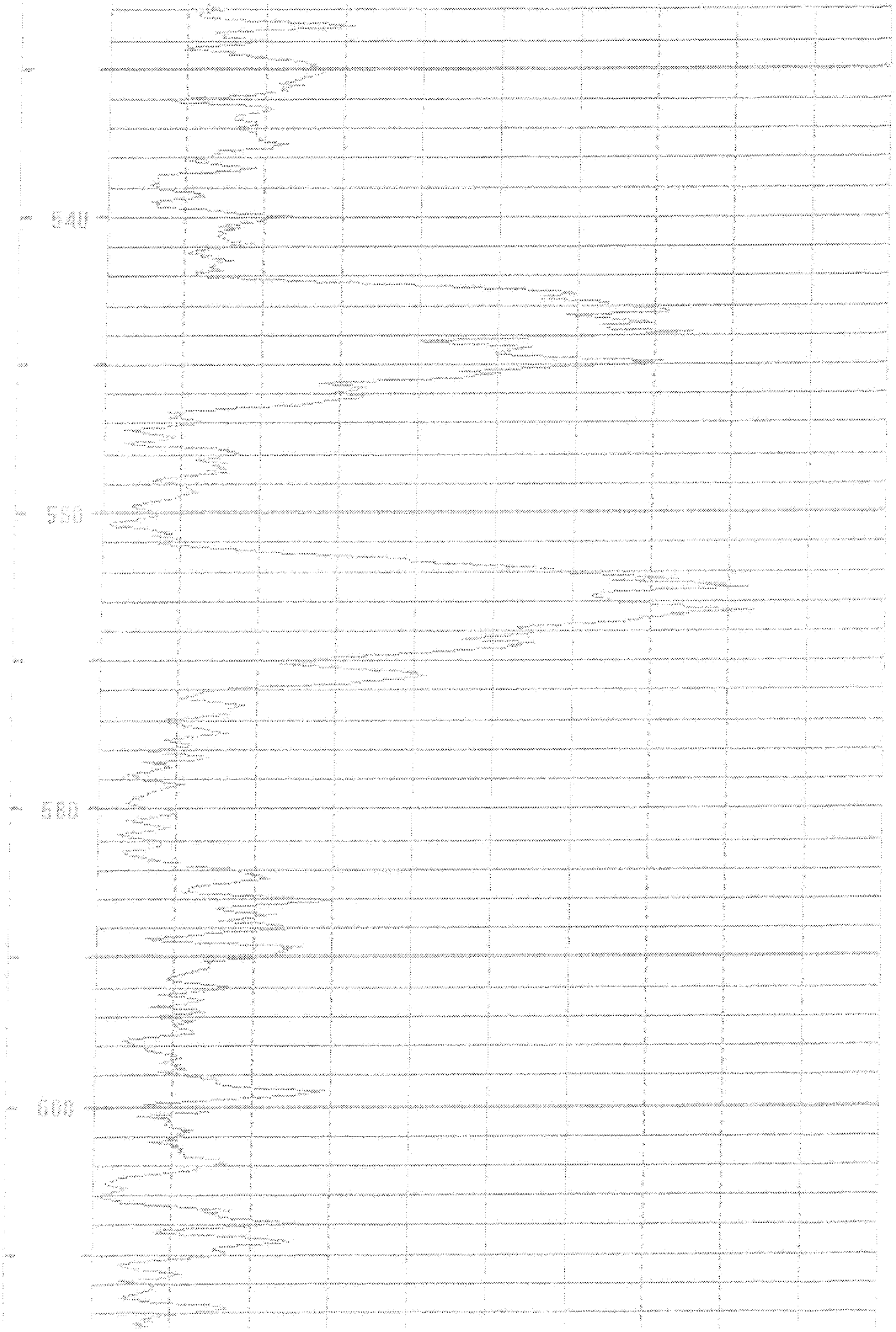
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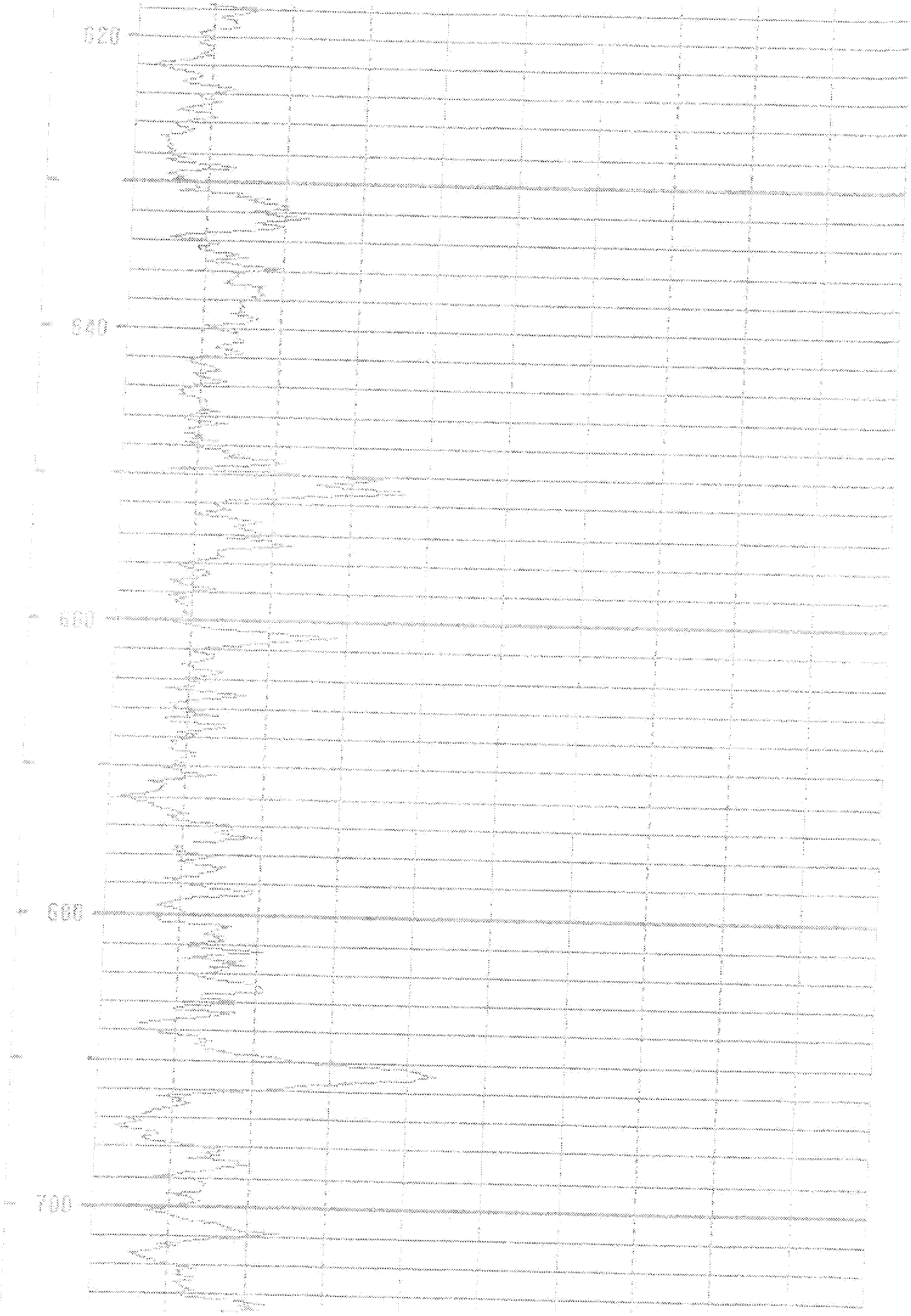
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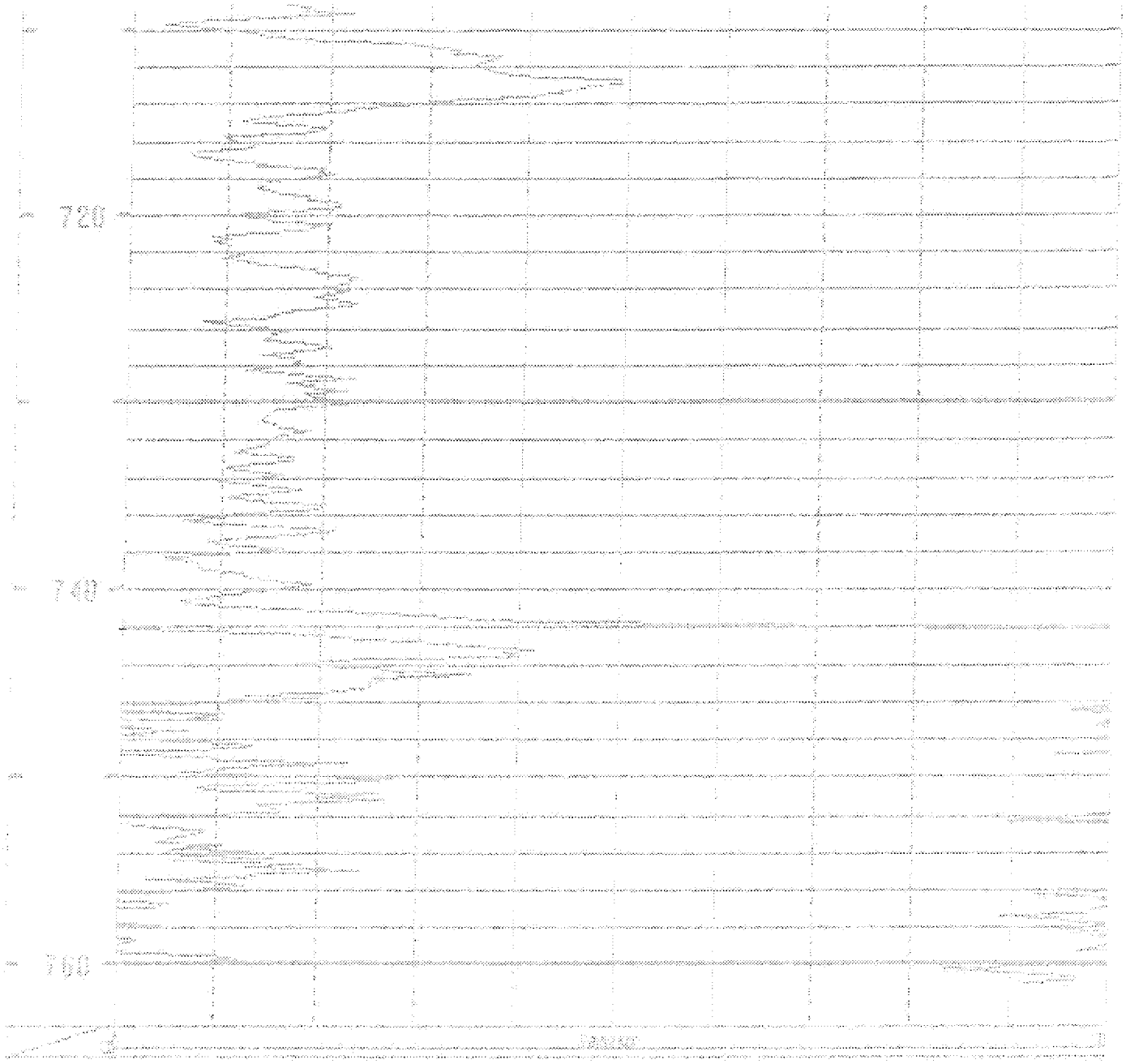
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740
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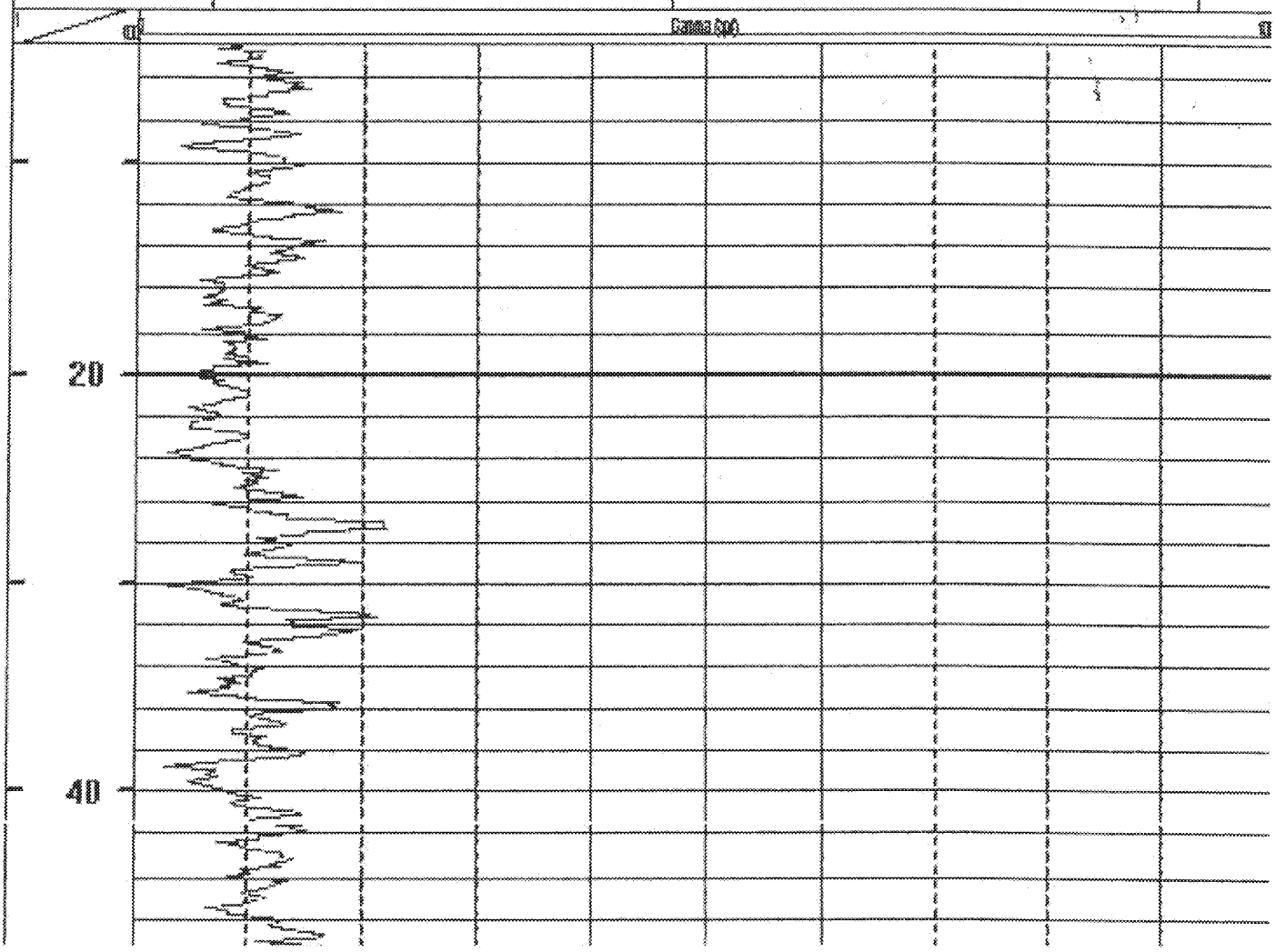
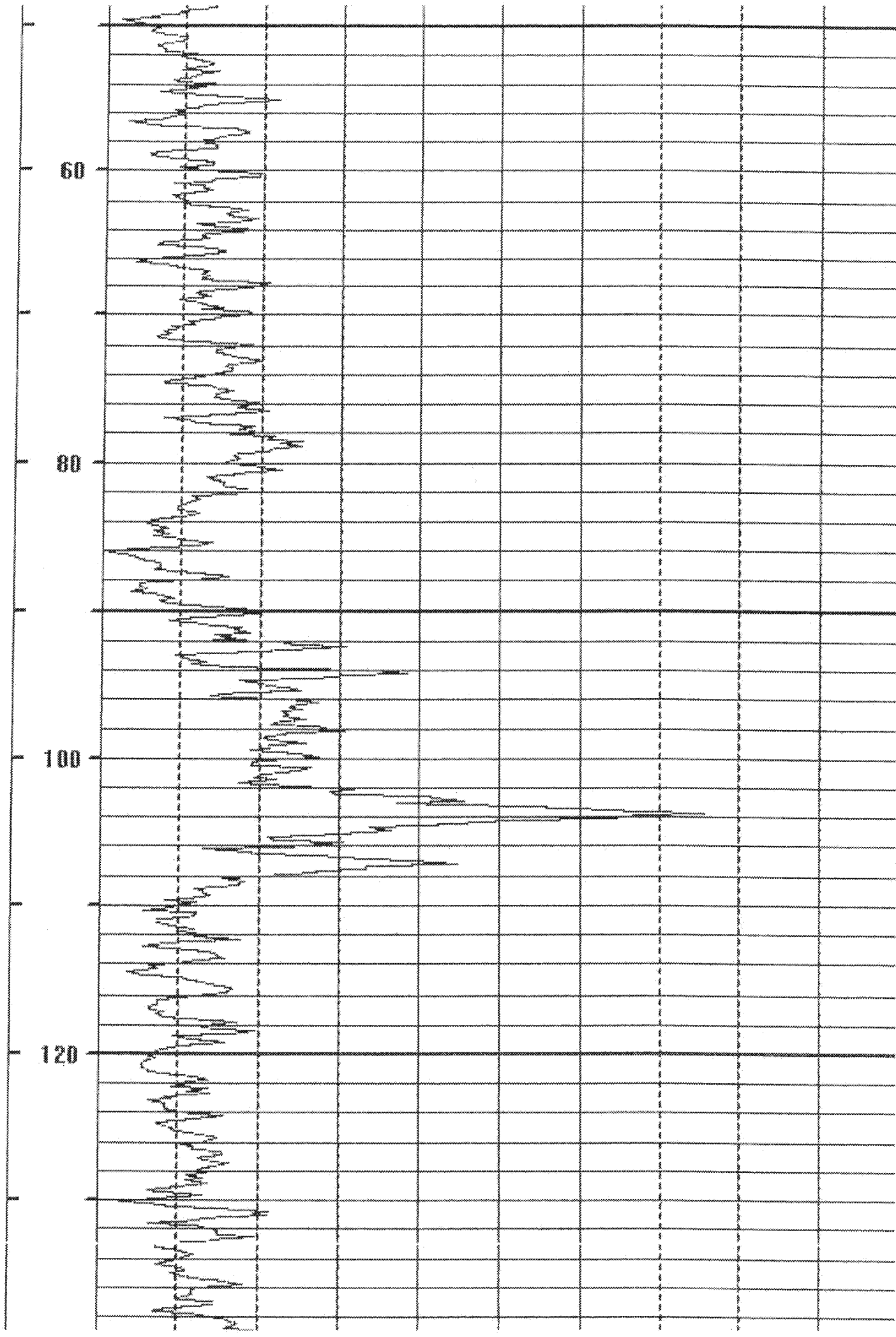
Date: Monday, January 16, 2012 Time: 15:20 File: C:\Documents and Settings\Administrator\My Documents\725\VP73Rup.rd

