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ENVIRONMENT

Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Remedial Action, Bureau A
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Subject:
Work Plan for the Baseline Groundwater Sampling Event, Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds) Bethpage, New York.

Date:
April 14, 2009

Contact:
David Stern

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631-391-5284

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david.stern@arcadis-us.com

Our ref:
NY001493.0909.00003

Dear Mr. Scharf:

ARCADIS is submitting this Work Plan for the Baseline Groundwater Sampling Event on behalf of the Northrop Grumman Systems Corporation (Northrop Grumman). This Work Plan describes water-level measurements and groundwater sampling associated with the OU3 Groundwater Interim Remedial Measure (IRM) (currently under construction on the Northrop Grumman Plant 24 Access Road). Figure 1 depicts the site location (Site is defined as the Bethpage Community Park and former Northrop Grumman Plant 24 Access Road that abuts the Park to the south and west).

The objectives of the Baseline Sampling Event are as follows:

- Determine and document the on-site groundwater flow direction prior to the startup of the Groundwater IRM.
- Determine and document current groundwater quality at locations on-site, hydraulically upgradient and immediately downgradient of the southern Site boundary, in proximity to the Groundwater IRM.

Sampling Scope

The Baseline Sampling Event includes hydraulic (water-level) measurements and groundwater quality sampling. A total of 35 wells are included in the hydraulic measurement network (17 monitoring wells, the four Groundwater IRM recovery wells, and 14 hydraulic piezometers). A total of 21 wells are included in the groundwater quality sampling network (17 monitoring wells and the four recovery wells). Table 1 summarizes the wells included in the Baseline Sampling Event for hydraulic measurement and groundwater sampling purposes. Figure 2 is a site plan

that shows the wells included in the Baseline Sampling Event.

Water Level Measurement Methodology

Water-levels will be measured to the nearest hundredth of a foot (.01 ft) (using a decontaminated water level indicator) in the wells in the hydraulic measurement network (Table 1), consistent with NYSDEC-approved OU3 RI/FS procedures. Additional water-level measurement protocols/requirements are described in the Field Sampling Plan (FSP) (see Appendix A of the OU3 RI/FS Work Plan) (ARCADIS 2006).

Groundwater Sampling Methodology

Well evacuation and groundwater sample collection will be performed consistent with methods previously approved by the NYSDEC in the FSP (see Appendix A of the 2006 RI/FS Work Plan) (ARCADIS 2006). ARCADIS will utilize the existing NYSDEC-approved laboratory for this phase of work (Columbia Analytical Services).

Decontamination and waste disposal associated with this event will be performed consistent with methods, previously approved by the NYSDEC, in the FSP. In keeping with past approved practices, waters generated during the sampling event will be disposed of at the Nassau County Publicly Owned Treatment Works (POTW) intake, located on Northrop Grumman property.

The portion of field work on Town of Oyster Bay (Town) property will be conducted in accordance with the existing Site Operations Plan submitted to the Town at the initiation of the RI.

Baseline Sampling Event groundwater samples will be analyzed for the Target Compound List (TCL) volatile organic compounds (VOCs), including Freon 12 and Freon 22 using NYSDEC Analytical Services Protocol (ASP) 2000 Method OLM 4.2, as specified in the Quality Assurance Project Plan (QAPP) (see Appendix B of the 2006 RI/FS Work Plan). Wells will be also analyzed for total and dissolved cadmium and chromium (groundwater samples from a subset of wells will also be analyzed for total and dissolved manganese and iron, see Table 1 for details) using NYSDEC ASP Method OLM 4.0. Laboratory analysis methodologies will be performed consistent with the OU3 RI/FS Work Plan QAPP (see Appendix B of the RI/FS Work Plan).

Quality assurance/quality control (QA/QC) samples to be collected as part of the Baseline Sampling Event will include blind duplicates, matrix spike/matrix spike duplicates (MS/MSD), field (equipment) blanks, and trip blanks. QA/QC samples will be collected and data validation will be performed in accordance with the OU3 RI/FS Work Plan QAPP.

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Baseline Analysis Report

After completion of the Baseline Sampling Event, the Baseline Analysis Report will be prepared and submitted to the NYSDEC. The report will include a description of the work performed, along with tabulated validated groundwater quality data, tabulated water-level measurement data, and a figure depicting the horizontal direction of groundwater flow.

