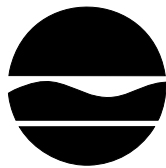


Update on Operable Unit 3 Remedial Investigation/ Interim Remedial Measures

Bethpage Community Park
June 27, 2007

NEW YORK STATE
DEPARTMENT OF



ENVIRONMENTAL
CONSERVATION



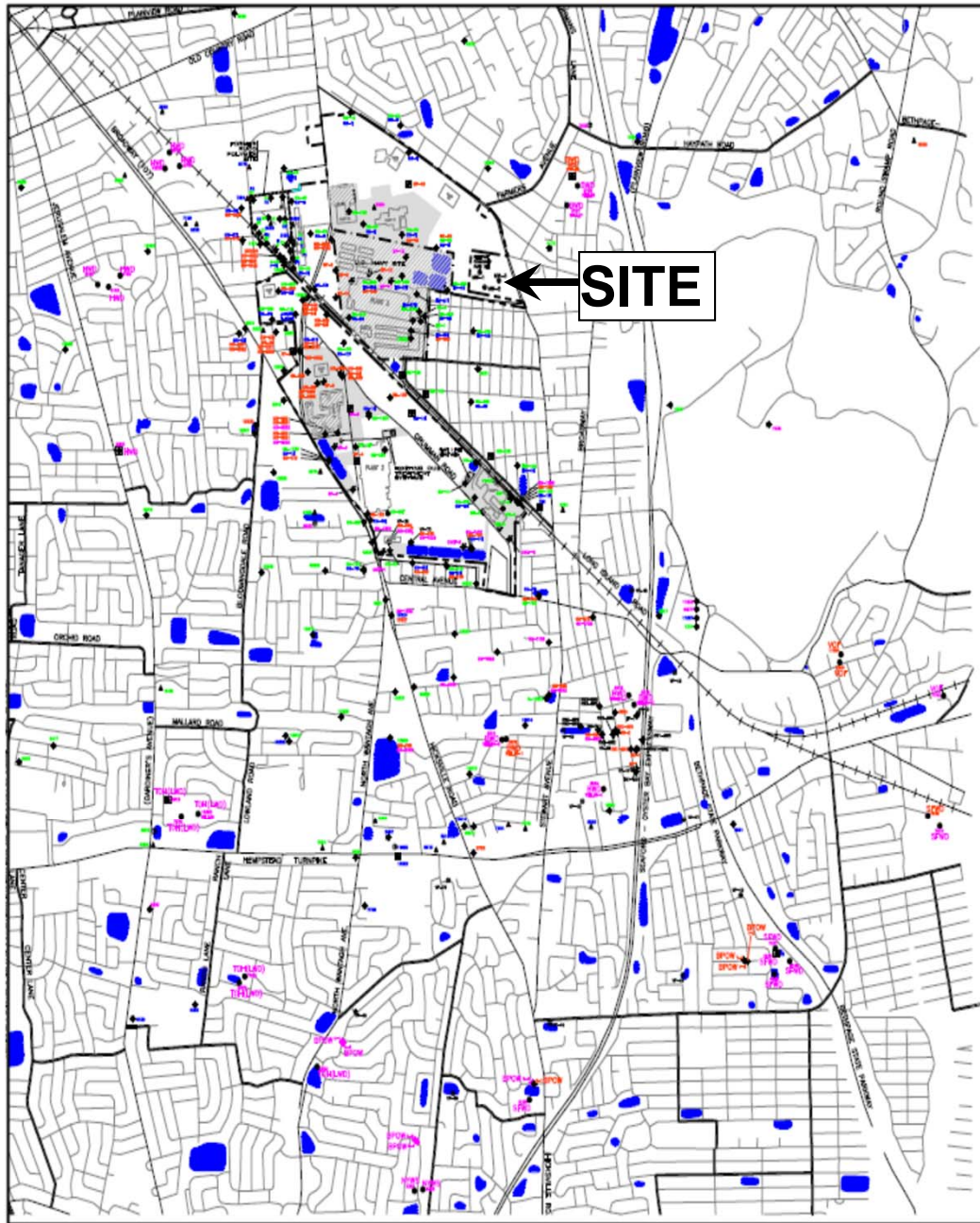
STATE OF NEW YORK
DEPARTMENT OF HEALTH

Why Are We Here Today?