	COMPANY: DELTA WELL & PUMP CO., INC.			Casing
	Location: NGC ONCT DATA GAP			
Well	VP-73R		Depth Driller	
			Depth Logger	
Date	01/16/12	BH Fluid	Logged by: cmo	
File Name	725		Witness: chris	

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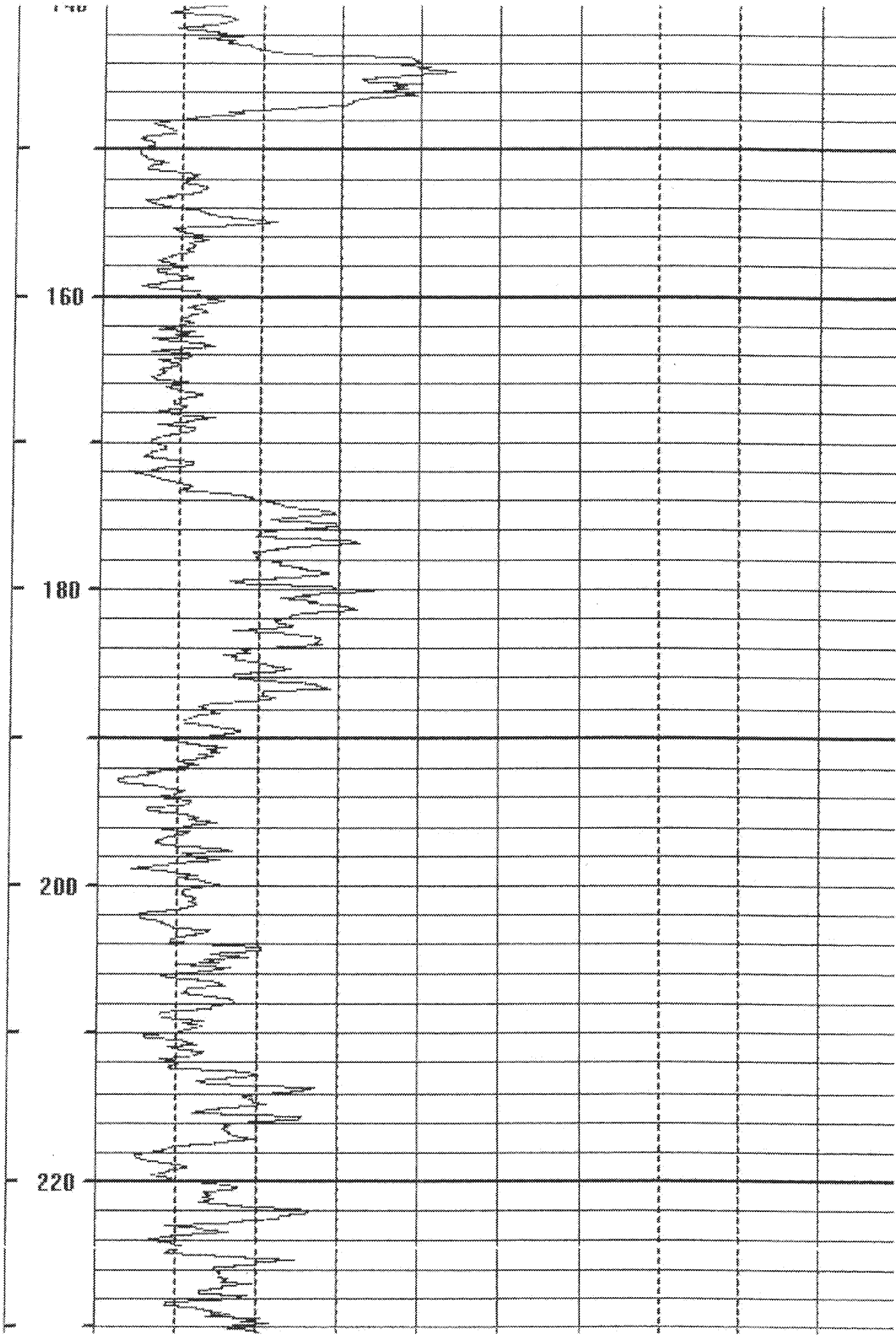
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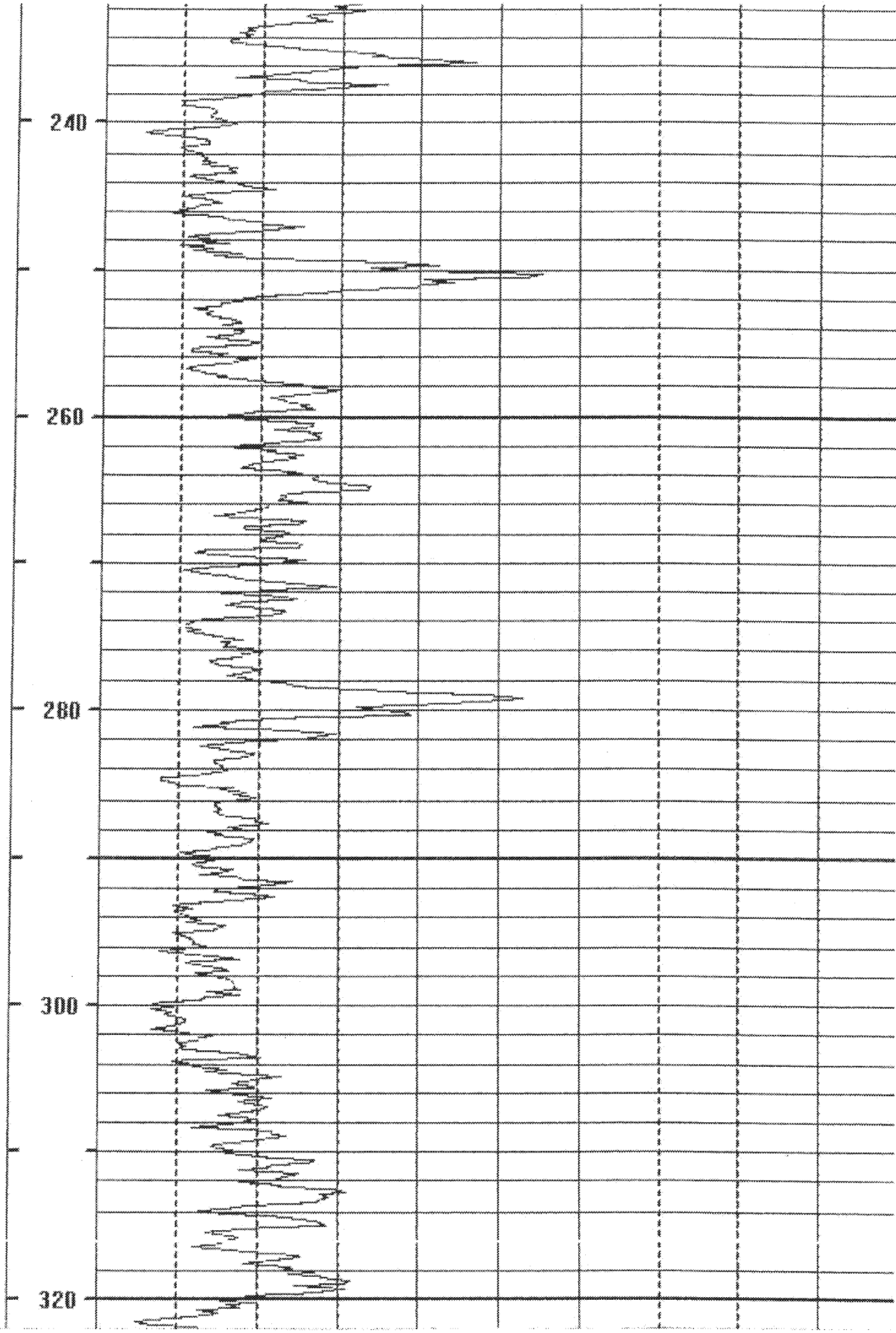
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300
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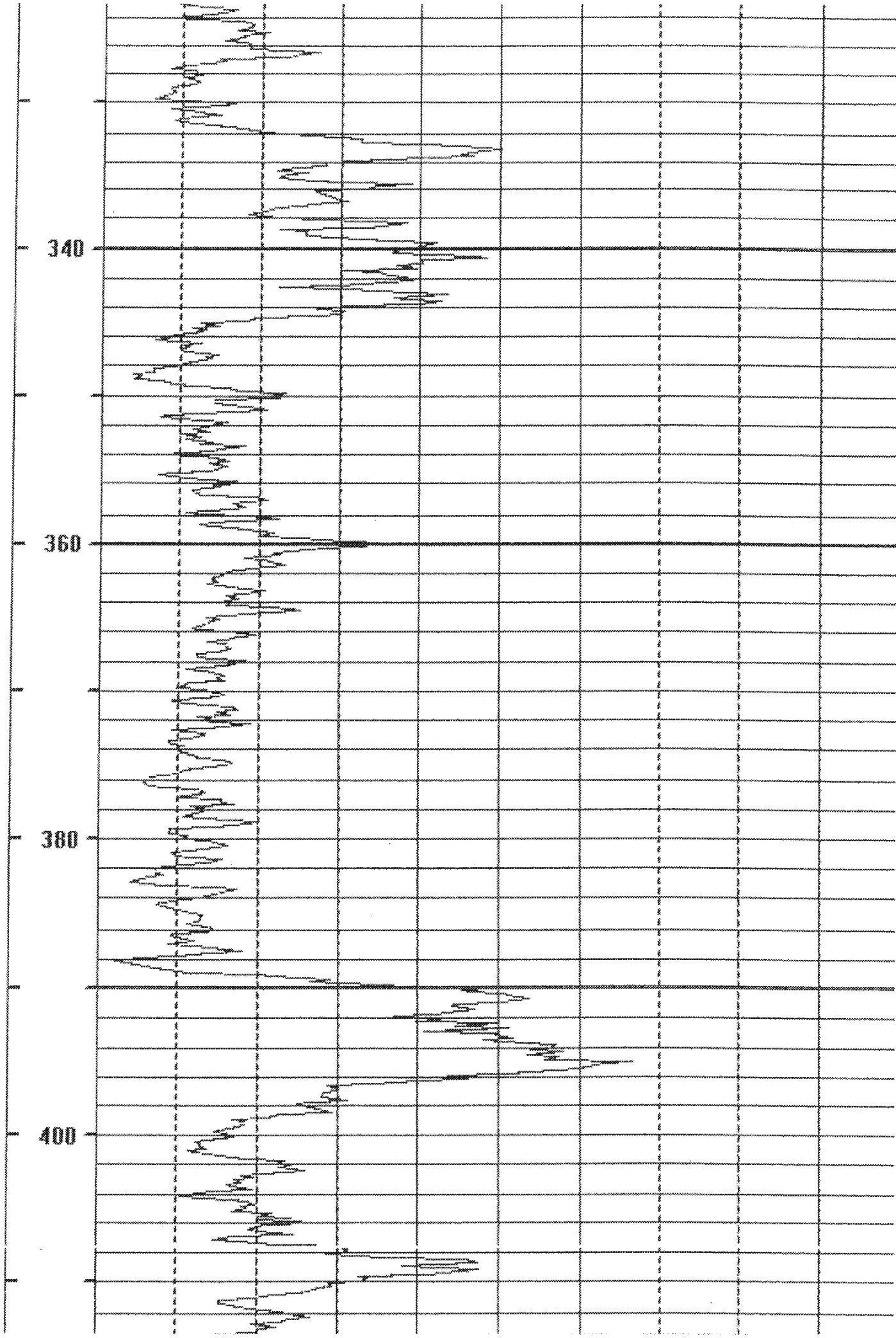
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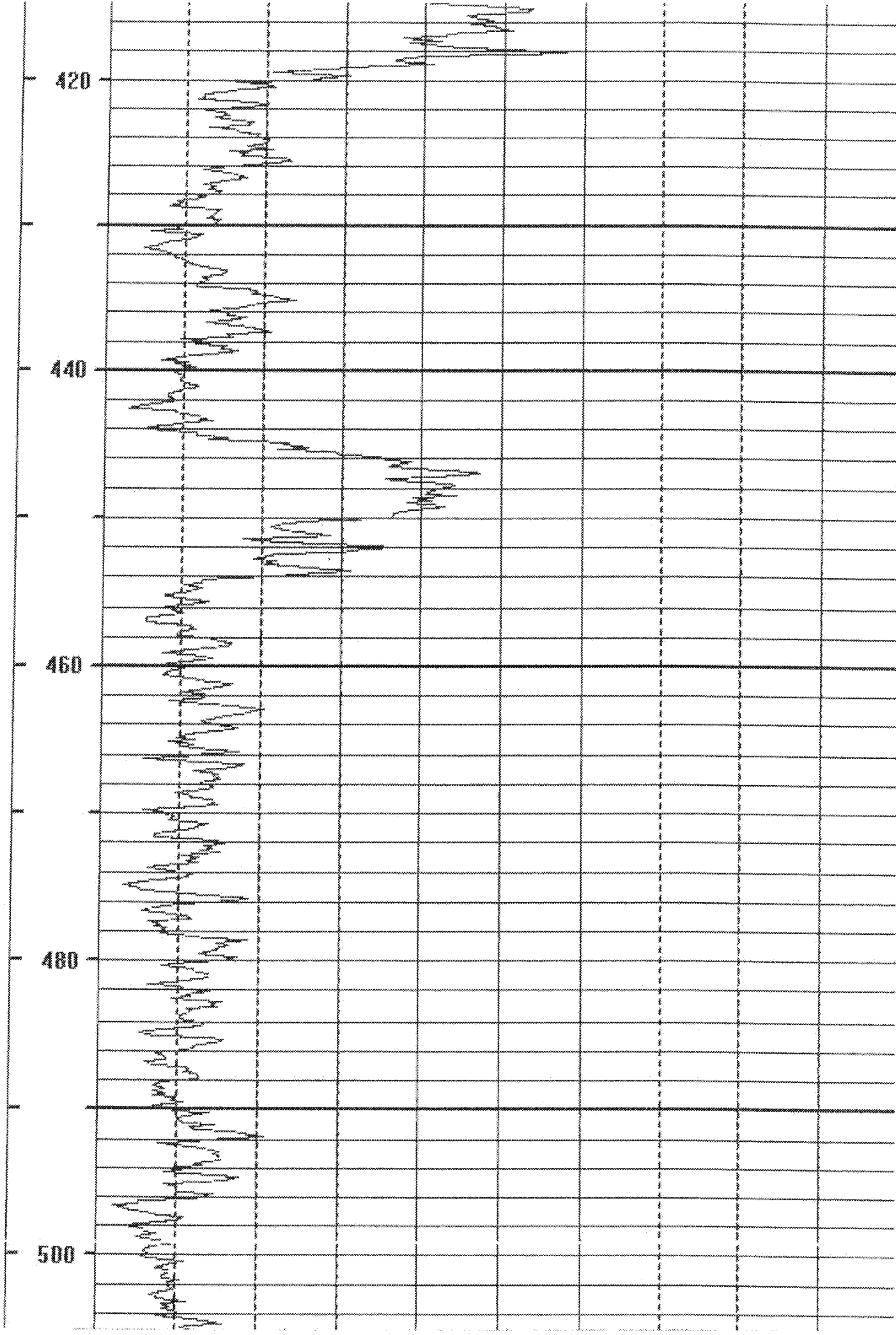
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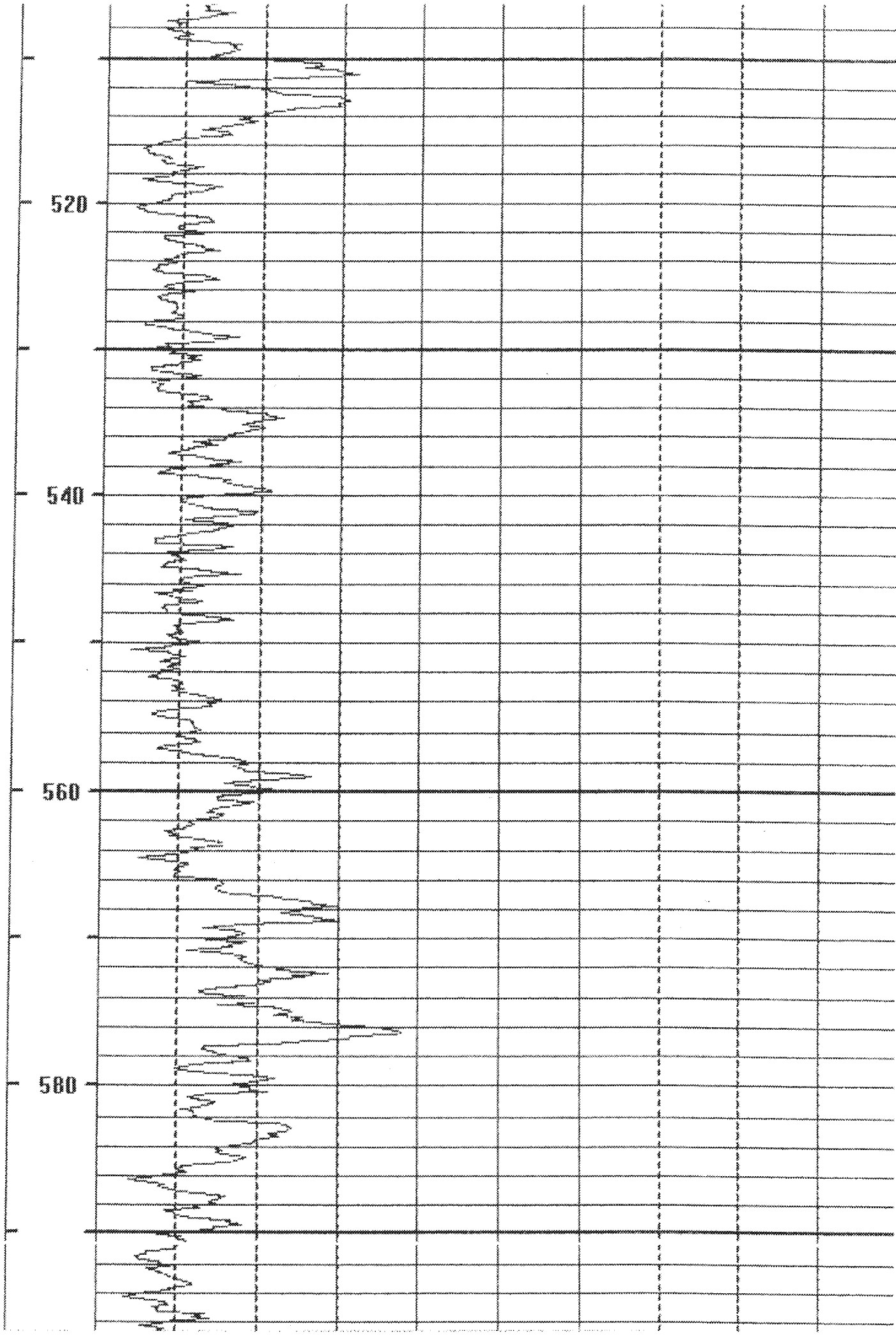
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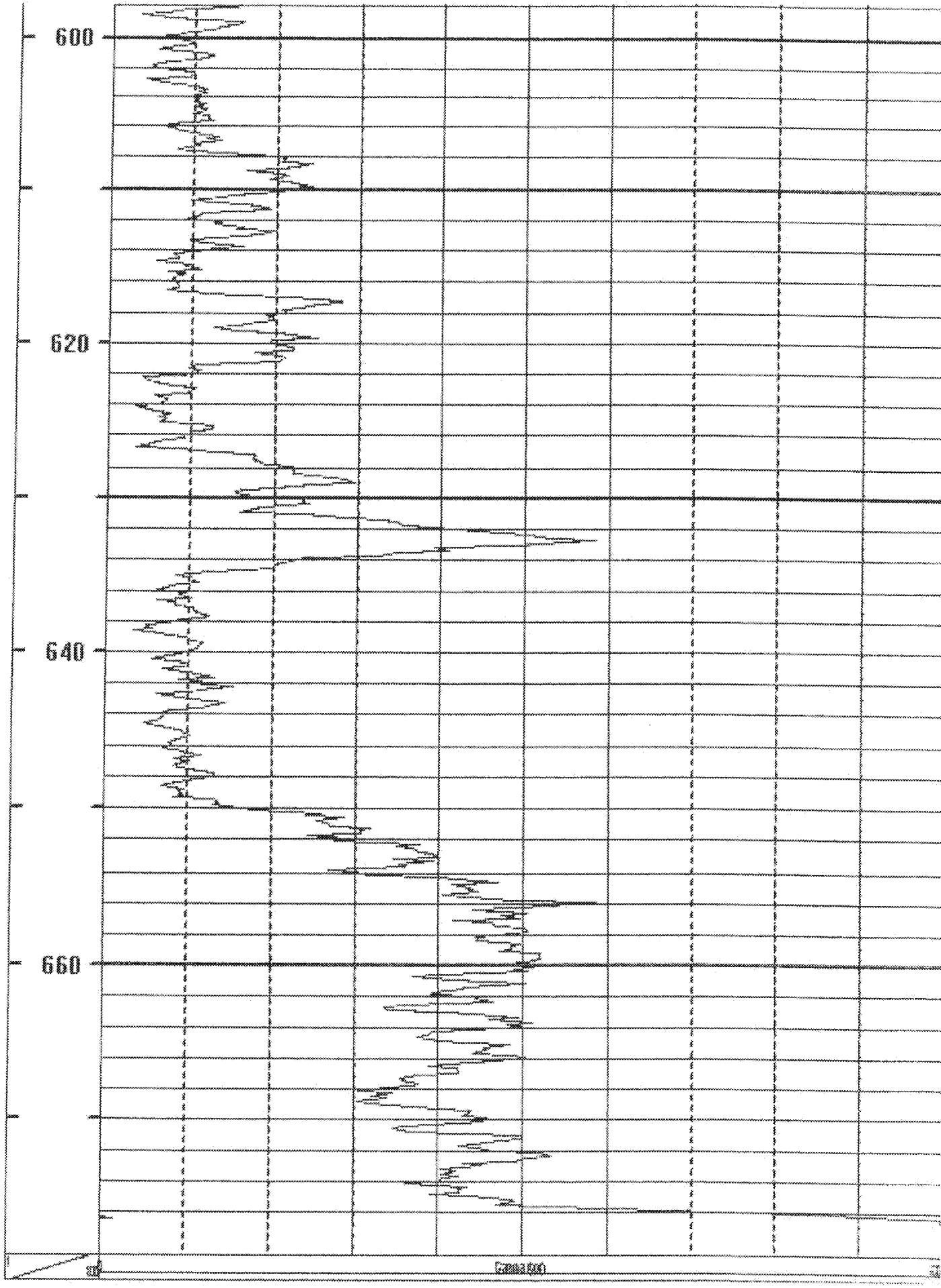

