ARCADIS
Infrastructure, environment, buildings

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Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Subject:
Results of Third Quarter 2012 Groundwater Monitoring,
Operable Unit 2, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant (NWIRP) Sites, Bethpage, New York.
(NYSDEC Site #s 1-30-003A and B)

ENVIRONMENT

Date:
November 15, 2012

Contact:
David Stern

Phone:
631-391-5284

Email:
david.stern@arcadis-us.com

Our ref:
NY001496.0312.GWMI4

Dear Mr. Scharf:

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), ARCADIS is providing the NYSDEC with the validated results of Operable Unit 2 (OU2) groundwater monitoring, performed in accordance with the approved groundwater monitoring plan (ARCADIS G&M, Inc. 2006) and the Public Water Supply Contingency Plan (PWSCP) (ARCADIS G&M, Inc. 2003), plus additional wells installed by the Navy that Northrop Grumman agreed to monitor on a voluntary basis. Table 1 provides OU2 remedial system performance operational data and water balance. Tables 2 through 4 provide the validated analytical results of monitoring for this period. Figure 1 shows the site plan with well locations.

Please contact us if you have any questions or comments.

Sincerely,

ARCADIS of New York, Inc.

David E. Stern
Senior Hydrogeologist

Carlo San Giovanni

Carlo San Giovanni
Project Manager

Enclosures

Imagine the result

Copies:
Kent Smith – Northrop Grumman
Ed Hannon – Northrop Grumman
Walter Parish – NYSDEC Region 1
Bill Spitz - NYSDEC Region 1
Steven Karpinski – New York State Department of Health
Michael Alarcon – Nassau County Department of Health
Joseph DeFranco – Nassau County Department of Health
Lora Fly – NAVFAC Midlant Environmental
David Brayack – TetraTech NUS, Inc.
Roger Smith – Glenn Springs Holdings, Inc.
Kevin Lumpe – Steel Equities
Thomas Taccone – USEPA
Matthew Russo – Town of Oyster Bay
John Caruso – Massapequa Water District
Matthew Snyder – Aqua New York
Charles Prucha – South Farmingdale Water District
John Reinhardt – Town of Hempstead Water District
Michael Boufis – Bethpage Water District
Anthony J. Sabino Esq. – Bethpage Water District
Lois Lovisolo – Bethpage Public Library (Public Repository)
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Table 1. Operational Summary for the On-Site Portion of the Operable Unit 2 Groundwater Remedy, Third Quarter 2012, Northrop Grumman Systems Corporation, Bethpage, New York. [1]

Identification	Flow Rates (gpm)		Quarterly Flow Volumes (MG)			VOC Concentrations (ug/L)		VOC Mass Removed (lbs) [7]
	Design [2]	Average [3,4]	Design [2]	Actual [3,4]	% of Design	TCE [5]	TVOC [5,6]	Quarterly
Influent Groundwater								
Well 1 [10]	800	830	104.8	82.7	79%	350	410	284
Well 3	700	711	91.7	90.4	99%	1,500	1,690	1,249
Well 17	1,000	1,003	131.0	126.2	96%	210	254	262
Well 18	600	627	78.6	81.4	104%	62	84	56
Well 19	700	701	91.7	90.9	99%	170	203	151
Total	3,800	3,872	498	472	95%	--	--	2,002
Effluent Groundwater [8]								
Calpine	100 - 400	467	--	62.5	--	--	--	--
OXY Biosparge [11]	14 - 54	0.0	--	0.0	--	--	--	--
West Recharge Basins	1,112 - 1,455	453	--	59.4	--	--	1.56	--
South Recharge Basins [12]	2,231	2,669	292.4	349.7	120%	--	0.59	--
Total	--	3,589	--	472	--	--	--	--
Treatment Efficiencies [9]								
Tower 96 System Efficiency:	99.9%							
Tower 102 System Efficiency:	99.5%							

see footnotes on last page

Table 1. Operational Summary for the On-Site Portion of the Operable Unit 2 Groundwater Remedy, Third Quarter 2012, Northrop Grumman Systems Corporation, Bethpage, New York. (1)

(1) Quarterly reporting period: July 02, 2012 through October 01, 2012.