- Northrop Grumman signed an Order on Consent (AOC) to investigate environmental conditions related to the Bethpage Community Park.
- The approved Remedial Investigation (RI) / Feasibility Study (FS) is currently being implemented, as follows:
 - RI field work has been completed in the Park and is continuing on adjacent Northrop Grumman property.
 - RI field work is ongoing in neighborhoods south of the Park
 - The RI Report for the Park is being prepared
- Northrop Grumman will implement two Interim Remedial Measures (IRMs) (soil gas and groundwater).
- The IRM Work Plan for soil gas has been approved by NYSDEC and the work is currently underway. The IRM Work Plan for groundwater is currently under development.
- The NYS-funded vapor intrusion study will be discussed.
- A chronology of work related to the Park will be provided today.
- Representatives of NYS are here to answer questions.

Parties Involved

- The NYS Department of Environmental Conservation (DEC), along with State and County Departments of Health (DOH) are the participating regulatory agencies.
- Northrop Grumman and the Town of Oyster Bay are the identified potentially responsible parties.
- This session focuses on work performed pursuant to the Northrop Grumman RI/FS Work Plan and the Soil Gas IRM Work Plan.



EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUHAM KITCHEN SITE
- PROPERTY BOUNDARY OF U.S. NAVY SITE
- ▨ IDENTIFIED NORTHROP GRUHAM OWNED PROPERTY
- ▨ IDENTIFIED U.S. NAVY OWNED PROPERTY
- WELLS
- I.A. INDUSTRIAL WELL
- P.S. PUBLIC SUPPLY WELL
- O.O. OBSERVATION MONITORING WELL
- E.W. EXHAUSTION WELL
- U.U. UNKNOWN USE OF WELL
- N.O. NORTHROP GRUHAM OR NAVY PROMOTION/PROMOTIONAL WELL OR OLD FEDERAL WELL
- V.P. EXISTING VERTICAL PROFILE BORING
- A.W. ABANDONED OR DECEASED WELL
- M.W. MONITORING WELL APPROXIMATE
- F.W. FLECTION WELL
- SHALLOW WELLS
- INTERMEDIATE WELLS
- DEEP WELLS
- DEEP 2 AND DEEP 3 WELLS
- SWD SOUTH PARANISHALE WATER DISTRICT
- LWD LORETTA WATER DISTRICT
- NYS NEW YORK WATER SERVICE
- WD WATER DISTRICT
- YH YORK WATER DISTRICT
- MD METRO WATER DISTRICT
- WV WASHINGTON WATER DISTRICT
- VF VERMONT WATER DISTRICT
- VP VERTICAL PROFILE BORING

NOTES:

1. THIS FRAME DOES NOT INCLUDE ALL ACTIVE MONITORING AND OBSERVATION WELLS INSTALLED SINCE 1995.
2. THIS FRAME INCLUDES ALL SHALLOW WELLS LOCATED ON TABLE 1-1 OF THE OTHER 2000 FS REPORT PLUS SELECT ADDITIONAL MONITORING AND OBSERVATION WELLS.
3. THIS FRAME INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION REQUESTED BY AGENCY IN SEPTEMBER 2001 LETTER.
4. THIS FRAME INCLUDES LOCATIONS OF VERTICAL PROFILE BORINGS INSTALLED BY THE US NAVY.
5. BATH LOCATIONS OBTAINED FROM 1955 TOPOGRAPHIC MAPS (BARSBLE, HARTVILLE, HENNINGTON, AND FREEMONT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUHAM.
6. NORTHROP GRUHAM PROPERTY BOUNDARIES BASED ON DATA PROVIDED IN SEPTEMBER 2000.
7. LOCATION OF MONITORING WELLS INSTALLED BY DURVA IS INDICATED AT POINT 1 (E., W-1-1 TO W-1-4) AND ESTIMATED FROM GME SITE PLAN, PROVIDED ON DECEMBER 19, 2000.
8. THIS FRAME INCLUDES LOCATIONS OF WELLS ASSOCIATED WITH THE 19-30 WICK MILITARY ACTION, PERFORMED BY THE NAVY.