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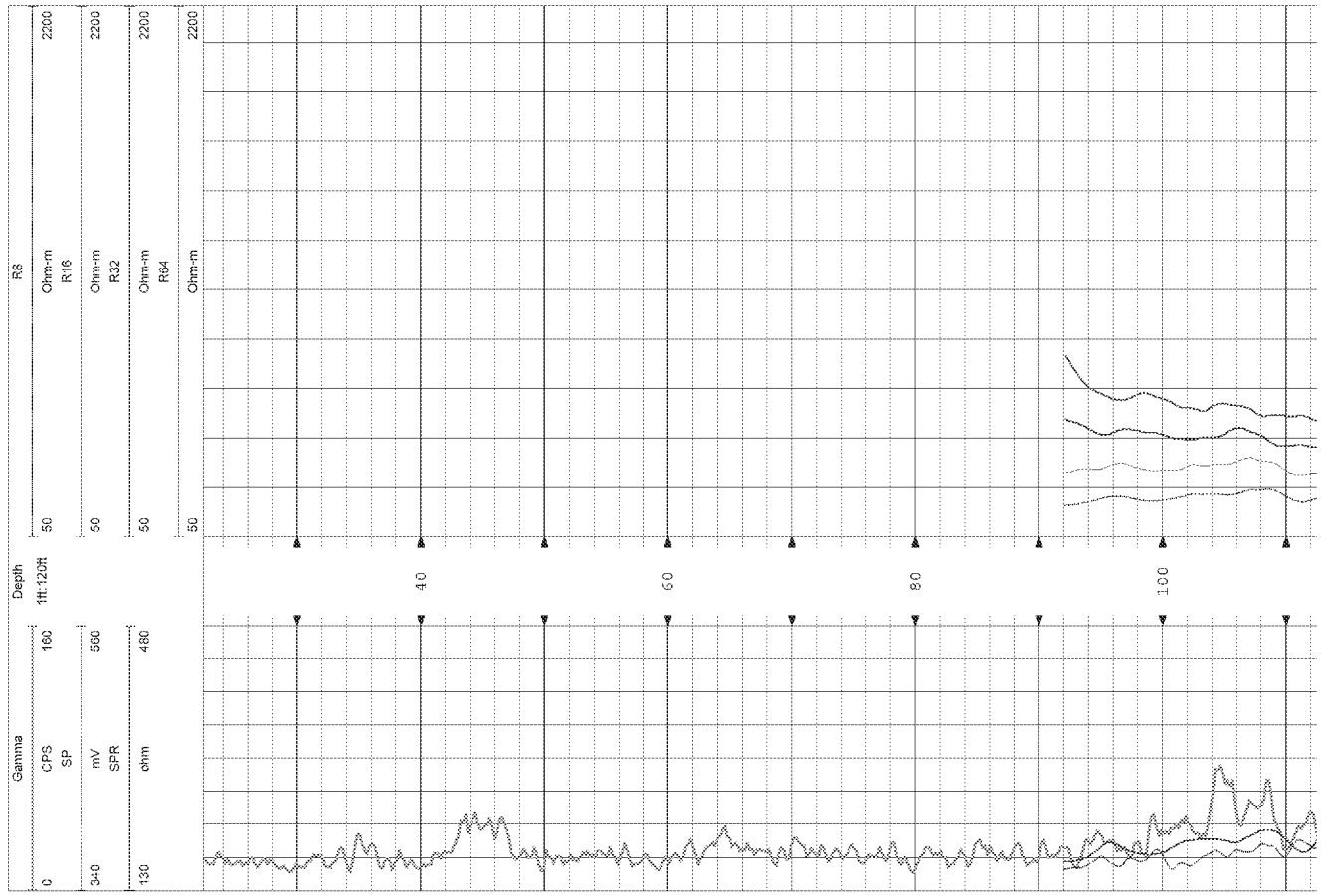
AQUA TERRA GEOPHYSICS INC.
13 Station Court, Bellport NY 11713
631.286.7699

COMPANY	UNITECH DRILLING
WELL ID	GM-21D2
FIELD	NGC OU2 ONCT DATA GAP
TOWN	BETHPAGE STATE NY
LOCATION	CORNER OF N. BUTEHORN & HARRISON AVE.
OTHER SERVICES	
CO	
WELL	
FLD	
CTY	
STE	
FILING No	
SEC	TWP RGE
LOGGING SPEED	20 FT. / MIN
ELEVATION	
COMMENTS	
LOG MEAS. FROM	GROUND SURFACE
DRILLING MEAS. FROM	

DATE	FEBRUARY 20, 2013	TYPE FLUID IN HOLE	BENTONITE
DRILLING CO.		SALINITY	
TYPE LOG		CONDUCTIVITY	207 uS/CM
DEPTH-DRILLER	870 FEET	LEVEL	
DEPTH-LOGGER	862 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	KARLA MIRANDA		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
				10 INCH	PVC	0 FEET	92 FEET