(2) "Design" flow rates were determined for the five remedial wells and for the South Recharge Basins based on computer modeling (ARCADIS G&M, Inc. 2003c, modified in April 2005). Flow rates for Calpine, OXY Biosparge and West Recharge Basins are typical flow rates and are provided for reader information. "Design" flow volumes represent the volume of water that should be pumped/discharged during the reporting period and is calculated by multiplying the design rate by the reporting period duration.

(3) "Average" flow rates for the remedial wells represent the average actual pumping rates when the pumps are operational and do not take into account the time that a well is not operational. During this reporting period, the remedial wells operated for the following percentage of the time: Well 1 (76%), Well 3 (97%), Well 17 (96%), Well 18 (99%), and Well 19 (99%). "Actual" volumes are determined via totalizing flow meters.

(4) "Average" flow rates for the system discharges represent the average flow rate during the entire reporting period and are determined by dividing the total flow during the reporting period by the reporting period duration. The Calpine, OXY Biosparge, and South Recharge Basins flow volumes are determined via totalizing flow meters. The West Recharge Basin flow is calculated by subtracting the cumulative flow to the other discharges from the total influent flow. Actual flow to the recharge basins are greater than shown because storm water combines with the plant effluents prior to discharge to the recharge basins.

(5) The TCE and TVOC concentrations for the remedial wells are from the quarterly sampling event performed during this reporting period (Table 2).

(6) The TVOC concentration for the two sets of recharge basins are their respective average monthly SPDES concentration for the current quarter.

(7) TVOC mass removed for the reporting period is calculated by multiplying the TVOC concentration from the quarterly sampling event and the quantity of water pumped during the reporting period.

(8) There are five discharges for the effluent groundwater: South Recharge Basins, West Recharge Basins, Calpine, OXY Biosparge system, and pipe loss. Treated water is continuously discharged to the south and west recharge basins, and is available "on-demand" to both the Calpine Power Plant (Calpine) for use as make-up water, and the biosparge remediation system operated by Occidental Chemical (OXY Biosparge).

(9) Treatment System Efficiencies are calculated by dividing the difference between the influent and effluent TVOC concentrations by the influent concentration.

(10) Well 1 operated intermittantly from August 30, 2012 through September 25, 2012 due to a communication/control problem between the well and Tower 96. During this period, Well 1 was only operated when operators were on-site and was pumped at a higher pumping rate (1,000 gpm) than normal 800 gpm.

(11) OXY Biosparge was not in operation throughout the majority of the quarter due to construction related activities and was restarted the week of September 17, 2012.

(12) The discharge flow rate and flow volume to the south basin (T102 weir overflow) were estimated throughout the duration of this reporting period due to the need for re-calibration of the ultrasonic level indicator associated with the water level over the weir. Estimated values were calculated using historic data associated with the total clear well water elevation and weir overflow rates.

Acronyms:

--	Not Available or Not Applicable	lbs	pounds
TVOC	Total Volatile Organic Compounds	MG	Million Gallons
gpm	gallons per minute	ug/L	micrograms per liter
SPDES	State Pollutant Discharge Elimination System	OU2	Operable Unit 2
NG	Northrop Grumman Systems Corporation	NYSDEC	New York State Department of Environmental Conservation
TCE	Trichloroethene		

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Table 2. Concentrations of Volatile Organic Compounds Detected in Monitoring Wells and Groundwater Remedial Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	GM-15S / GM-15S / 9/11/2012	GM-15I / GM-15I / 9/11/2012	GM-15D / GM-15D / 9/12/2012	GM-15D2 / GM-15D2 / 9/12/2012	GM-17I / GM-17I / 9/10/2012	GM-17D / GM-17D / 9/10/2012	GM-18I / GM-18I / 9/10/2012	GM-18D / GM-18D / 9/10/2012
1,1,1-Trichloroethane		< 5	< 5	< 5	**0.27 J**	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane		< 5	< 5	< 5	**0.24 J**	< 5	< 5	< 5	< 5
1,1-Dichloroethene		< 5	< 5	< 5	**1.1 J**	< 5	< 5	< 5	< 5
1,2-Dichloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone (MEK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone (MBK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone (MIK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene		< 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
Bromoform		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform		< 5	< 5	**0.38 J**	**0.39 J**	< 5	< 5	< 5	< 5
Chloromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		< 5	< 5	< 5	**0.41 J**	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		< 5	**0.58 J**	**0.43 J**	**6.4**	< 5	< 5	< 5	< 5
Toluene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene		**0.56 J**	< 5	**0.55 J**	**10**	**0.45 J**	< 5	**0.34 J**	**1.4 J**
Trichlorotrifluoroethane (Freon 113)		< 5	< 5	< 5	**1 J**	< 5	< 5	< 5	< 5
Vinyl Chloride		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOC		**0.56**	**0.58**	**1.4**	**20**	**0.45**	0	**0.34**	**1.4**

See last page notes and abbreviations.