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NO. 1000 (4)	REVISION (03/09)	PL/DB
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PROJECT TITLE
 NORTHROP GRUHAM CORPORATION
 BETHPAGE, NEW YORK

PROJECT TITLE
 LOCATION OF NORTHROP GRUHAM,
 U.S. NAVY & RUCO POLYMER SITES
 AND LOCATIONS OF WELLS



The Kadison Group
 Suite 100
 1000 N. 17th
 Ft. Worth, TX 76107
 Tel: 817-342-7800 Fax: 817-342-7810
 www.kadison.com

PROJECT MANAGER C. SAN GONNINI	DESIGNED BY D. STON
DATE OF THIS REPORT 03/01	DRAWN BY A. SANCHEZ
PROJECT NUMBER NY001348	DRAWING NUMBER 1

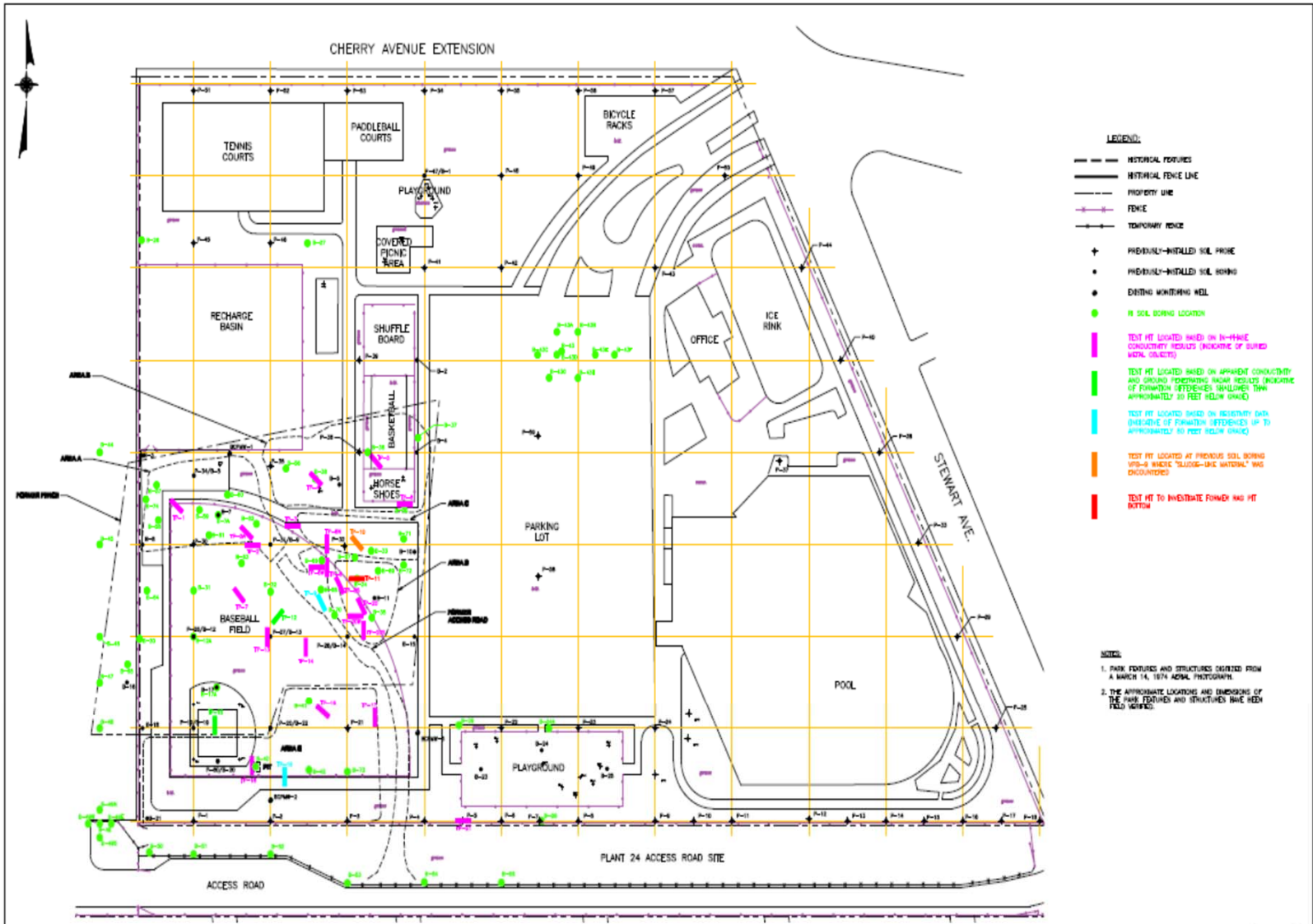
ALL COORDINATES REFERENCED TO NAD83 UNADJUSTED DATUM BOUND



Project Area – December 2004

Key Dates

- 2004: NYSDEC designates Bethpage Park as Operable Unit 3 (OU3)
- July 2004 – June 2005: Phase 1 of the RI performed pre-Administrative Order on Consent (AOC)
- June 2005: OU3 AOC signed
- August 2005: Draft RI/FS Work Plan
- March 2006: Final RI/FS Work Plan
- April to December 2006: Phase 2 RI
- January 2007 to present: Phase 3 RI
- February 2007: Soil Gas IRM Work Plan