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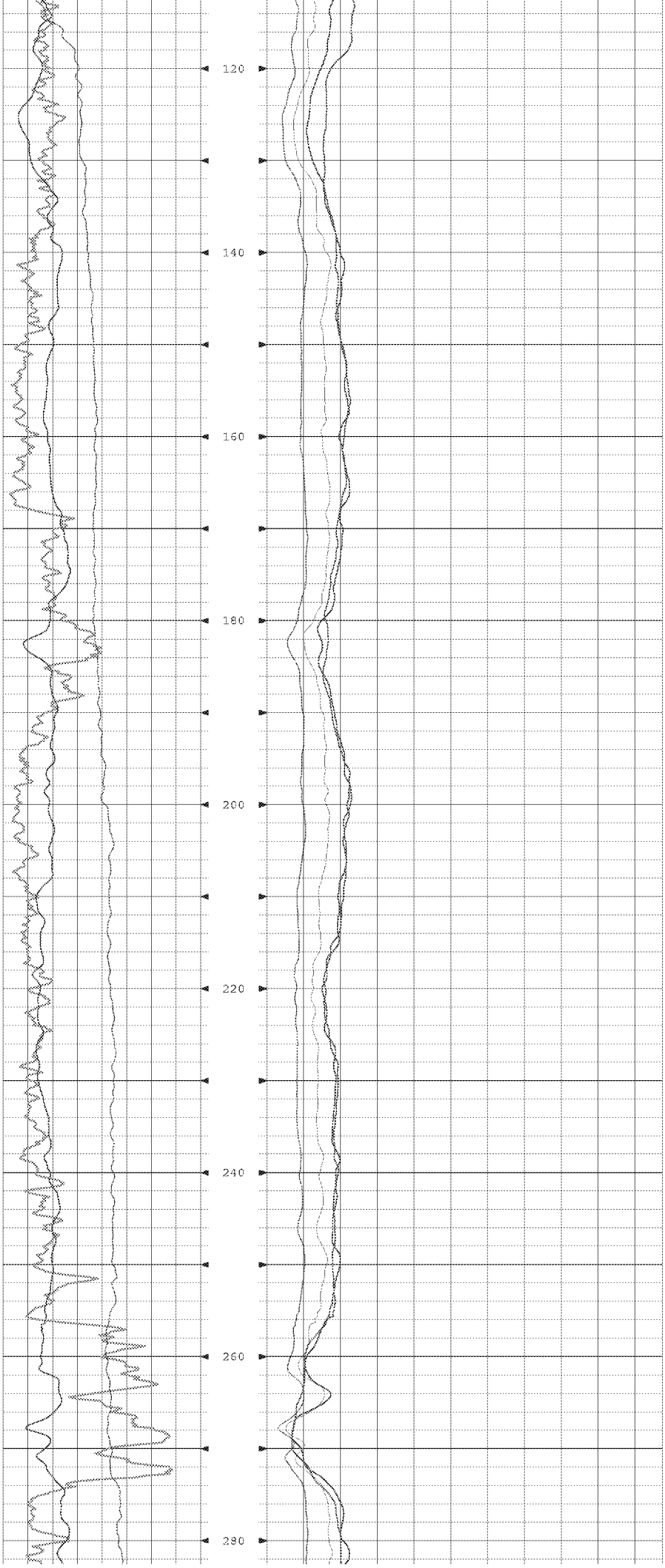
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220
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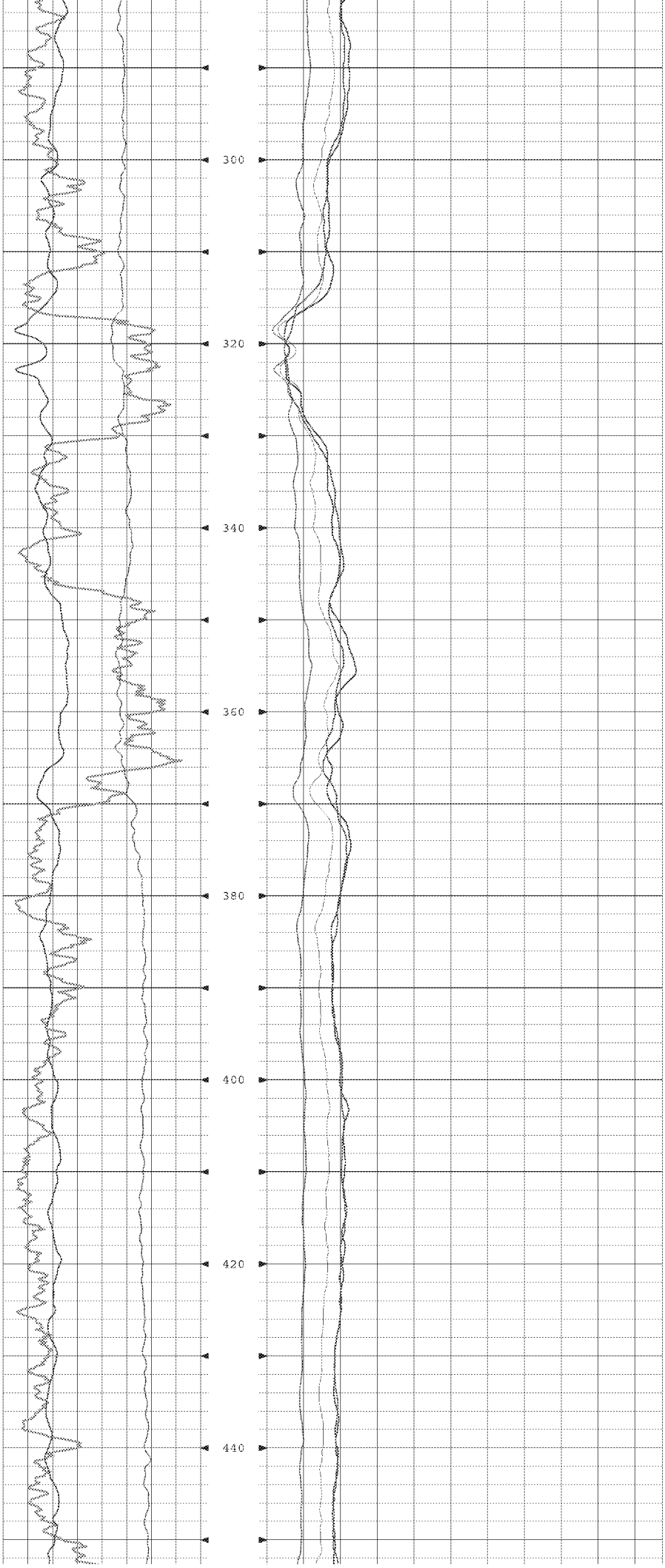
260
280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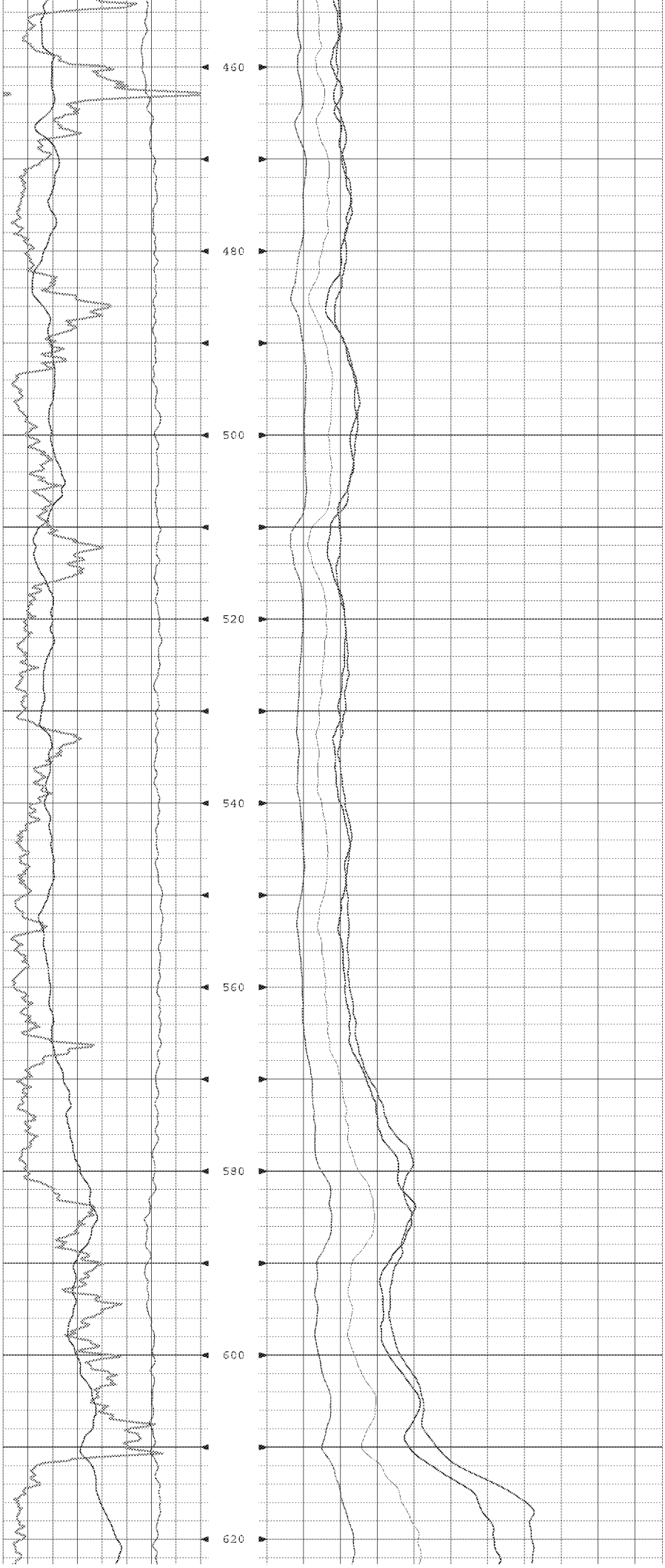
400
420
440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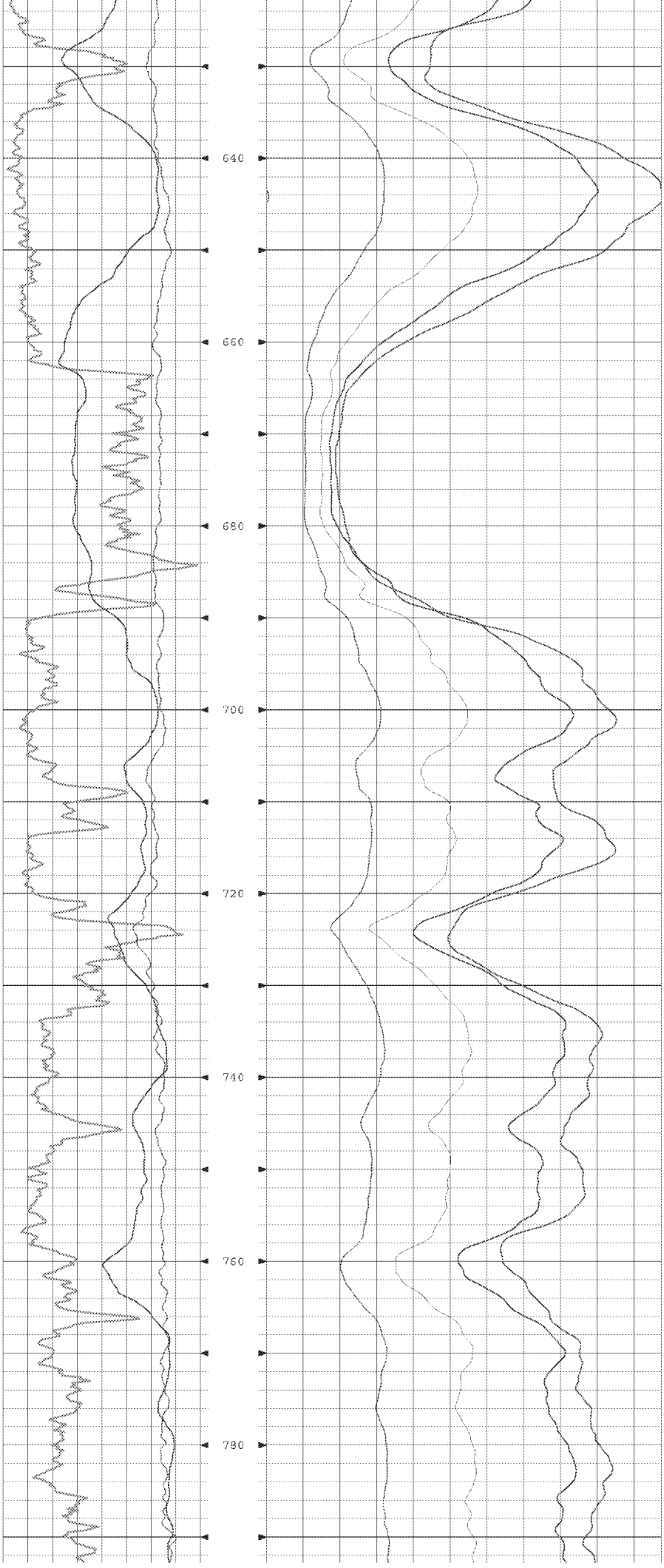
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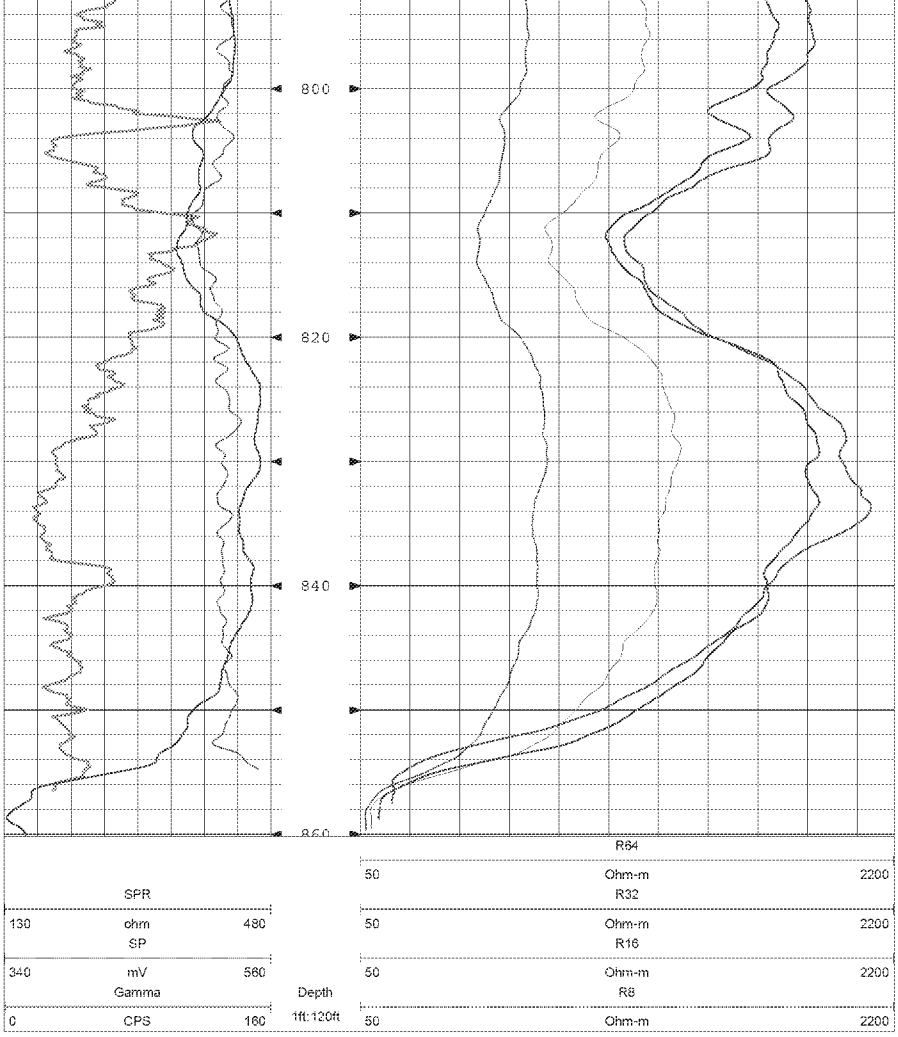
720
740
760
780

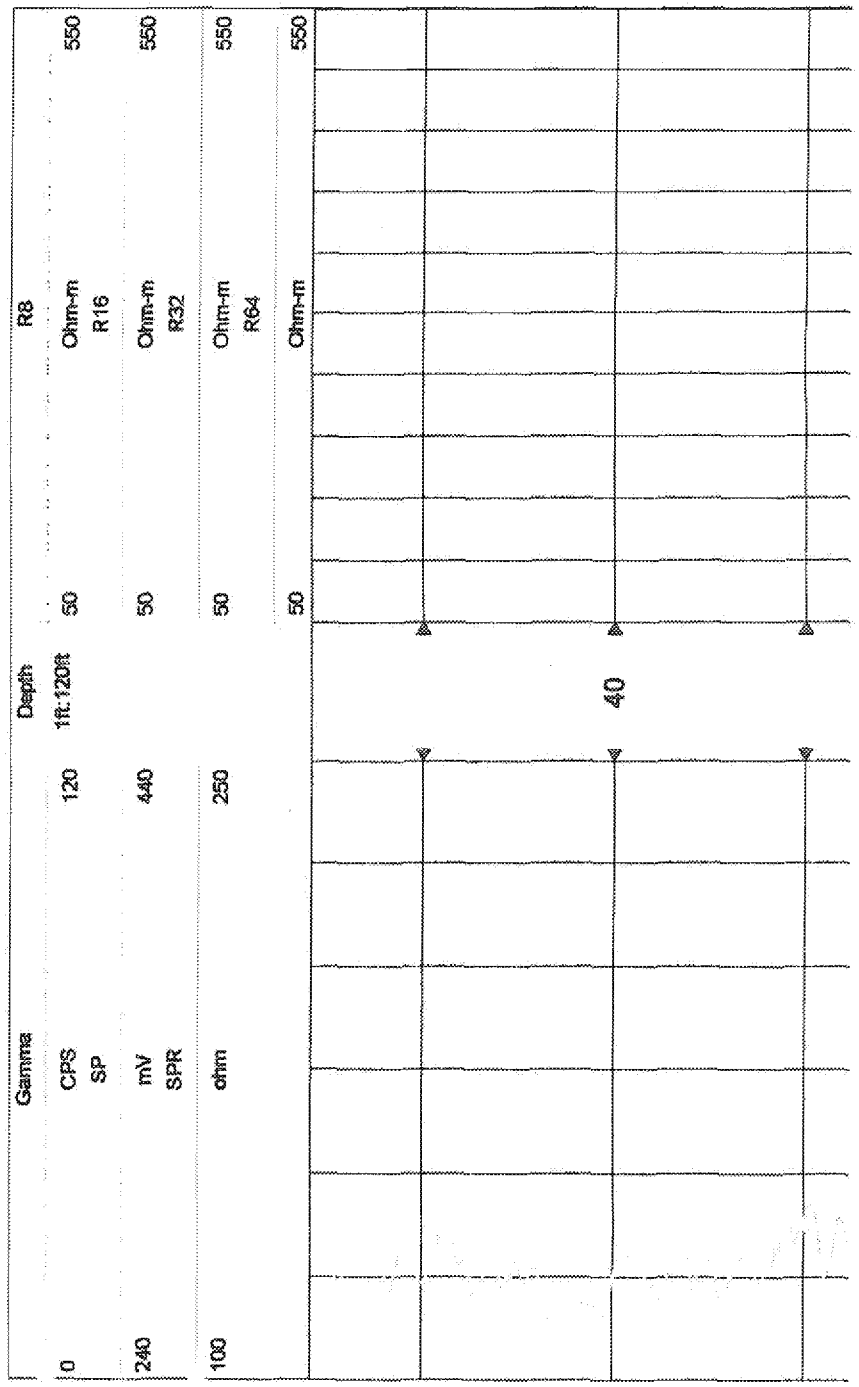

800
820
840
860
SPR
130 ohm 480
SP
340 mV 560
Gamma
0 CPS 160
Depth
1ft:120ft
R64
50 Ohm-m 2200
R32
50 Ohm-m 2200
R16
50 Ohm-m 2200
R8
50 Ohm-m 2200