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Table 2. Concentrations of Volatile Organic Compounds Detected in Monitoring Wells and Groundwater Remedial Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	GM-33D2 GM-33D2 9/6/2012	GM-34D GM-34D 9/7/2012	GM-34D2 GM-34D2 9/7/2012	GM-35D2 GM-35D2 9/13/2012	GM-38D GM-38D 9/13/2012	GM-38D2 GM-38D2 9/13/2012	GM-39DA GM-39DA 8/28/2012	GM-39DB GM-39DB 8/28/2012
1,1,1-Trichloroethane		< 5	< 13	< 5	< 5	**1.4 J**	**0.71 J**	< 5	< 5
1,1,2,2-Tetrachloroethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
1,1,2-Trichloroethane		< 5	< 13	< 5	< 5	**0.95 J**	< 5	< 5	< 5
1,1-Dichloroethane		< 5	**1.1 J**	**0.39 J**	< 5	**1.5 J**	**0.78 J**	< 5	< 5
1,1-Dichloroethene		< 5	**4.7 J**	**1.4 J**	< 5	**3.3 J**	**0.2 J**	< 5	< 5
1,2-Dichloroethane		< 5	< 13	< 5	< 5	**3.1 J**	< 5	< 5	< 5
1,2-Dichloropropane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
2-Butanone (MEK)		< 50	< 130	< 50	< 50	< 130	< 50	< 50	< 50
2-Hexanone (MBK)		< 50	< 130	< 50	< 50	< 130	< 50	< 50	< 50
4-methyl-2-pentanone (MIK)		< 50	< 130	< 50	< 50	< 130	< 50	< 50	< 50
Acetone		< 50	< 130	< 50	< 50	< 130	< 50	< 50	< 50
Benzene		< 0.7	< 1.8	< 0.7	< 0.7	< 1.8	< 0.7	< 0.7	< 0.7
Bromodichloromethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Bromoform		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Bromomethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Carbon Disulfide		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Carbon Tetrachloride		< 5	< 13	< 5	< 5	**0.5 J**	< 5	< 5	< 5
Chlorobenzene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Chloroethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Chloroform		< 5	< 13	**0.32 J**	< 5	**0.68 J**	**1.7 J**	< 5	< 5
Chloromethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
cis-1,2-dichloroethene		< 5	**8.8 J**	**5.4**	**0.47 J**	**2.3 J**	**0.65 J**	< 5	**0.27 J**
cis-1,3-dichloropropene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Dibromochloromethane		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Ethylbenzene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Methylene Chloride		< 5	< 13	< 5	< 5	< 13 B	< 5	< 5	< 5
Styrene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Tetrachloroethene		**5.1**	**4.8 J**	**9**	**7.5**	**16**	< 5	< 5	**0.56 J**
Toluene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
trans-1,2-dichloroethene		< 5	< 13	**0.43 J**	< 5	< 13	< 5	< 5	< 5
trans-1,3-dichloropropene		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Trichloroethylene		**42**	**310**	**200 D**	**91**	**440**	**27**	**1.1 J**	**56**
Trichlorotrifluoroethane (Freon 113)		**17**	**6.6 J**	**1.7 J**	**1.1 J**	**2.7 J**	**1.6 J**	< 5	< 5
Vinyl Chloride		< 2	< 5	< 2	< 2	< 5	< 2	< 2	< 2
Xylene-o		< 5	< 13	< 5	< 5	< 13	< 5	< 5	< 5
Xylenes - m,p		< 5	< 13	**0.23 J**	< 5	< 13	< 5	< 5	< 5
		64	**340**	**220**	**100**	**470**	**33**	**1.1**	**57**

See last page notes and abbreviations.