- LEGEND:**
- HISTORICAL FEATURES
 - - - HISTORICAL FENCE LINE
 - - - PROPERTY LINE
 - FENCE
 - - - TEMPORARY FENCE
 - + PREVIOUSLY-INSTALLED SOIL PROBE
 - PREVIOUSLY-INSTALLED SOIL BORING
 - EXISTING WASTEWATER WELL
 - SOIL BORING LOCATION
 - TEST PIT LOCATED BASED ON IN-HOUSE CONDUCTIVITY RESULTS (INDICATIVE OF BURIED METAL OBJECTS)
 - TEST PIT LOCATED BASED ON APPARENT CONDUCTIVITY AND GROUND PENETRATING RADAR RESULTS (INDICATIVE OF FOUNDATION MEMBERS) (SHALLOWER THAN APPROXIMATELY 30 FEET BELOW GROUND)
 - TEST PIT LOCATED BASED ON RESISTIVITY DATA (INDICATIVE OF FOUNDATION MEMBERS) (UP TO APPROXIMATELY 60 FEET BELOW GROUND)
 - TEST PIT LOCATED AT PREVIOUS SOIL BORING VOID-A BATTLE "SLUDGE-LIKE MATERIAL" WAS ENCOUNTERED
 - TEST PIT TO INVESTIGATE FINDER AND PIT BOTTOM

- NOTES:**
1. PARK FEATURES AND STRUCTURES DERIVED FROM A MARCH 14, 1974 AERIAL PHOTOGRAPH.
 2. THE APPROXIMATE LOCATIONS AND DIMENSIONS OF THE PARK FEATURES AND STRUCTURES HAVE BEEN FIELD VERIFIED.