AQUA TERRA GEOPHYSICS INC.
13 Station Court, Bellport NY 11713
631.286.7699

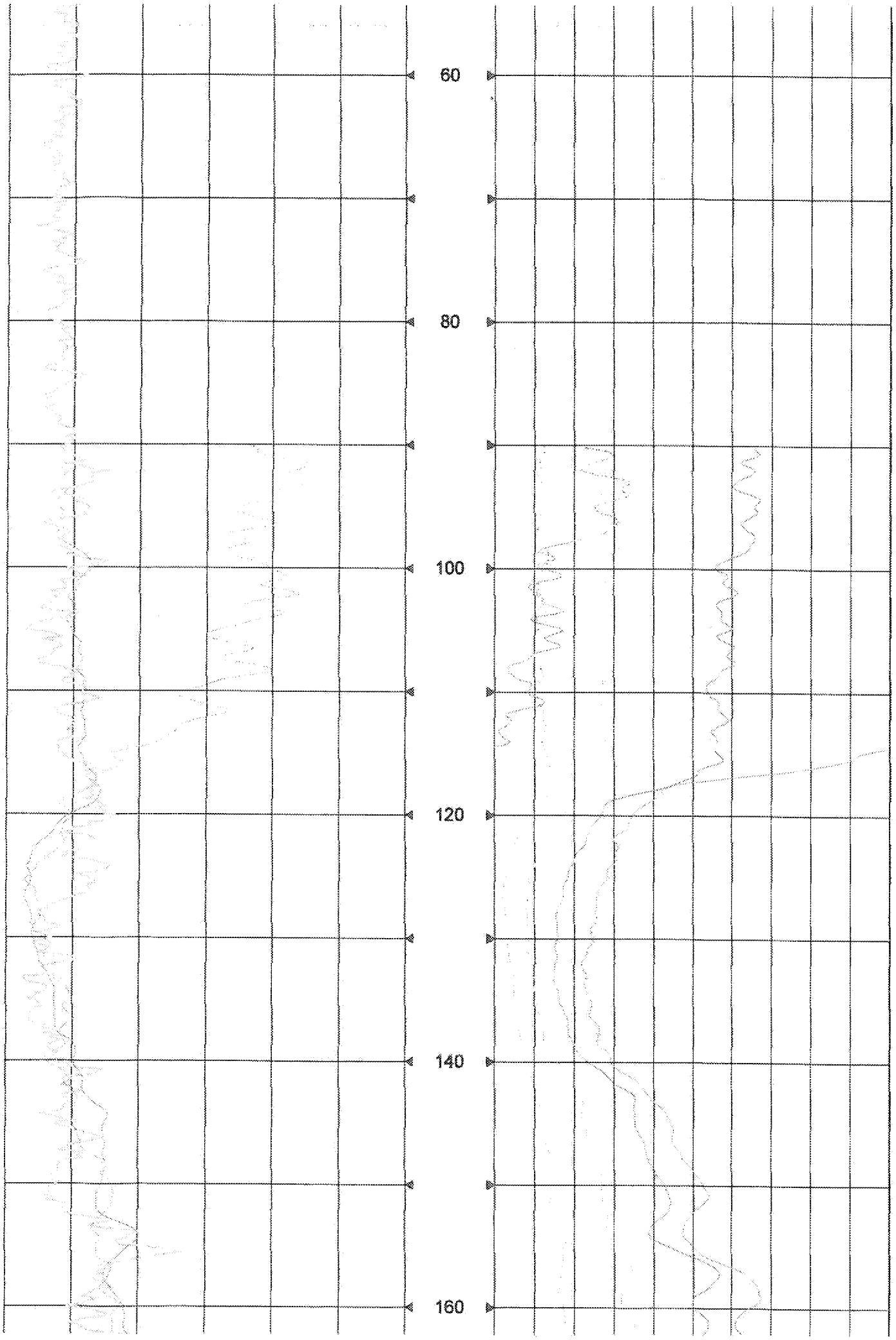
CO	COMPANY UNITECH DRILLING
WELL	WELL ID GM-78D2
FLD	FIELD
CTY	TOWN
STE	STATE
FILING No	
LOCATION	SEC TWP RGE
OTHER SERVICES	
LOGGING SPEED	<20 FT. / MIN.
ELEVATION	
COMMENTS	
LOG MEAS. FROM	GROUND SURFACE
DRILLING MEAS. FROM	

DATE	APRIL 2, 2013	TYPE FLUID IN HOLE	BENTONITE
DRILLING CO.		SALINITY	
TYPE LOG		CONDUCTIVITY	
DEPTH-DRILLER	510 FEET	LEVEL	
DEPTH-LOGGER	507 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	K. MIRANDA, D. STERN		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	14 INCH	0 FEET	90 FEET	10 INCH	PVC	0 FEET	90 FEET
	6 INCH	90 FEET	TOTAL DEPTH				



ED_002631A_00010556-00199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140
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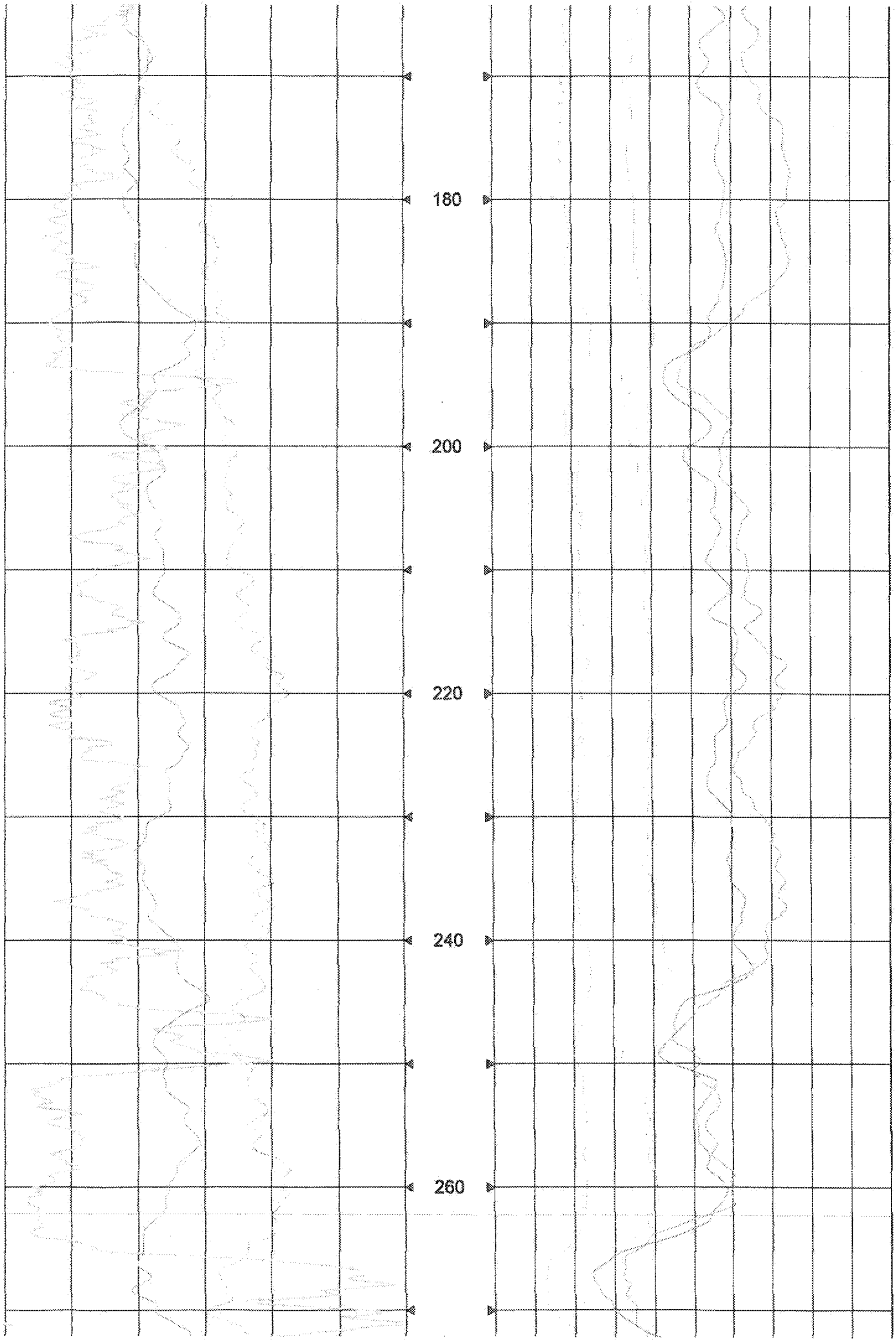
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220
240
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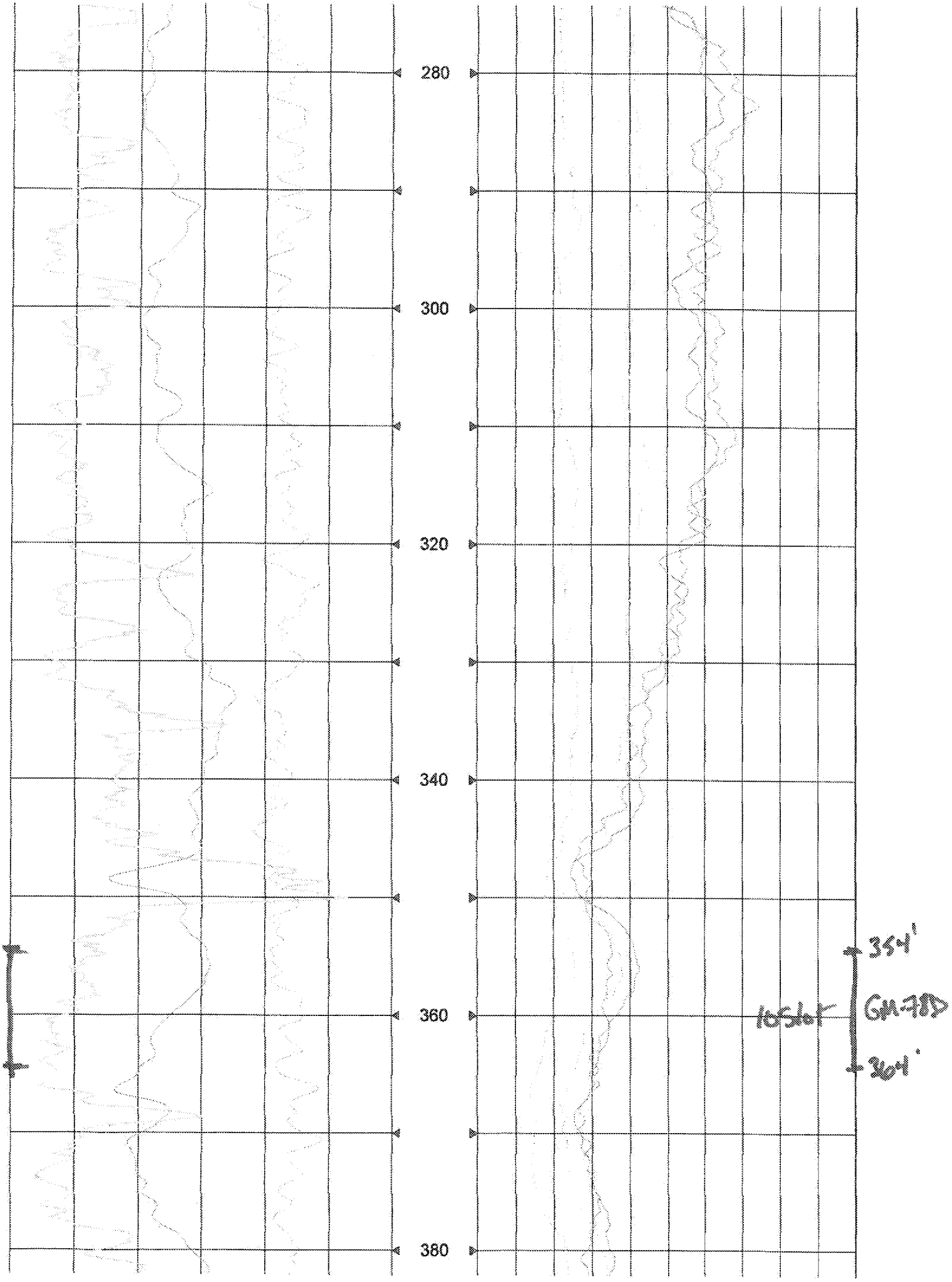
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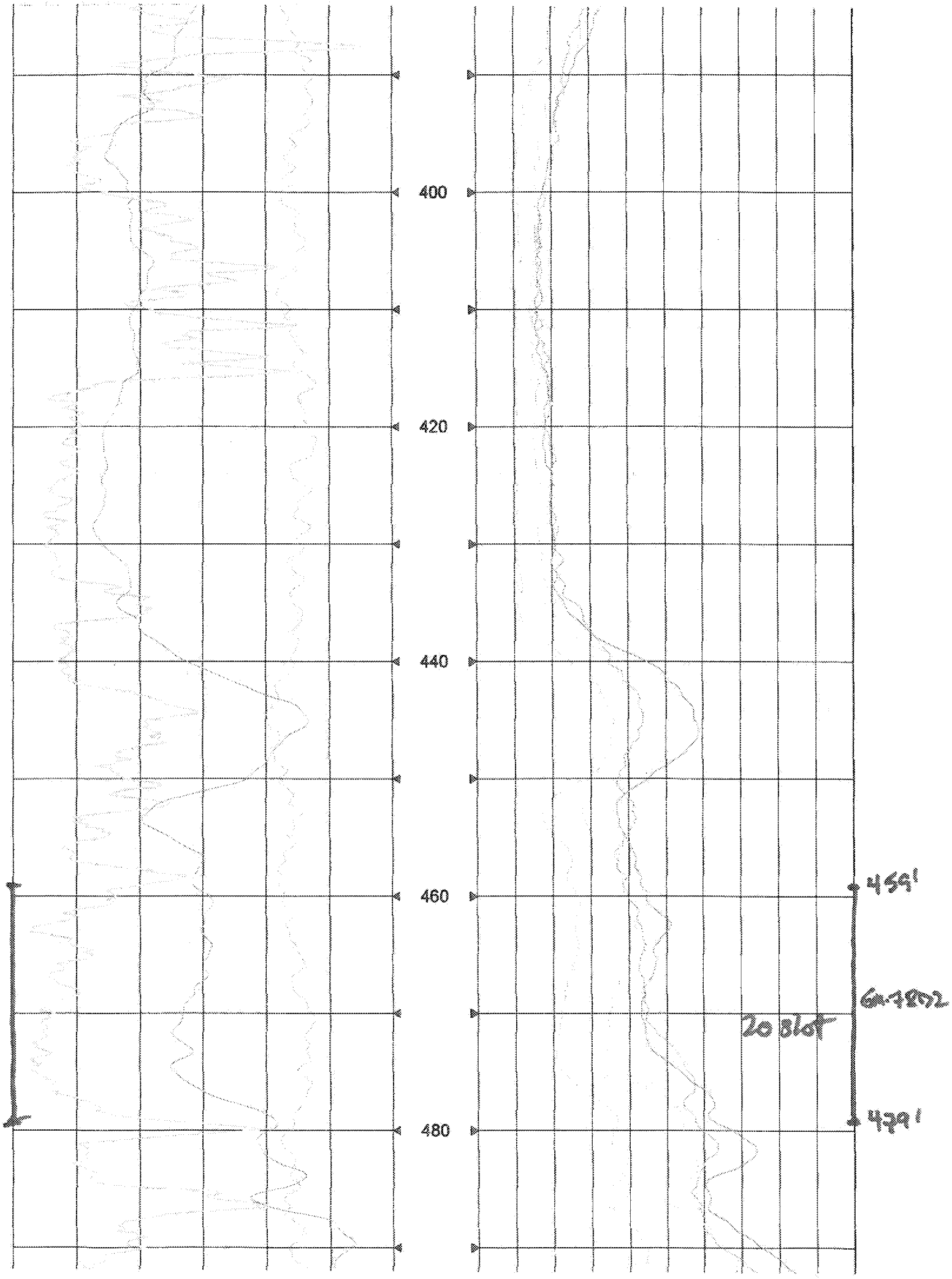
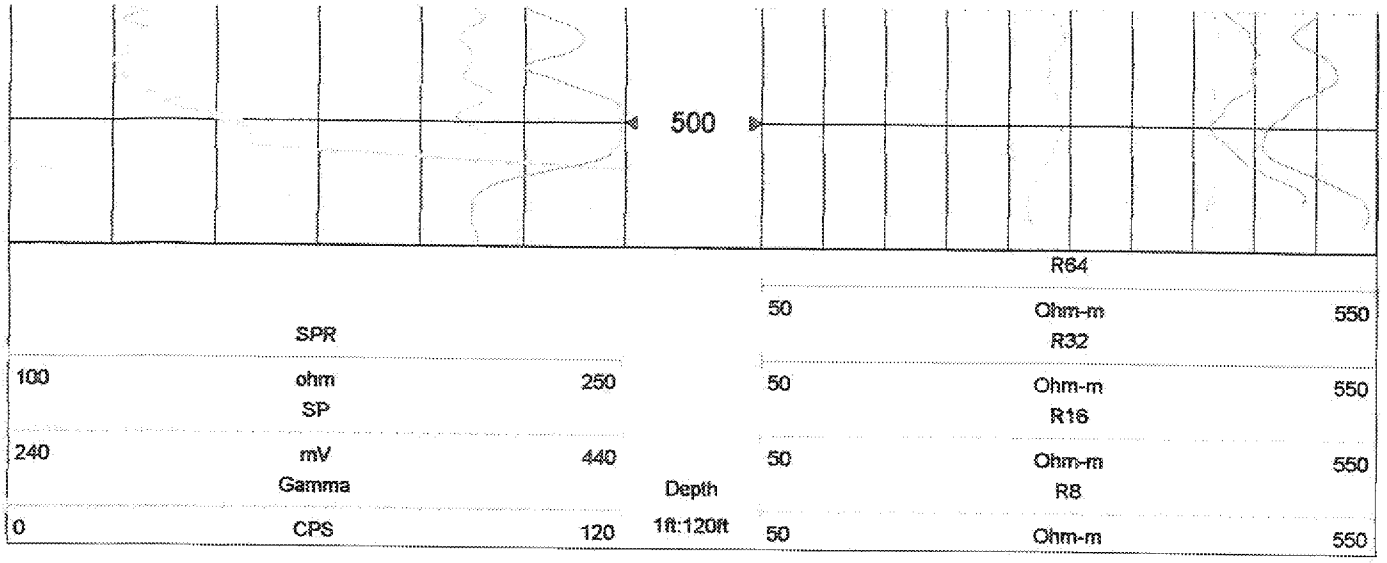
300
320
340
360
380
354'
GM-78D
364'