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Table 2. Concentrations of Volatile Organic Compounds Detected in Monitoring Wells and Groundwater Remedial Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	GM-73D GM-73D 8/27/2012	GM-73D2 GM-73D2 8/27/2012	GM-74I GM-74I 8/28/2012	GM-74D GM-74D 8/28/2012	GM-74D2 GM-74D2 8/28/2012	GM-74D REP082812 8/28/2012	GM-75D2 GM-75D2 9/6/2012	GM-79I GM-79I 9/5/2012
1,1,1-Trichloroethane		< 5	**0.51 J**	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane		< 5	**0.97 J**	< 5	< 5	**0.46 J**	< 5	< 5	< 5
1,1-Dichloroethene		< 5	**1.9 J**	< 5	< 5	**0.56 J**	< 5	**0.31 J**	< 5
1,2-Dichloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone (MEK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone (MBK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone (MIK)		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene		< 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
Bromoform		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		< 5	**0.95 J**	< 5	< 5	**0.22 J**	< 5	< 5	< 5
cis-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		< 5	**2.3 J**	< 5	**0.31 J**	**4.1 J**	**0.32 J**	**2.1 J**	< 5
Toluene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene		**8.9**	**60**	**0.34 J**	**1.4 J**	**6.3**	**1.5 J**	**35**	< 5
Trichlorotrifluoroethane (Freon 113)		< 5	**0.48 J**	< 5	< 5	**0.56 J**	< 5	**0.7 J**	< 5
Vinyl Chloride		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
		8.9	**67**	**0.34**	**1.7**	**12**	**1.8**	**38**	0

See last page notes and abbreviations.

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Table 2. Concentrations of Volatile Organic Compounds Detected in Monitoring Wells and Groundwater Remedial Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	GM-79D / GM-79D / 9/5/2012	N-10631 / N-10631 / 9/6/2012	96 EFFLUENT / 96 EFFLUENT / 8/27/2012	WELL 1 / WELL 1 / 8/27/2012	WELL 3 / WELL 3 / 8/27/2012	102 EFFLUENT / 102 EFFLUENT / 8/27/2012	WELL 17 / WELL 17 / 8/27/2012
1,1,1-Trichloroethane		< 5	< 5	< 5	**0.53 J**	< 50	< 5	**0.52 J**
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
1,1,2-Trichloroethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
1,1-Dichloroethane		< 5	< 5	< 5	**0.68 J**	< 50	< 5	**1.1 J**
1,1-Dichloroethene		< 5	< 5	< 5	**0.93 J**	**8.9 J**	< 5	**2.1 J**
1,2-Dichloroethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
1,2-Dichloropropane		< 5	< 5	**0.2 J**	**5.6 J**	< 50	< 5	< 10
2-Butanone (MEK)		< 50	< 50	< 50	< 130	< 500	< 50	< 100
2-Hexanone (MBK)		< 50	< 50	< 50	< 130	< 500	< 50	< 100
4-methyl-2-pentanone (MIK)		< 50	< 50	< 50	< 130	< 500	< 50	< 100
Acetone		< 50	< 50	< 50	< 130	< 500	< 50	< 100
Benzene		< 0.7	< 0.7	< 0.7	< 1.8	< 7	< 0.7	< 1.4
Bromodichloromethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Bromoform		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Bromomethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Carbon Disulfide		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Carbon Tetrachloride		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Chlorobenzene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Chloroethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Chloroform		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Chloromethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
cis-1,2-dichloroethene		< 5	**0.23 J**	< 5	**3.6 J**	**9.6 J**	< 5	**4.4 J**
cis-1,3-dichloropropene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Dibromochloromethane		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Ethylbenzene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Methylene Chloride		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Styrene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Tetrachloroethene		**0.6 J**	< 5	< 5	**46**	**53**	< 5	**31**
Toluene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
trans-1,2-dichloroethene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
trans-1,3-dichloropropene		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Trichloroethylene		**18**	**0.59 J**	**0.98 J**	**350**	**1500**	**0.99 J**	**210**
Trichlorotrifluoroethane (Freon 113)		< 5	< 5	< 5	**2.9 J**	**8.1 J**	< 5	**4.6 J**
Vinyl Chloride		< 2	< 2	< 2	< 5	**110**	< 2	< 4
Xylene-o		< 5	< 5	< 5	< 13	< 50	< 5	< 10
Xylenes - m,p		< 5	< 5	< 5	< 13	< 50	< 5	< 10
		19	**0.82**	**1.2**	**410**	**1700**	**0.99**	**250**

See last page notes and abbreviations.