Estimated Schedule

The Baseline Sampling Event is expected to be performed in April 2009, contingent on NYSDEC approval. The work will be coordinated with ongoing construction of the Groundwater IRM. It is expected that the program will require one week to complete. The Baseline Analysis Report will be prepared and submitted subsequent to receipt of the validated analytical results from the groundwater samples. The current expected date of Groundwater IRM startup is May 8, 2009.

We would appreciate NYSDEC written approval of this work plan as soon as possible. If you have any questions or comments, please feel free to contact us.

Sincerely,

ARCADIS

David E. Stern
Senior Hydrogeologist

Michael F. Wolfert
Project Director

Enclosures

Copies:
John Cofman, Northrop Grumman
Kent A. Smith, Northrop Grumman
Gary Litwin, NYSDOH
Robert Weitzman, NCDOH
Peter A. Scully, NYSDEC Region 1
Rosalie K. Rusinko, Esq., NYSDEC
File Repository (Bethpage Public Library)

Table 1. Well Network for Groundwater Interim Remedial Measure Baseline Groundwater Sampling Event, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York .

Well ID	Land Surface Elevation (ft msl)	Screen Elevation Top (ft msl)	Screen Elevation Bottom (ft msl)	Well Diameter (inches)	Depth to Screen Top (ft bls)	Depth to Screen Bottom (ft bls)	Screen Length (ft)	Well Depth (ft)	Well Casing/ Screen Materials	Proposed Activity/Analysis[1]
Monitoring Wells										
BCPMW-1	125.73	65.73	50.73	2	60	75	15	75	Sch. 40 PVC	Water Levels/VOC/Cd/Cr
BCPMW-2	126.39	66.39	51.39	2	60	75	15	75	Sch. 40 PVC	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-3	124.94	65.94	50.94	2	59	74	15	74	Sch. 40 PVC	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-4-1	128.71	83.71	63.71	4	45	65	20	70	Sch. 40 PVC	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-4-2	129.33	60.83	45.83	4	68.5	83.5	15	88.5	Sch. 40 PVC	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-4-3	129.2	14.2	4.20	4	115	125	10	130	Sch. 40 PVC	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-5-1	129.37	79.37	64.37	4	50	65	15	70	Sch. 80 PVC/ SS	Water Levels/VOC/Cd/Cr/Fe/Mn
BCPMW-6-1	126.01	37.51	27.51	4	88.5	98.5	10	103.5	Sch. 40 PVC	Water Levels/VOC/Cd/Cr
BCPMW-6-2	125.16	-7.84	-17.84	4	133	143	10	148	Sch. 40 PVC	Water Levels/VOC/Cd/Cr
BCPMW-7-1	124.81	34.81	24.81	4	90	100	10	105	Sch. 40 PVC	Water Levels/VOC/Cd/Cr
B24MW-2	126.96	72.96	52.96	2	54	74	20	74	PVC	Water Levels/VOC/Cd/Cr
B24MW-3	127.11	72.11	57.11	2	55	70	15	70	PVC	Water Levels/VOC/Cd/Cr
B30MW-1	128.33	71.33	56.33	2	57	72	15	72	PVC	Water Levels/VOC/Cd/Cr
MW-200-1	125 [2]	40	30.00	4	85	95	10	100	Sch. 40 PVC/ SS	Water Levels/VOC/Cd/Cr
MW-201-1	125 [2]	55	45.00	4	70	80	10	85	Sch. 40 PVC/ SS	Water Levels/VOC/Cd/Cr
MW-202-1	125 [2]	0	-10.00	4	125	135	10	140	Sch. 40 PVC/ SS	Water Levels/VOC/Cd/Cr
MW-203-1	125 [2]	22	12.00	4	103	113	10	118	Sch. 40 PVC/ SS	Water Levels/VOC/Cd/Cr
Recovery Wells										
RW-01	125 [2]	17	-3	8	108	128	20	134	Sch. 80 PVC/SS	Water Levels/VOC/Cd/Cr/Fe/Mn
RW-02	125 [2]	41	21	6	84	104	20	104	Steel/SS	Water Levels/VOC/Cd/Cr/Fe/Mn
RW-03	125 [2]	41	21	8	84	104	20	107	Sch. 80 PVC/SS	Water Levels/VOC/Cd/Cr/Fe/Mn
RW-04	125 [2]	15	-5	8	110	130	20	133	Sch. 80 PVC/SS	Water Levels/VOC/Cd/Cr/Fe/Mn