400
420
440
460
480
459'
20 slot
479'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R64
50
Ohm-m
550
SPR
R32
100
ohm
250
50
Ohm-m
550
SP
R16
240
mV
440
50
Ohm-m
550
Gamma
R8
Depth
0
CPS
120
1ft:120ft
50
Ohm-m
550

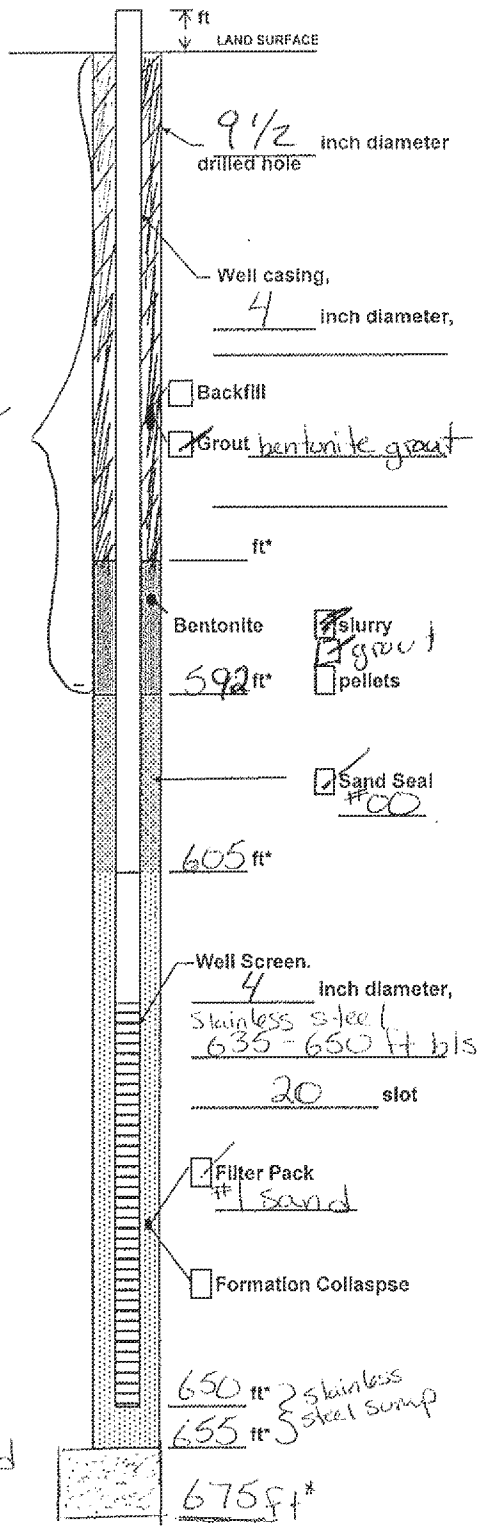
ARCADIS

Attachment C

Well Construction Logs

ARCADIS

Well Construction Log
(Unconsolidated)



Project Name and No. Northrop Grumman

Well -73D3 Town/City Bethpage

County Nassau State NY

Permit No. N-14025

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 1/20/12

Drilling Method mud rotary

Drilling Contractor Delta

Drilling Fluid mud

Development Technique(s) and Date(s)

air lift 2/3 - 2/8/12
water jetting 2/21/12

Fluid Loss During Drilling — gallons

Water Removed During Development 3,000 gallons

Static Depth to Water 40.43 feet below M.P.**

Pumping Depth to Water 44.08 feet below M.P.**

Pumping Duration — hours

Yield — gpm Date —

Specific Capacity — gpm/ft

Well Purpose

water level / water quality monitoring

Remarks

flush mount

* Depth Below Land Surface

**Measuring Point is Top of Well Casing Unless Otherwise Noted.

Prepared by Amber Caputo

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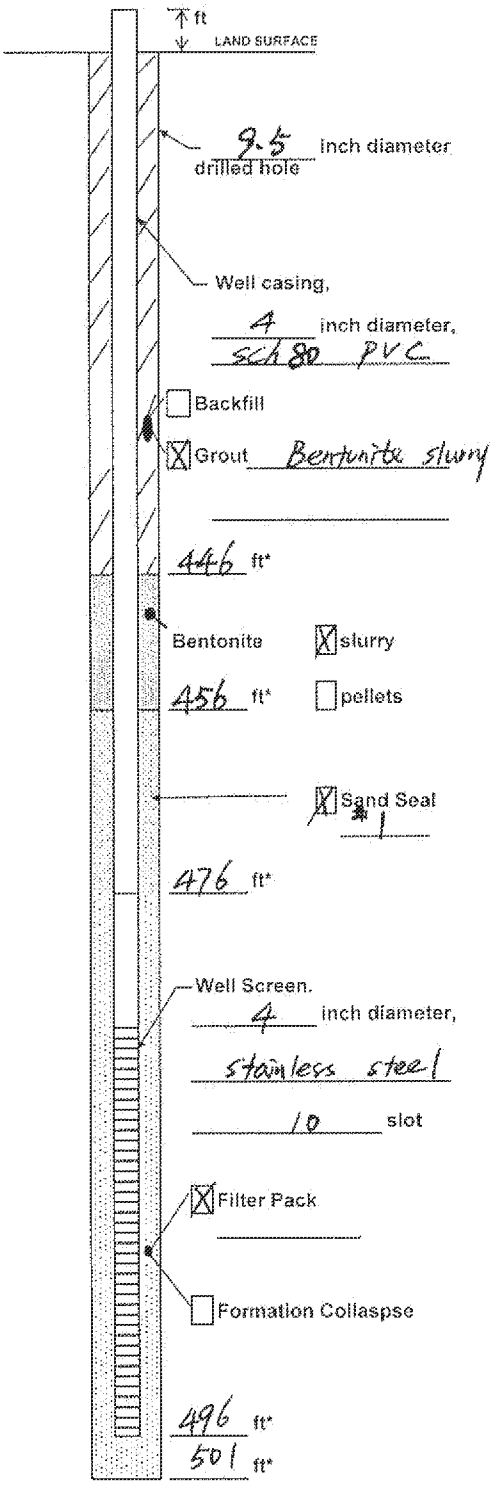
ARCADIS

Well Construction Log
(Unconsolidated)



Project Name and No. NGC GP3R / NY001496.0312.0MMH4

Well MW-3-1 Town/City Bethpage

County Nassau State NY

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s)

Drilling Method mud-rotary

Drilling Contractor Delta well & pump Co.

Drilling Fluid mud / Bentonite + water

Development Technique(s) and Date(s)

air-lifting / water jetting & pumping / pump & surge
3/26/12 – 3/27/12

Fluid Loss During Drilling gallons

Water Removed During Development 15000 gallons

Static Depth to Water 55.75 feet below M.P.**

Pumping Depth to Water 57.34 feet below M.P.**

Pumping Duration 3/4 hours

Yield 10 gpm Date 3/27/12

Specific Capacity 7.3 gpm/ft

Well Purpose monitoring well

Remarks

* Depth Below Land Surface

**Measuring Point is Top of Well Casing Unless Otherwise Noted.

Prepared by Sunny Xu

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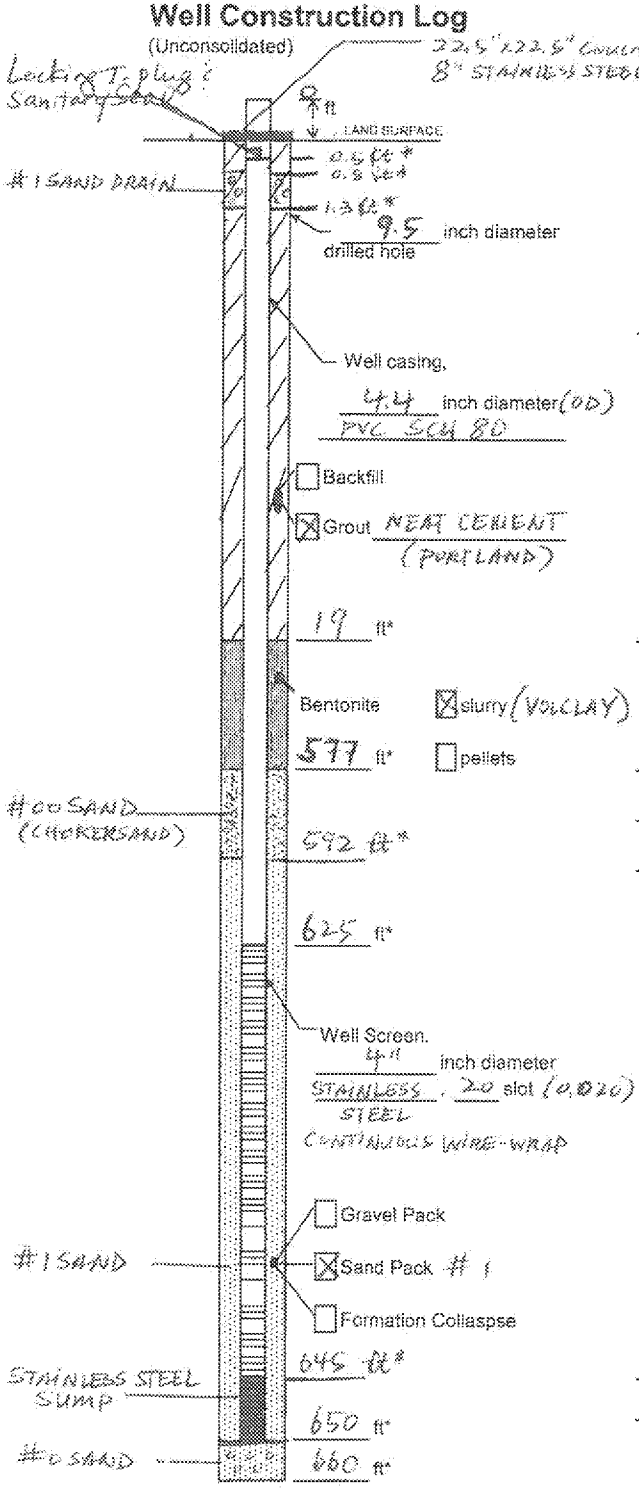
ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

* Depth Below Land Surface

Project NGL OU2 ONCT DATA GAP Well GW-74D3

Town/City NY001496.0212.ONCB5 Bethpage, NY

County NASSAU State NY

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 12-13-12

Drilling Method Mud Rotary (Failing 1500)

Drilling Contractor UniTech

Drilling Fluid Bentonite

Development Technique(s) and Date(s)

Water Jetting/Air Lifting: 12/18/12 - 01/07/13

pump and surge: 01/08/13

(3" submersible, 1 HRSEPWR) GRUNFOS

Fluid Loss During Drilling ~3800 gallons

Water Removed During Development 27,580 gallons

Static Depth to Water 48.44 feet below M.P.

Pumping Depth to Water 54.43 feet below M.P.

Pumping Duration NA hours

Yield NA gpm Date NA

Specific Capacity NA gpm/ft

Well Purpose Monitoring Well

Remarks

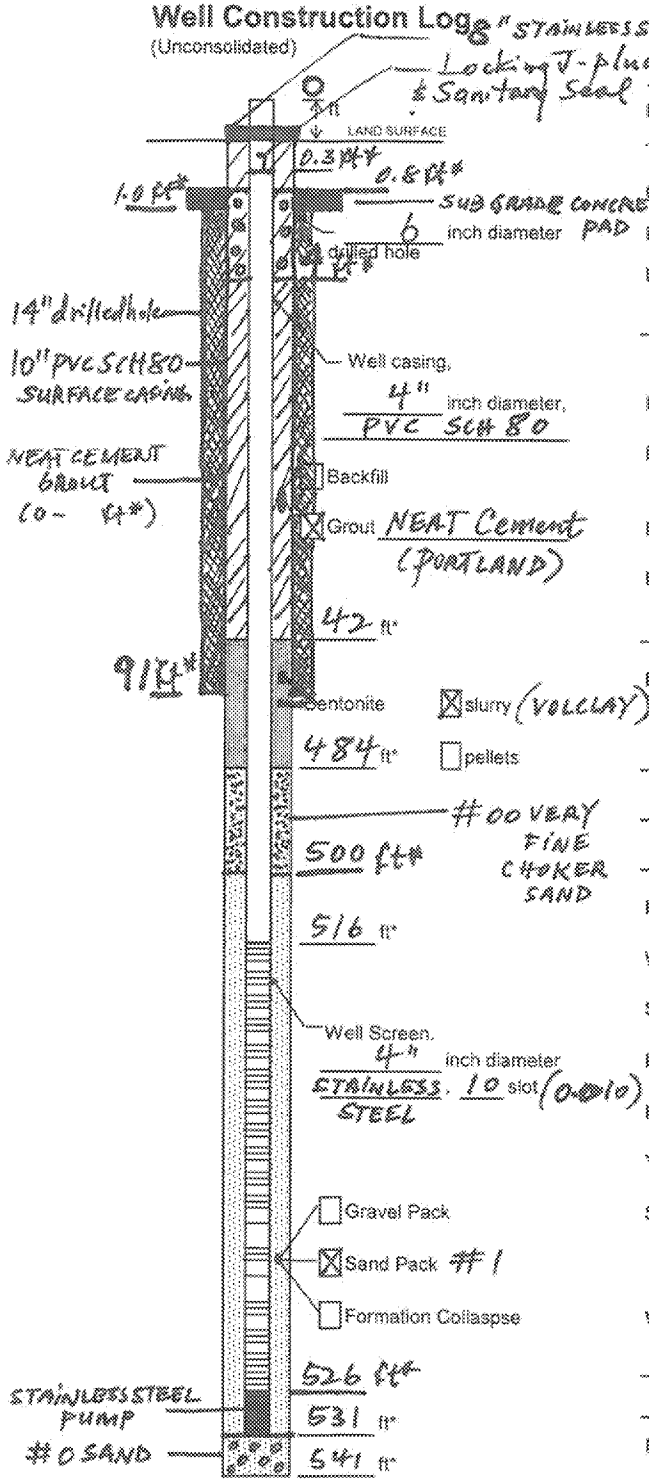
Prepared by Karla Miranda

G:\TECHNICL\FIELD LOGS\Well Construction (Unconsolidated).XLS- Sheet1

NGC 042 ONCT Data Gap
NY001496.0212. ONCB5
GM-21D2

ARCADIS

Well Construction Log
(Unconsolidated)



Project NGC 042 ONCT DATAGAP Well: GM-21D2

Town/City Bethpage

County NASSAU State NY

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 02-27-13

Drilling Method Mud Rotary (Failing 1500)

Drilling Contractor UniTech (Jim Evans = Driller)

Drilling Fluid Bentonite + water

Development Technique(s) and Date(s)

03/04/13 - 03/07/13: Air lifting / Water Jetting
03/11/13: Pump & Surge (3" submersible pump; GRUNFOS)

Fluid Loss During Drilling ~45x10³ gallons (4.5x10³ gal; 0-480 ft bgs)

Water Removed During Development ~16.5x10³ gallons

Static Depth to Water 46.95 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Monitoring Well

Remarks

Prepared by KARLA MIRANDA

Measuring Point is Top of Well Casing Unless Otherwise Noted.