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Table 2. Concentrations of Volatile Organic Compounds Detected in Monitoring Wells and Groundwater Remedial Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	WELL 18 / WELL 18 / 8/27/2012	WELL 19 / WELL 19 / 8/27/2012
1,1,1-Trichloroethane		**0.96 J**	**0.55 J**
1,1,2,2-Tetrachloroethane		< 5	< 5
1,1,2-Trichloroethane		< 5	< 5
1,1-Dichloroethane		**1.2 J**	**0.94 J**
1,1-Dichloroethene		**3.8 J**	**1.4 J**
1,2-Dichloroethane		< 5	**0.64 J**
1,2-Dichloropropane		< 5	< 5
2-Butanone (MEK)		< 50	< 50
2-Hexanone (MBK)		< 50	< 50
4-methyl-2-pentanone (MIK)		< 50	< 50
Acetone		< 50	< 50
Benzene		< 0.7	< 0.7
Bromodichloromethane		< 5	< 5
Bromoform		< 5	< 5
Bromomethane		< 5	< 5
Carbon Disulfide		< 5	< 5
Carbon Tetrachloride		< 5	< 5
Chlorobenzene		< 5	< 5
Chloroethane		< 5	< 5
Chloroform		**0.27 J**	**0.53 J**
Chloromethane		< 5	< 5
cis-1,2-dichloroethene		**1.8 J**	**21**
cis-1,3-dichloropropene		< 5	< 5
Dibromochloromethane		< 5	< 5
Ethylbenzene		< 5	< 5
Methylene Chloride		< 5	< 5
Styrene		< 5	< 5
Tetrachloroethene		**13**	**6.6**
Toluene		< 5	< 5
trans-1,2-dichloroethene		< 5	**0.31 J**
trans-1,3-dichloropropene		< 5	< 5
Trichloroethylene		**62**	**170**
Trichlorotrifluoroethane (Freon 113)		**1.2 J**	**0.84 J**
Vinyl Chloride		< 2	< 2
Xylene-o		< 5	< 5
Xylenes - m,p		< 5	< 5
		84	**200**

Note: Results rounded to two significant figures.

Bold	Constituent detected
VOCs	Volatile Organic Compounds
ug/L	Micrograms per liter
J	Constituent value is estimated
B	Constituent also detected in an associated blank sample
D	Result from secondary dilution

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Table 3. Concentrations of Site-Related Volatile Organic Compounds Detected in Outpost Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	BPOW 1-1 / BPOW 1-1 / 8/20/2012	BPOW 1-2 / BPOW 1-2 / 8/20/2012	BPOW 1-3 / BPOW 1-3 / 8/21/2012	BPOW 1-4 / BPOW 1-4 / 8/29/2012	BPOW 1-5 / BPOW 1-5 / 8/29/2012	BPOW 1-6 / BPOW 1-6 / 8/31/2012	BPOW 2-1 / BPOW 2-1 / 8/21/2012	BPOW 2-3 / BPOW 2-3 / 8/31/2012	BPOW 3-1 / BPOW 3-1 / 8/23/2012	BPOW 3-2 / BPOW 3-2 / 8/23/2012	BPOW 3-3 / BPOW 3-3 / 9/4/2012
1,1,1-Trichloroethane		**0.2 J**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-dichloroethene		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorotrifluoroethane (Freon 113)		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-dichloroethene		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene		**0.95**	**0.3 J**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Site-Related VOCs [1] :		**1.6[3]**	**0.3[3]**	**0**	0	0	0	0	0	**0**	**0**	0
TVOC Trigger Value [2]:		**0.6**	**0.6**	**0.6**	**NE**	**NE**	**NE**	**NE**	**NE**	**1.5**	**1.5**	**NE**

See last page for notes and abbreviations.