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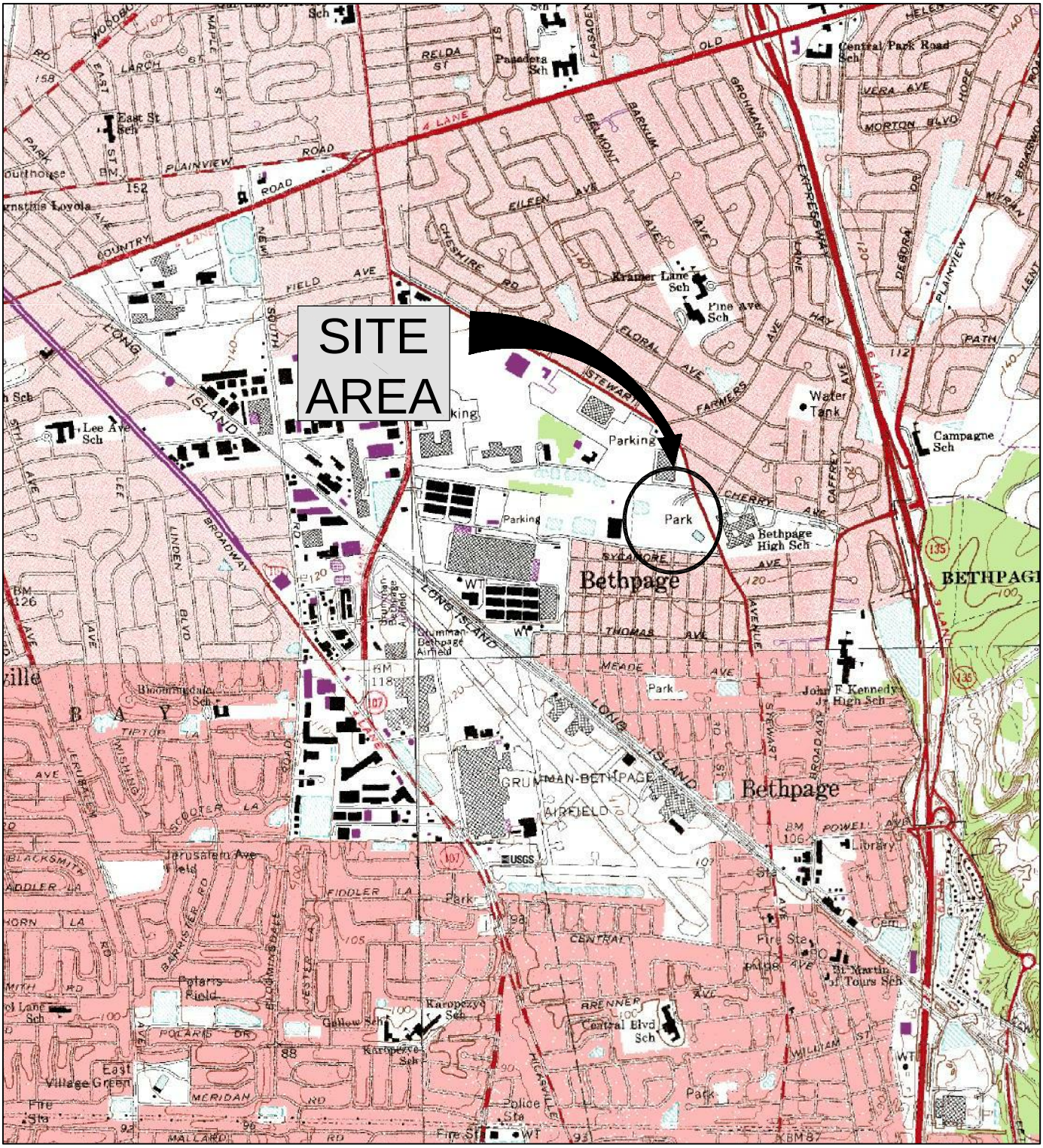
Well ID	Land Surface Elevation (ft msl)	Screen Elevation Top (ft msl)	Screen Elevation Bottom (ft msl)	Well Diameter (inches)	Depth to Screen Top (ft bls)	Depth to Screen Bottom (ft bls)	Screen Length (ft)	Well Depth (ft)	Well Casing/ Screen Materials	Proposed Activity/Analysis[1]
Groundwater Piezometers										
PZ-01a	125 [2]	65	60	2	60	65	5	68	Sch. 40 PVC	Water Levels Only
PZ-01b	125 [2]	45	40	1	80	85	5	88	Sch. 40 PVC	Water Levels Only
PZ-01c	125 [2]	-5	-10	1	130	135	5	138	Sch. 40 PVC	Water Levels Only
PZ-02a	125 [2]	65	60	2	60	65	5	68	Sch. 40 PVC	Water Levels Only
PZ-02b	125 [2]	45	40	1	80	85	5	85	Sch. 40 PVC	Water Levels Only
PZ-02c	125 [2]	-5	-10	1	130	135	5	138	Sch. 40 PVC	Water Levels Only
PZ-03	125 [2]	45	40	1	80	85	5	88	Sch. 40 PVC	Water Levels Only
PZ-04	125 [2]	45	40	1	80	85	5	88	Sch. 40 PVC	Water Levels Only
PZ-05a	125 [2]	60	55	2	65	70	5	74	Sch. 40 PVC	Water Levels Only
PZ-05b	125 [2]	15	10	1	110	115	5	117	Sch. 40 PVC	Water Levels Only
PZ-06a	125 [2]	60	55	2	65	70	5	72	Sch. 40 PVC	Water Levels Only
PZ-06b	125 [2]	35	30	1	90	95	5	97	Sch. 40 PVC	Water Levels Only
PZ-07a	125 [2]	60	55	2	65	70	5	72	Sch. 40 PVC	Water Levels Only
PZ-07b	125 [2]	12	7	1	113	118	5	120	Sch. 40 PVC	Water Levels Only