* Depth Below Land Surface

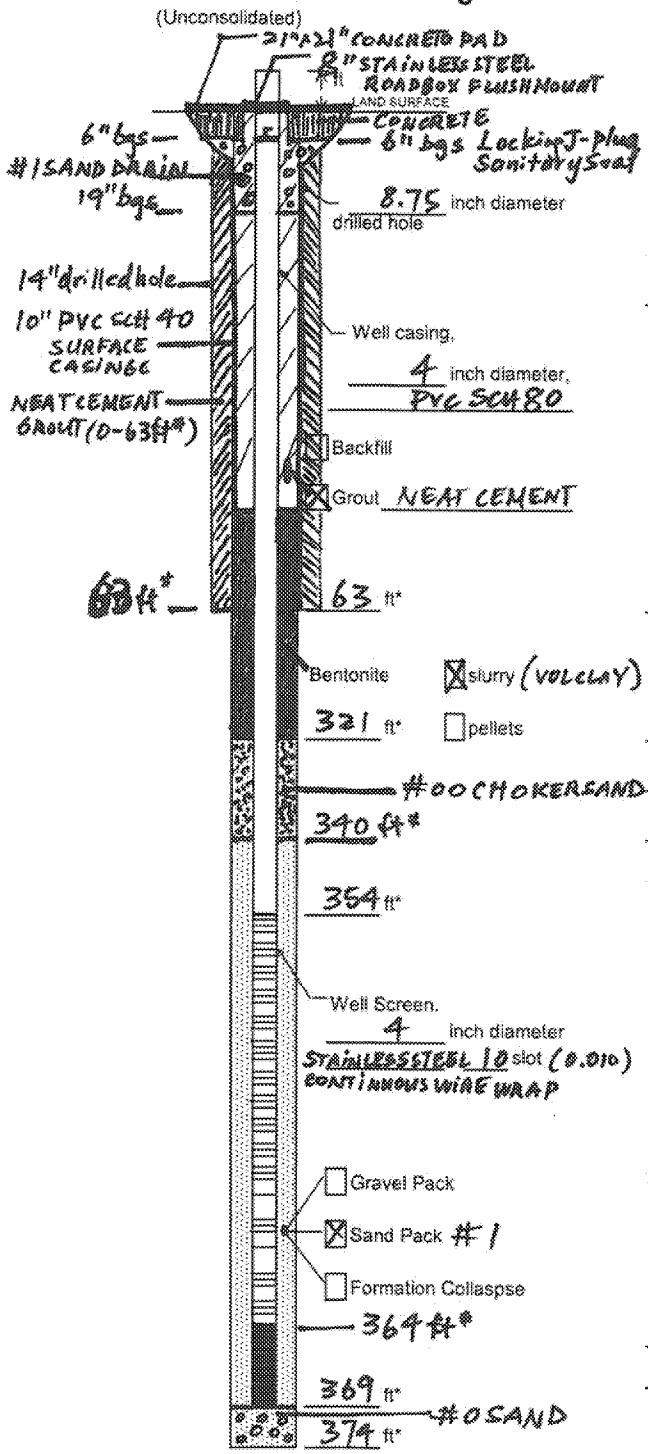
G:\TECHNICL\FIELD LOGS\Well Construction (Unconsolidated).XLS- Sheet1

NGC OU2 ONCT Data Gap
NY001496.0212.ONCB5
GM-78D

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project NGC OU2 ONCT Data Gap Well GM-78D

Town/City Bethpage

County NASSAU State NY

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 04/18/13

Drilling Method Mud Rotary Drill (Failing 1500)

Drilling Contractor Uni-Tech (Driller: Jim Evans)

Drilling Fluid Bentonite + Water (Quick Gel)

Development Technique(s) and Date(s)

Airlift/Water Jet: 04/23/13 – 04/25/13

Pump & Surge: 04/25/13 – 04/26/13 (3" submersible; GRUNFOS)

Fluid Loss During Drilling _____ gallons

Water Removed During Development ~14,800 gallons (~14,800 gal)

Static Depth to Water 49.16 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring Well

Remarks

Prepared by Karla Miranda

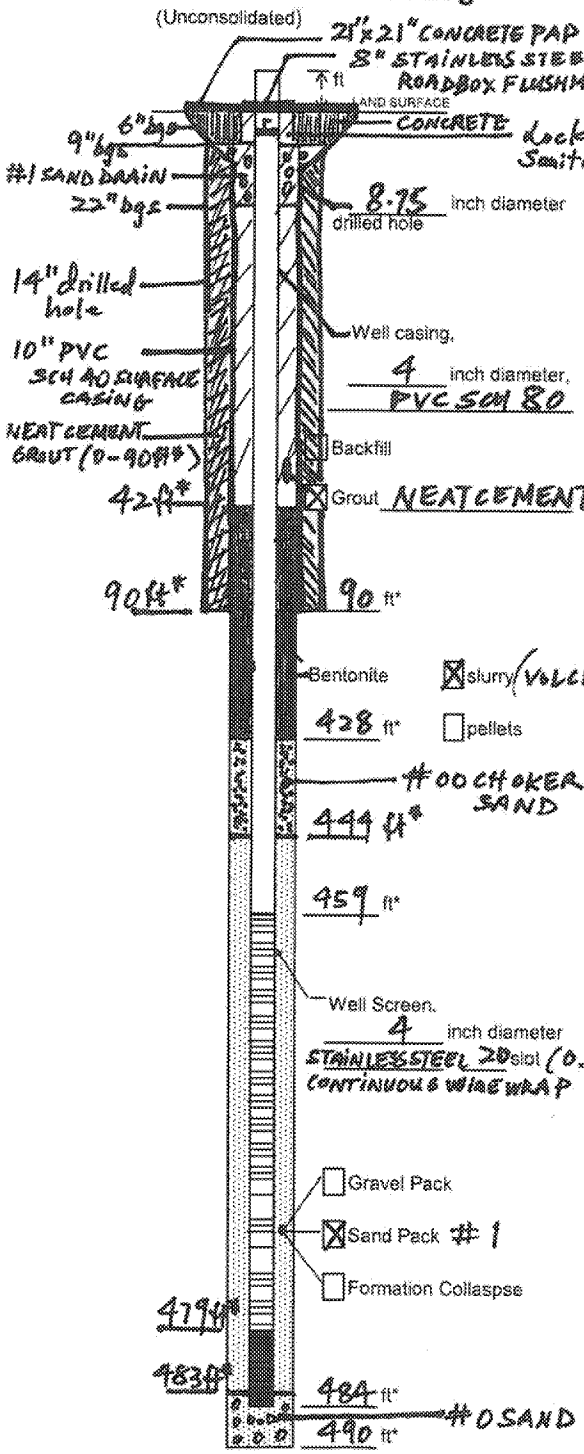
G:\TECHNICL\FIELD LOGS\Well Construction (Unconsolidated).XLS- Sheet1

NGC 002 ONCT Data Gap
NY001496.0212.ONCB5
GM-78D2

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project NGC 002 ONCT Data Gap Well Well: GM-78D2

Town/City Bethpage, NY

County NASSAU State NY

Permit No.

Land-Surface Elevation and Datum:

feet ☐ Surveyed ☐ Estimated

Installation Date(s) 04-04-13

Drilling Method Mud Rotary Drill (Failing 1500)

Drilling Contractor UniTech (Driller: Jim Evans)

Drilling Fluid Bentonite + Water (QuickGel)

Development Technique(s) and Date(s)

Air lift + Water Jet: 04/09/13 - 04/11/13

Pump & surge: 04/12/13 (3" submersible; GRUNFOS)

Fluid Loss During Drilling gallons

Water Removed During Development ~12,800 gallons (~12,800 gal)

Static Depth to Water 49.2 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Monitoring Well

Remarks

Prepared by Karla Miranda

G:\TECHNICL\FIELD LOGS\Well Construction (Unconsolidated).XLS - Sheet1

ARCADIS

Attachment D

Supplemental Data from 2nd Quarter 2013

Table D1. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Shallow Zone[1], Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in ug/L	NYSDEC Standards, Criteria, and Guidance Values in ug/L	Well ID: Sample ID: Sample Date:	FW-03 FW-03 6/10/2013	GM-15S GM-15S 5/24/2013	GM-15I GM-15I (REP) 5/24/2013	GM-15I GM-15I 5/24/2013	GM-17I GM-17I 6/11/2013	GM-18I GM-18I 6/12/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**50**	< 5.0	**0.34 J**	**0.31 J**	< 5.0	< 5.0
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**3.5 J**	**1.9 J**	< 5.0	< 5.0	**0.86 J**	< 5.0
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**54**	**1.9**	**0.34**	**0.31**	**0.86**	0

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM 4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
ug/L	micrograms per Liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-15I) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D1. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Shallow Zone[1], Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in ug/L	NYSDEC Standards, Criteria, and Guidance Values in ug/L	Well ID: Sample ID: Sample Date:	GM-20I GM-20I 6/12/2013	GM-21S GM-21S 5/29/2013	GM-74I GM-74I 5/23/2013	GM-78S GM-78S 5/29/2013	GM-78I GM-78I 5/29/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	5		< 5.0	< 5.0	**0.35 BJ**	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0 J	< 5.0	< 5.0
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**0.34 J**	**0.34 J**	**0.35 J**	< 5.0	**0.31 J**
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2		< 2.0	< 2.0	< 5.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**0.34**	**0.34**	**0.7**	0	**0.31**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM 4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
ug/L	micrograms per Liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-15I) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D1. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Shallow Zone[1], Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in ug/L	NYSDEC Standards, Criteria, and Guidance Values in ug/L	Well ID: Sample ID: Sample Date:	HN-24S HN-24S 6/10/2013	HN-40S HN-40S 5/28/2013	HN-40I HN-40I 5/28/2013	HN-42S HN-42S 5/28/2013	HN-42I HN-42I 5/28/2013	N-10631 N-10631 6/21/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	**1.9 J**	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	**0.23 J**	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	< 5.0	**0.24 J**	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	**0.21 J**	**0.26 J**	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	< 5.0	**0.76 J**	< 5.0	**1.1 J**	< 5.0
Ethylbenzene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 5.0	**0.38 J**	< 5.0
Tetrachloroethene	5		**1.3 J**	< 5.0	**2.1 J**	< 5.0	< 5.0	< 5.0
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**0.58 J**	< 5.0	**22**	< 5.0	**3.0 J**	**0.78 J**
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**1.9**	**0.21**	**27**	0	**4.5**	**0.78**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM 4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
ug/L	micrograms per Liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-15I) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D2. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Intermediate Zone[1], Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy, Northrop Grumman Systems Corporation, Bethpage, New Yor

Constituent in ug/L	NYSDEC Standards, Criteria, and Guidance Values (µg/L)	Well ID:	GM-21I	HN-24I
		Sample ID:	GM-21I	HN-24I
		Sample Date:	5/29/2013	6/10/2013
1,1,1-Trichloroethane	5		< 5.0	**1.6 J**
1,1-Dichloroethane	5		< 5.0	**2.8 J**
1,1-Dichloroethene	5		< 5.0	**9.6**
Carbon Tetrachloride	5		< 5.0	**0.37 J**
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0
Chloroform	7		< 5.0	**1.5 J**
cis-1,2-Dichloroethene	5		< 5.0	**1.1 J**
CFC-12	5		< 5.0	**0.85 J**
Methyl-Tert-Butylether	5		< 5.0	**1.2 J**
Tetrachloroethene	5		< 5.0	**33**
trans-1,2-Dichloroethene	5		< 5.0	< 5.0
Trichloroethene	5		**0.31 J**	**16**
CFC-11	5		< 5.0	**13**
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	**0.86 J**
Vinyl Chloride	2		< 2.0	< 2.0
TVOCs			**0.31**	**82**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM 4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-21I) does not necessarily designate the actual hydrogeologic zone.