Table 3. Concentrations of Site-Related Volatile Organic Compounds Detected in Outpost Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	BPOW 3-4 / BPOW 3-4 / 9/4/2012	BPOW 4-1 / BPOW 4-1 / 8/24/2012	BPOW 4-2 / BPOW 4-2 / 8/24/2012
1,1,1-Trichloroethane		< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane		< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane		**0.48 J**	< 0.5	< 0.5
1,1-Dichloroethane		< 0.5	< 0.5	< 0.5
1,1-Dichloroethene		< 0.5	< 0.5	< 0.5
1,2-Dichloroethane		< 0.5	< 0.5	< 0.5
Carbon tetrachloride		**1**	< 0.5	< 0.5
Chlorobenzene		< 0.5	< 0.5	< 0.5
Chloroform		**0.98**	< 0.5	< 0.5
cis-1,2-dichloroethene		**0.67**	< 0.5	< 0.5
Trichlorotrifluoroethane (Freon 113)		**0.23 J**	**1.7**	**0.87**
Tetrachloroethene		< 0.5	< 0.5	< 0.5
trans-1,2-dichloroethene		< 0.5	< 0.5	< 0.5
Trichloroethylene		**58 D**	< 0.5	< 0.5
Total Site-Related VOCs [(1)] :		**61**	**1.7 [(4)]**	**0.87**
TVOC Trigger Value [(2)]:		**NE**	**1.5**	**1.5**

Note: Outpost wells OW2-2 was not sampled by Northrop Grumman this round, due to significant drawdown during purging indicating possible well fouling.

Wells BPOW1-4, BPOW1-5, BPOW1-6, BPOW3-3, and BPOW3-4 are currently monitoreed by Northrop Grumman on a voluntary basis. The screen intervals for these wells were selected by the Navy based on data obtained from vertical profile borings VP-127 (BPOW-1 cluster) and VP-128 (BPOW-3 cluster).

(1) Site-related VOCs were established for the wells identified above in the Public Water Supply Contingency Plan (PWSCP) (ARCADIS G&M, Inc. 2003).

(2) TVOC Trigger Values were established for Wells BPOW1-1, BPOW1-2, BPOW1-3, BPOW3-1, BPOW3-2, BPOW4-1, and BPOW4-2 in the PWSCP (ARCADIS G&M, Inc. 2003).

(3) The TVOC Trigger Value for Cluster 1 was initially exceeded on April 23, 2004; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003).

(4) The TVOC Trigger Value for BPOW 4-1 was initially exceeded on March 1, 2012; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003).

Bold Constituent detected
TVOC Total Volatile Organic Compounds
NE Trigger Value Not Established
J Value is estimated
D Result from secondary dilution