Notes and Abbreviations

(1) VOCs: TCL VOCs using NYSDEC ASP 2000 Method OLM 4.2 with Freon 12 and 22
Cd: Cadmium using USEPA Method ILM 4.0, both total and dissolved
Cr: Chromium using USEPA Method ILM 4.0, both total and dissolved
Fe: Iron using USEPA Method ILM 4.0, both total and dissolved
Mn: Manganese using USEPA Method ILM 4.0, both total and dissolved

(2) Land Surface Estimated

Sch 80 PVC: schedule 80 polyvinyl chloride
Sch. 40 PVC: schedule 40 polyvinyl chloride
SS: stainless steel
Steel: low carbon steel
ft: feet
ft msl: feet relative to mean sea level
ft bls: feet below land surface
TCL: Target Compound List
TAL: Target Analyte List



SOURCE:
USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, NY. 1994
USGS 7.5 MIN. FREEPORT QUADRANGLE, FREEPORT, NY., 1994
USGS 7.5 MIN. HICKSVILLE QUADRANGLE, HICKSVILLE, NY., 1967, PHOTOREVISED 1979
USGS 7.5 MIN. HUNTINGTON QUADRANGLE, HUNTINGTON, NY. 1967, PHOTOREVISED 1979

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS

SITE AREA LOCATION

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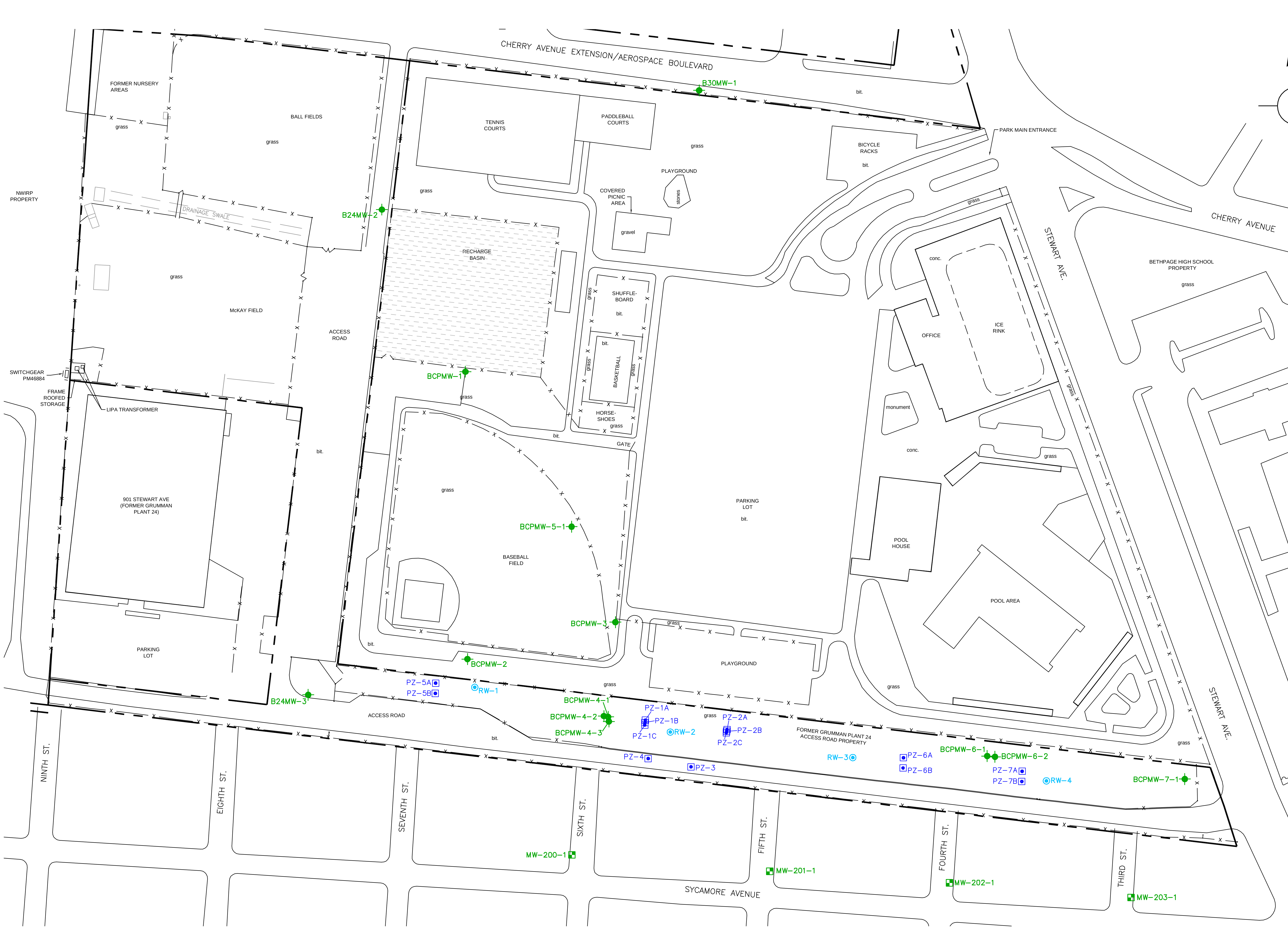
FIGURE
1



0 100' 200'

SCALE IN FEET

LEGEND:

	NORTHROP GRUMMAN PROPERTY LINE
	FENCE
	BASIN
bit.	BITUMINOUS PAVEMENT
BCPMW-1	MONITORING WELL
MW-200-1	MONITORING WELL
PZ-2C	PIEZOMETER
RW-2	RECOVERY WELL

NOTES:

1. MONITORING WELLS, BCPMW-1, 2, 3, 4-1, 4-2, 4-3, 5-1, 6-1, 6-2, 7-1, B24MW-2, B24MW-3, B30MW-1 SURVEYED TO NORTH AMERICAN DATUM (NAD) 83. ALL OTHER MONITORING WELLS, RECOVERY WELLS, AND PIEZOMETERS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
2. PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

WELL NETWORK FOR GROUNDWATER IRM EFFECTIVENESS MONITORING

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FIGURE **2**