Table D3. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep Zone[1]; Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: / Sample ID: / Sample Date:	GM-13D / GM-13D / 6/17/2013	GM-15D / GM-15D / 5/24/2013	GM-17D / GM-17D / 6/11/2013	GM-18D / GM-18D / 6/10/2013	GM-20D / GM-20D / 6/12/2013
1,1,1-Trichloroethane	5		**2.5 J**	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		**6.5**	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	5		**10**	< 5.0	< 5.0	< 5.0	< 5.0 J
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	5		< 5.0	< 5.0 J	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		**1.3 J**	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		**0.35 J**	**0.28 J**	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		**22**	< 5.0	< 5.0	< 5.0	< 5.0
CFC-12	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	**1.5 J**	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**180**	**0.30 J**	< 5.0	< 5.0	< 5.0
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0 J
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**72**	**0.36 J**	**0.34 J**	**0.92 J**	**0.32 J**
CFC-11	5		**0.86 J**	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	5		**2.9 J**	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**300**	**2.4**	**0.34**	**0.92**	**0.32**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
(1)	Well identification (e.g., GM-70D2) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D3. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep Zone[1]; Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID:	GM-21D	GM-36D	GM-37D	GM-38D	GM-39D$_A$	GM-70D2
		Sample ID:	GM-21D	GM-36D	GM-37D	GM-38D	GM-39D$_A$	GM-70D2
		Sample Date:	5/29/2013	8/12/2013	6/10/2013	6/13/2013	6/14/2013	6/13/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	**1.0 J**	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	**0.39 J**	**1.5 J**	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	< 5.0	< 5.0	**2.5 J**	< 5.0	< 5.0
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	**2.3 J**	< 5.0	< 5.0
Bromomethane	5		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	< 5.0	**0.93 J**	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	**1.7 J**	< 5.0	< 5.0
CFC-12	5		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	**0.27 J**	**0.72 J**	< 13	< 5.0	< 5.0
Tetrachloroethene	5		< 5.0	< 5.0	**0.28 J**	**11 J**	< 5.0	**3.1 J**
Toluene	5		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Trichloroethene	5		**1.8 J**	< 5.0	< 5.0	**410**	**2.8 J**	**12**
CFC-11	5		< 5.0	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	**2.5 J**	< 5.0	**0.29 J**
TVOCs			**1.8**	**0.27**	**1.4**	**430**	**2.8**	**15**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
[box]	Compound detected in exceedance of NYSDEC SCG Criteria
(1)	Well identification (e.g., GM-70D2) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D3. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep Zone[1]; Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID:	GM-74D	GM-79I	GM-79D	N-10624	N-10627
		Sample ID:	GM-74D	GM-79I	GM-79D	N-10624	N-10627
		Sample Date:	5/23/2013	5/28/2013	5/28/2013	6/12/2013	6/21/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	5		**0.29 BJ**	< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0 J	< 5.0 J	< 5.0 J	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
CFC-12	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		< 5.0	< 5.0	**0.46 J**	< 5.0	< 5.0
Toluene	5		< 5.0	< 5.0	**0.33 J**	< 5.0	< 5.0 B
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**1.6 J**	**0.23 J**	**19**	< 5.0	0.61 J
CFC-11	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**1.9**	**0.23**	**20**	0	**0.61**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).
Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.
Only detected constituents are summarized.
TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
B	Compound detected in associated blank sample
SCG	Standards, Criteria and Guidance
TCL	Target Compound List
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
(1)	Well identification (e.g., GM-70D2) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D4. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 2 Zone[1], Second Quarter Sampling Round 2013, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	GM-15D2 GM-15D2 5/24/2013	GM-21D2 GM-21D2 3/11/2013	GM-33D2 GM-33D2 6/18/2013	GM-34D GM-34D 6/17/2013	GM-34D2 GM-34D2 6/17/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 10	**0.21 J**
1,1-Dichloroethane	5		**0.24 J**	**0.21 J**	< 5.0	**0.88 J**	**0.34 J**
1,1-Dichloroethene	5		**1.1 J**	**0.3 J**	< 5.0	**4.0 J**	**1.4 J**
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Benzene	1		< 0.70	< 0.70	< 0.70	< 1.4	< 0.70
Bromomethane	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Carbon Tetrachloride	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Chlorobenzene	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Chlorodifluoromethane (Freon 22)	NE		**0.64 J**	< 5.0	< 5.0	< 10	**0.26 J**
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Chloroform	7		**0.31 J**	< 5.0	< 5.0	**0.44 J**	**0.22 J**
cis-1,2-Dichloroethene	5		**0.28 J**	**0.27 J**	**0.30 J**	**8.4 J**	**3.6 J**
CFC-12	5		< 5.0	< 5.0	< 5.0	< 10	**0.24 J**
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
Tetrachloroethene	5		**7.3**	**0.77 J**	**4.7 J**	**5.4 J**	**9.3**
Toluene	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 10	**0.38 J**
Trichloroethene	5		**11**	**18**	**27**	**330**	**180 D**
CFC-11	5		**0.59 J**	< 5.0	< 5.0	< 10	< 5.0
Trichlorotrifluoroethane (Freon 113	5		**1.1 J**	< 5.0	**5.6**	**6.8 J**	**1.5 J**
Vinyl Chloride	2		< 2.0	< 5.0	< 2.0	< 4.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 10	< 5.0
TVOCs			**23**	**20**	**38**	**360**	**200**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
B	Compound detected in associated blank sample
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-73D) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D4. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 2 Zone[1], Second Quarter Sampling Round 2013, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	GM-35D2 GM-35D2 5/23/2013	GM-36D2 GM-36D2 8/13/2013	GM-37D2 GM-37D2 6/5/2013	GM-38D2 GM-38D2 6/13/2013	GM-39D$_B$ GM-39D$_B$ 6/14/2013	GM-71D2 GM-71D2 6/5/2013
1,1,1-Trichloroethane	5		< 5.0	**0.35J**	**0.71J**	**0.78 J**	< 5.0	**1.7 J**
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	**0.69J**	**2.0 J**	**4.2 J**	< 5.0	**6.2**
1,1-Dichloroethene	5		< 5.0	**0.59 J**	**0.83J**	**1.1 J**	< 5.0	**2.9 J**
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	**0.65 J**	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	1		< 5.0	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Bromomethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	**0.26 J**
Chlorobenzene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0 J	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	**0.24 J**	**0.29 J**	**1.9 J**	< 5.0	**0.63 J**
cis-1,2-Dichloroethene	5		**0.48 J**	< 5.0	**0.23 J**	**2.0 J**	**0.43 J**	**0.67 J**
CFC-12	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	**0.22 J**	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**7.7**	< 5.0	**0.45J**	< 5.0	**0.49 J**	< 5.0
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**100**	**1.7 J**	**1.6 J**	**29**	**80**	**8**
CFC-11	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113	5		**1.5 J**	< 5.0	< 5.0	**0.38 J**	< 5.0	< 5.0
Vinyl Chloride	2		< 5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**110**	**3.6**	**6.3**	**40**	**81**	**20**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
B	Compound detected in associated blank sample
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-73D) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D4. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 2 Zone[1], Second Quarter Sampling Round 2013, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	GM-73D GM-73D 5/23/2013	GM-73D2 GM-73D2 5/23/2013	GM-74D2 GM-74D2 5/23/2013	GM-75D2 GM-75D2 (REP) 6/12/2013	GM-75D2 GM-75D2 6/12/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	**0.62 J**	**0.52 J**	< 5.0	< 5.0
1,1-Dichloroethene	5		< 5.0	**0.86 J**	**0.88 J**	**0.39 J**	**0.46 J**
1,2-Dichloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	1		< 5.0	< 5.0	< 5.0	< 0.70	< 0.70
Bromomethane	5		< 5.0	< 5.0	**0.29 BJ**	< 5.0	< 5.0
Carbon Tetrachloride	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0 J	< 5.0 J	**0.50 J**	< 5.0	< 5.0
Chloroethane	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	5		< 5.0	**0.42 J**	< 5.0	< 5.0	< 5.0
CFC-12	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		< 5.0	**1.4 J**	**5.3**	**2.1 J**	**2.1 J**
Toluene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**23**	**44**	**8.2**	**38**	**39**
CFC-11	5		< 5.0	< 5.0	**0.27 J**	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113	5		< 5.0	< 5.0	**0.73 J**	**0.64 J**	**0.82 J**
Vinyl Chloride	2		< 5.0	< 5.0	< 5.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOCs			**23**	**47**	**17**	**41**	**42**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
B	Compound detected in associated blank sample
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-73D) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D4. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 2 Zone[1], Second Quarter Sampling Round 2013, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	TT-101D TT-101D (REP) 6/26/2013	TT-101D TT-101D 6/26/2013	TT 101D1 TT 101D1 6/27/2013
1,1,1-Trichloroethane	5		**0.35 J**	**0.40 J**	**0.65J**
1,1,2-Trichloroethane	5		**0.21 J**	**0.23 J**	**0.45J**
1,1-Dichloroethane	5		**0.77 J**	**0.80 J**	**0.58J**
1,1-Dichloroethene	5		**3.0 J**	**2.9 J**	**3.1J**
1,2-Dichloroethane	5		**0.23 J**	< 5.0	< 5.0
1,2-Dichloropropane	5		< 5.0	< 5.0	< 5.0
Benzene	1		< 0.70	< 0.70	< 0.70
Bromomethane	5		< 5.0 J	< 5.0 J	< 5.0 J
Carbon Tetrachloride	5		< 5.0	< 5.0	**1.7J**
Chlorobenzene	5		< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		**0.63 J**	**0.67 J**	**0.84J**
Chloroethane	5		< 5.0	< 5.0	< 5.0
Chloroform	7		**0.51 J**	**0.43 J**	**0.91J**
cis-1,2-Dichloroethene	5		**2.7 J**	**2.7 J**	**1.7J**
CFC-12	5		**1.6 J**	**1.7 J**	**2.2J**
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**0.68 J**	**0.64 J**	**0.45J**
Toluene	5		< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 5.0	< 5.0	< 5.0
Trichloroethene	5		**70**	**73**	**160**
CFC-11	5		< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113	5		**11**	**12**	**12**
Vinyl Chloride	2		< 2.0	< 2.0	< 2.0
o-Xylene	5		< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 5.0	< 5.0	< 5.0
TVOCs			**92**	**95**	**190**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
B	Compound detected in associated blank sample
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-73D) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D4. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 2 Zone[1], Second Quarter Sampling Round 2013, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	Well 1 Well 1 6/6/2013	Well 3 Well 3 6/6/2013	Well 17 Well 17 6/6/2013	Well 18 Well 18 6/6/2013	Well 19 Well 19 (REP) 6/6/2013	Well 19 Well 19 6/6/2013
1,1,1-Trichloroethane	5		< 13	< 50	**0.52 J**	**0.76 J**	**0.50 J**	**0.45 J**
1,1,2-Trichloroethane	5		< 13	< 50	< 10	< 5.0	< 5.0	**0.21 J**
1,1-Dichloroethane	5		**0.68 J**	< 50	**1.3 J**	**1.1 J**	**0.87 J**	**0.84 J**
1,1-Dichloroethene	5		**2.2 J**	**8.7 J**	**2.3 J**	**3.0 J**	**1.6 J**	**1.6 J**
1,2-Dichloroethane	5		< 13	< 50	< 10	< 5.0	**0.47 J**	**0.47 J**
1,2-Dichloropropane	5		**5.9 J**	< 50	< 10	< 5.0	< 5.0	< 5.0
Benzene	1		< 1.8	< 7.0	< 1.4	< 0.70	< 0.70	< 0.70
Bromomethane	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Carbon Tetrachloride	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Chlorobenzene	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane (Freon 22)	NE		< 13	< 50	< 10	**0.33 J**	**0.41 J**	**0.36 J**
Chloroethane	5		< 13	**4.0 J**	< 10	< 5.0	< 5.0	< 5.0
Chloroform	7		< 13	< 50	**0.48 J**	**0.26 J**	**0.50 J**	**0.51 J**
cis-1,2-Dichloroethene	5		**3.9 J**	**8.3 J**	**4.5 J**	**1.7 J**	**23**	**24**
CFC-12	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**48**	**54**	**30**	**12**	**6.9**	**6.5**
Toluene	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
Trichloroethene	5		**380**	**1400**	**190**	**60**	**190**	**180**
CFC-11	5		< 13	< 50	< 10	**0.22 J**	**0.25 J**	**0.24 J**
Trichlorotrifluoroethane (Freon 113	5		**3.1 J**	**6.3 J**	**4.0 J**	**1.5 J**	**0.90 J**	**0.96 J**
Vinyl Chloride	2		< 5.0	**60**	< 4.0	< 2.0	< 2.0	< 2.0
o-Xylene	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
m,p-Xylene	5		< 13	< 50	< 10	< 5.0	< 5.0	< 5.0
TVOCs			**440**	**1500**	**230**	**80**	**220**	**220**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
B	Compound detected in associated blank sample
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria
[1]	Well identification (e.g., GM-73D) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

Table D5. Concentrations of Volatile Organic Compounds Detected in Groundwater Samples Collected from Wells in the Deep 3 Zone[1], Second Quarter Sampling Round 2013, OU2 On-Site Groundwater Remedy, Northrop Grumman Systems Corporation, Bethpage, New York.

Constituent in µg/L	NYSDEC Standards, Criteria, and Guidance Values in µg/L	Well ID: Sample ID: Sample Date:	GM-73D3 GM-73D3 6/24/2013	GM-74D3 GM-74D3 6/26/2013	TT-101D2 TT-101D2 6/26/2013
1,1,1-Trichloroethane	5		< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	5		< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	5		< 5.0	< 5.0	< 10
1,1-Dichloroethene	5		< 5.0	**0.31 J**	**2.1 J**
Carbon Tetrachloride	5		< 5.0	< 5.0	**1.1 J**
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0
Chloroform	7		< 5.0	< 5.0	**0.56 J**
cis-1,2-Dichloroethene	5		< 5.0	**0.30 J**	**1.6 J**
CFC-12	5		< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5		< 5.0	< 5.0	< 5.0
Tetrachloroethene	5		**0.49 J**	**1.4 J**	**0.80 J**
Toluene	5		**0.23 J**	**0.29 J**	< 10
Trichloroethene	5		**1.1 J**	**3.0 J**	**460 D**
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	**0.44 J**	**11**
TVOCs			**1.8**	**5.7**	**480**

Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2001; 2006).

Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3.

Only detected constituents are summarized.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation
VOCs	Volatile Organic Compounds
TVOCs	Total Volatile Organic Compounds
µg/L	micrograms per liter
NE	Not Established
J	Value is estimated concentration.
D	Secondary dilution
OU2	Operable Unit 2
TCL	Target Compound List
SCG	Standards, Criteria and Guidance
< 5.0	Compound not detected above its laboratory quantification limit.
	Compound detected in exceedance of NYSDEC SCG Criteria

[1] Well identification (e.g., TT-101D2) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

ARCADIS

Attachment E

Water Level Data from 2nd Quarter 2013

Table E1. Water-Level Measurement Data and Remedial Well Specific Capacities, July 15 and 16, 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Shallow Wells[1]			
FW-03	124.30	52.26	72.04
N-9921	94.23	--	--
N-10597	109.85	--	--
N-10600	102.41	--	--
N-10631	103.47	35.59	67.88
N-10633	103.80	--	--
N-10634	101.20	--	--
N-10821	91.58	--	--
GM-15S	109.44	41.82	67.62
GM-15I	109.29	41.68	67.61
GM-16SR	115.86	--	--
GM-17I	115.83	43.97	71.86
GM-17SR	115.79	--	--
GM-18S	107.60	--	--
GM-18I	109.03	41.74	67.29
GM-19S	109.86	--	--
GM-20I	103.88	33.91	69.97
GM-21S	105.81	33.62	72.19
GM-74I	107.42	38.31	69.11
GM-78S	104.94	38.30	66.64
GM-78I	105.06	38.56	66.50
GM-79S (N-10628)	100.88	--	--
HN-24S	122.73	48.41	74.32
HN-40S	116.35	46.18	70.17
HN-40I	115.91	45.55	70.36
HN-42S	120.32	47.88	72.44
HN-42I	119.61	47.25	72.36
MW-3R	101.45	49.71	51.74
Intermediate Wells[1]			
GM-16I	115.81	--	--
GM-19I	109.86	--	--
GM-21I	105.72	31.58	74.14
HN-24I	125.80	48.89	76.91

See notes on last page

Table E1. Water-Level Measurement Data and Remedial Well Specific Capacities, July 15 and 16, 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Deep Wells[1]			
N-10624	93.61	29.38	64.23
N-10627	93.70	29.90	63.80
GM-13D	113.97	42.83	71.14
GM-15D	109.84	44.31	65.53
GM-17D	115.68	46.50	69.18
GM-18D	108.88	42.87	66.01
GM-20D	103.92	35.91	68.01
GM-21D	105.66	40.49	65.17
GM-36D	91.63	--	--
GM-37D	97.26	36.33	60.93
GM-38D	91.75	36.91	54.84
GM-39D$_A$[2]	102.23	36.75	65.48
GM-70D2	99.58	39.09	60.49
GM-74D	107.43	42.57	64.86
GM-79I	101.09	37.52	63.57
GM-79D	101.25	39.02	62.23
BPOW1-1	72.00	28.42	43.58
BPOW1-2	71.82	32.63	39.19
Deep2 Wells[1]			
GM-15D2	109.78	46.98	62.80
GM-33D2	106.65	47.08	59.77
GM-34D	71.19	12.52	58.67
GM-34D2	71.19	15.08	56.11
GM-35D2	96.28	38.91	57.37
GM-36D2	91.60	--	--
GM-37D2	97.17	37.19	59.98
GM-38D2	91.56	40.02	51.54
GM-39D$_B$[2]	102.08	39.42	62.66
GM-71D2	98.45	39.18	59.27
GM-73D	104.87	41.78	63.09
GM-73D2	104.62	44.32	60.30
GM-74D2	107.36	50.70	56.66
GM-75D2	93.63	33.40	60.23
GM-78D	105.04	--	--
GM-78D2	105.05	--	--
GM-21D2	105.88	--	--

See Notes on last page

Table E1. Water-Level Measurement Data and Remedial Well Specific Capacities, July 15 and 16, 2013, OU2 On-Site Groundwater Remedy Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Deep 2 Wells[1]			
MW 3-1	104[6]	49.98	54.02
TT-101D	80.89	31.19	49.70
TT-101D1	80.92	33.80	47.12
Well 1	116.78	83.22	33.56
Well 3	117.78	183.70	-65.92
Well 17	104.10	65.22	38.88
Well 18	110.00	62.63	47.37
Well 19	108.70	62.18	46.52
BPOW1-3	71.92	32.97	38.95
BPOW1-4	56.68	12.81	43.87
BPOW2-1	58.64	19.56	39.08
BPOW2-2	58.50	20.11	38.39
BPOW2-3	57.98	19.61	39.39
BPOW3-1	61.43	26.85	34.58
BPOW3-2	61.82	28.61	33.21
BPOW3-3	60.64	23.82	36.82
Deep 3 Wells[1]			
GM-73D3	104.64	44.89	59.75
GM-74D3	107.58	47.92	59.66
BPOW1-5	56.75	13.22	43.53
BPOW1-6	57.06	13.42	43.64
BPOW3-4	62.44	25.68	36.76
BPOW4-1	67.34	28.02	39.32
BPOW4-2	67.18	26.43	40.75
TT-101D2	80.89	34.61	46.28

Remedial Well Specific Capacities [3]

Well ID	Pumping Depth to Water (ft bls)	Static Depth to Water (ft bls) [4]	Drawdown (s) (ft)	Third Quarter 2010 Pumping Rate (Q)(gpm) [5]	Specific Capacity (Q/s)(gpm/ft)
Well 1	83.22	51.50	31.72	806	25.41
Well 3	183.70	50.19	133.51	455	3.41
Well 17	65.22	44.12	21.10	1148	54.41
Well 18	62.63	50.15	12.48	635	50.88
Well 19	62.18	49.13	13.05	693	53.10

Notes

(1) Well identification (e.g., TT-101D2) does not necessarily designate the actual hydrogeologic zone. Determination of the hydrogeologic zones is based on the well screen interval and the regional model layering.

(2) Monitoring wells were voluntarily monitored in order to enhance coverage in the Deep and Deep2 zones.

(3) Specific capacity values are qualitative in nature, due to fluctuations in static water levels. Sharp declines in specific capacity could indicate the need for well redevelopment.

(4) For Wells 17, 18, and 19, baseline static depth to water measurements were collected in 1997 prior to OU2 system start-up; baseline pumping depth to water and rate measurements (not shown) used with baseline static depth to water measurements to calculate baseline specific capacities, were collected in 1999 during OU2 system operation.
For Well 1, baseline static depth to water was collected in 2012, during pump maintenance.
For Well 3, baseline static depth to water measurement was collected in 2011, during re-development activities.

(5) Pumping rate determined at time of pumping depth to water measurement.

(6) Surveyed elevation not available, elevation is estimated from topographic maps of the area.

ft msl feet relative to mean sea level
ft bmp feet below measuring point
-- Not measured.
OU2 Operablue Unit 2
ft bls feet below land surface
gpm gallons per minute