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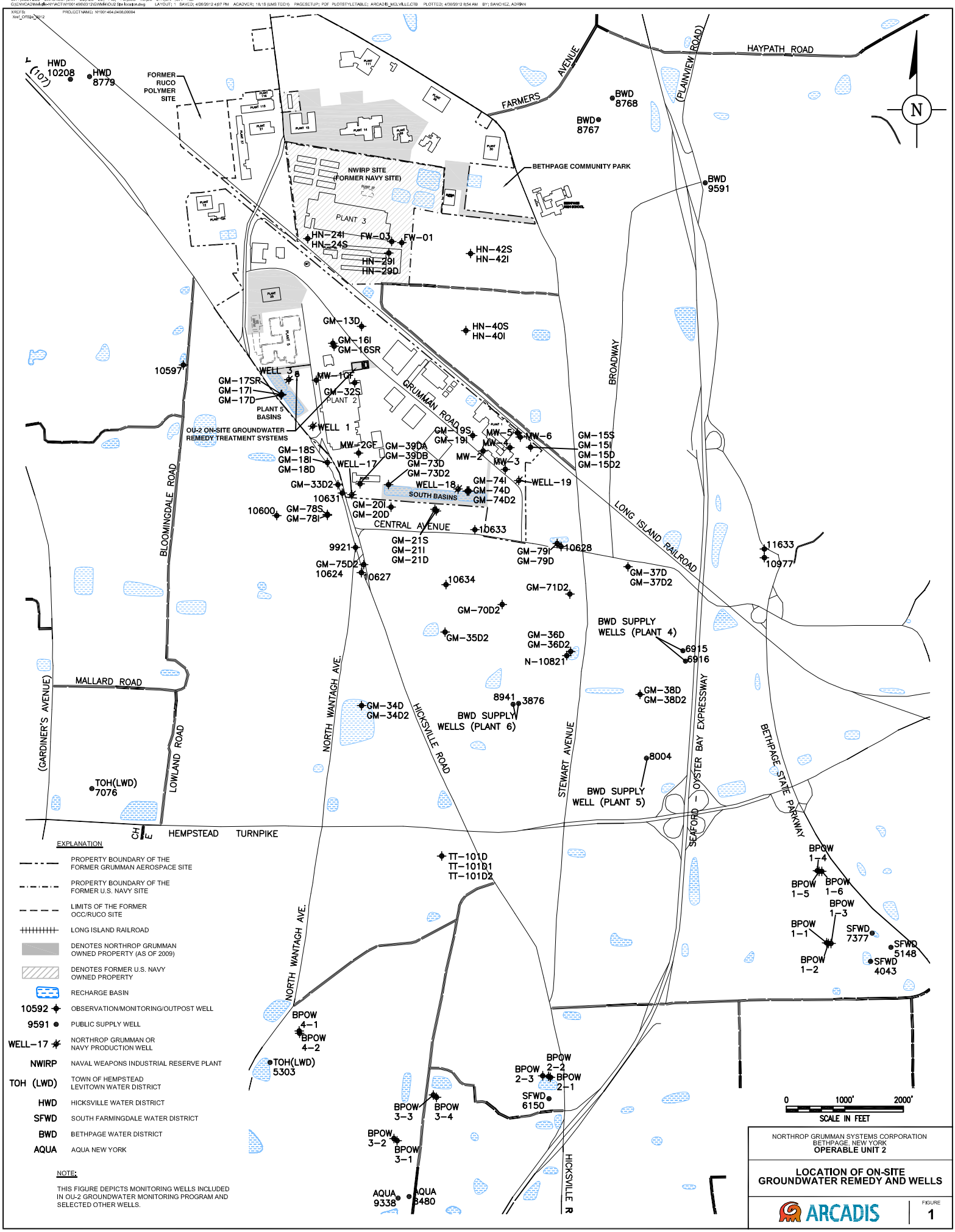
Table 4. Concentrations of Total and Dissolved Cadmium and Chromium Detected in Monitoring Wells, Third Quarter 2012, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	Well: / Sample ID: / Date:	GM-15SR GM-15SR 9/11/2012	MW-01GF MW-01GF 9/12/2012	MW-02GF MW-02GF 9/12/2012	N-10631 N-10631 9/6/2012	PT1 MW-04 PT1 MW-04 9/12/2012	PT1 MW-05 PT1 MW-05 9/12/2012	PT1 MW-06 PT1 MW-06 9/12/2012
Cadmium		--	< 5 U	< 5 U	< 5 U	--	--	**--**
Cadmium (Dissolved)		--	< 5 U	< 5 U	< 5 U	--	--	--
Chromium		**603**	**208**	**167**	**16**	< 10 U	**382**	< 10 U
Chromium (Dissolved)		--	< 10 U	**171**	**12**	**--**	--	**--**

ug/L Micrograms per liter
Bold Constituent detected above IDL.
-- Not analyzed



EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF THE FORMER U.S. NAVY SITE
- LIMITS OF THE FORMER OCC/RUCO SITE
- LONG ISLAND RAILROAD
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY (AS OF 2009)
- DENOTES FORMER U.S. NAVY OWNED PROPERTY
- RECHARGE BASIN
- 10592 — OBSERVATION/MONITORING/OUTPOST WELL
- 9591 — PUBLIC SUPPLY WELL
- WELL-17 — NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
- NWIRP — NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- TOH (LWD) — TOWN OF HEMPSTEAD LEVITOWN WATER DISTRICT
- HWD — HICKSVILLE WATER DISTRICT
- SFWD — SOUTH FARMINGDALE WATER DISTRICT
- BWD — BETHPAGE WATER DISTRICT
- AQUA — AQUA NEW YORK

NOTE:

THIS FIGURE DEPICTS MONITORING WELLS INCLUDED IN OU-2 GROUNDWATER MONITORING PROGRAM AND SELECTED OTHER WELLS.

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

LOCATION OF ON-SITE GROUNDWATER REMEDY AND WELLS

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FIGURE 1