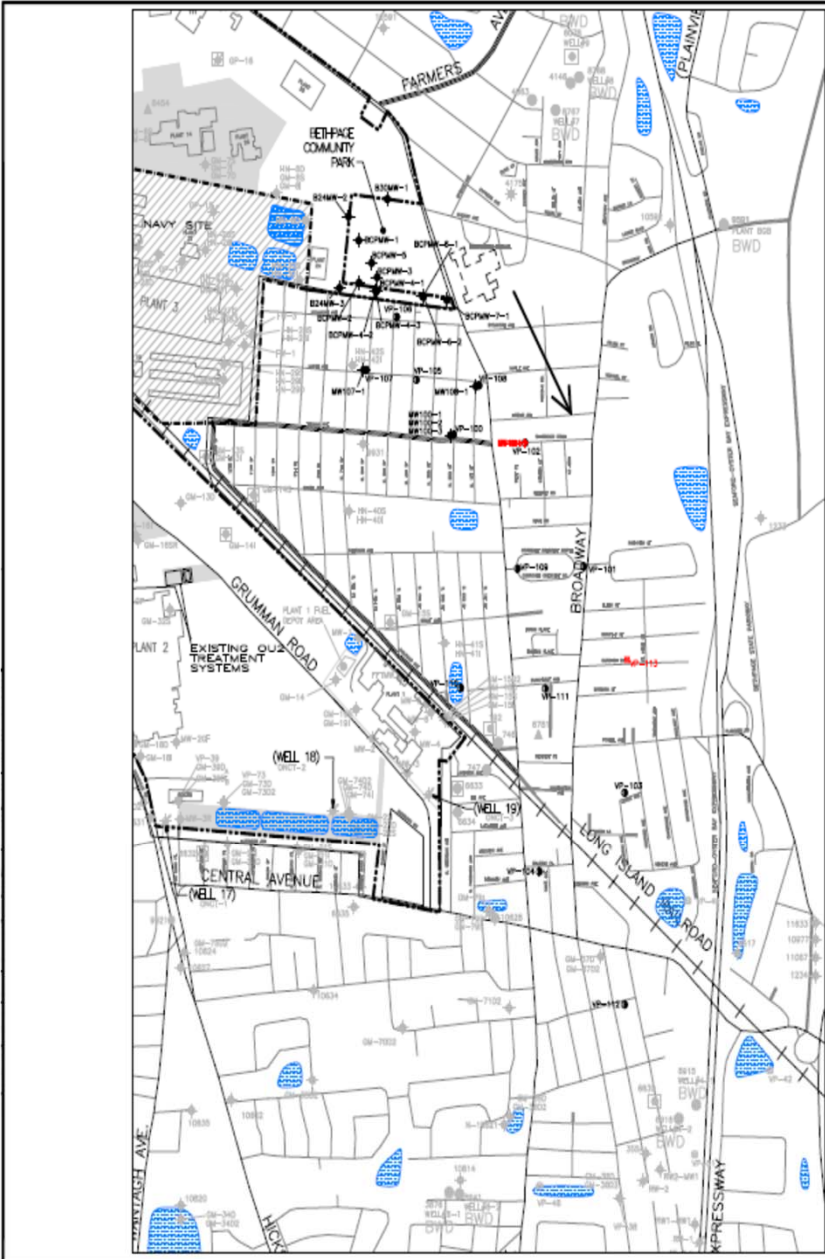


TOWN OF WESTCHESTER
 WESTCHASE COMMUNITY PARK
 WESTCHASE, NEW YORK

**REMEDIAL INVESTIGATION PROGRAM - PHASE 2A
 SOIL BORING AND TEST PIT LOCATIONS**

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FIGURE 8



- LEGEND**
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN RESIDENCE SITE
 - PROPERTY BOUNDARY OF U.S. NAVY SITE
 - ||||| LONG ISLAND RAILROAD
 - IDENTIFIED NORTHROP GRUMMAN OWNED PROPERTY
 - ▨ IDENTIFIED U.S. NAVY OWNED PROPERTY (AS OF 2003)
 - WETHALE PARK
 - LIMITS OF WETHALE HIGH SCHOOL MAIN BUILDING
 - OBSERVATION MONITORING WELL (GRAY - SHOWN FOR REFERENCE) (BLACK - PROPOSED TO BE SAMPLED IN PHASE 2 II)
 - INDUSTRIAL WELL
 - PUBLIC SUPPLY WELL
 - IRRIGATION WELL
 - NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
 - ABANDONED PRODUCTION WELL
 - COMPLETED OLD VERTICAL PROFILE BORING
 - COMPLETED OLD VERTICAL PROFILE BORING
 - PROPOSED OLD VERTICAL PROFILE BORING
 - PROPOSED OLD CONTINGENCY VERTICAL PROFILE BORING
 - COMPLETED MONITORING WELLS
 - PROPOSED MONITORING WELLS
 - BWD BETHPAGE WATER DISTRICT
 - VPD VERTICAL PROFILE BORING
 - RI REGIONAL INFILTRATION
 - OI2 OPERABLE UNIT 2
 - OI3 OPERABLE UNIT 3
 - ← GENERAL APPROX. GROUNDWATER FLOW DIRECTION

GENERAL NOTES

1. THIS PLAN INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION RECEIVED BY ARCADIS IN RESPONSE TO A SEPTEMBER 2001 LETTER TO WATER DISTRICTS.
2. BATHYMETRIC LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (BOSTON/TOWN, HENSHAW, FREDPORT AND ANTIETAN QUADRANGLES) AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
3. NORTHROP GRUMMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN JUNE 2003.
4. LOCATIONS OF MONITORING WELLS INSTALLED BY ODEBA & BATELLECCI (OBS) AT PLANT 1 (O.A. WP-1 TO WP-10) WERE APPROXIMATE BASED ON OUR SITE PLAN, PROVIDED ON DECEMBER 18, 2002.
5. LOCATIONS OF MONITORING WELLS INSTALLED BY ODEBA & BATELLECCI (OBS) AT WETHALE COMMUNITY PARK ARE APPROXIMATE BASED ON DATA PROVIDED BY OUR SITE PLAN, DATED DECEMBER 2003.



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1	08-07	ISSUE PUBLIC WORK	1/18
1	08-08	ISSUE IFC	REVISION

PROJECT TITLE

OPERABLE UNIT 3
NORTHROP GRUMMAN
SYSTEMS CORPORATION
BETHPAGE, NEW YORK

PROJECT TITLE

SITE PLAN
SHOWING OFF-SITE
MONITORING WELLS AND
VERTICAL PROFILE BORINGS



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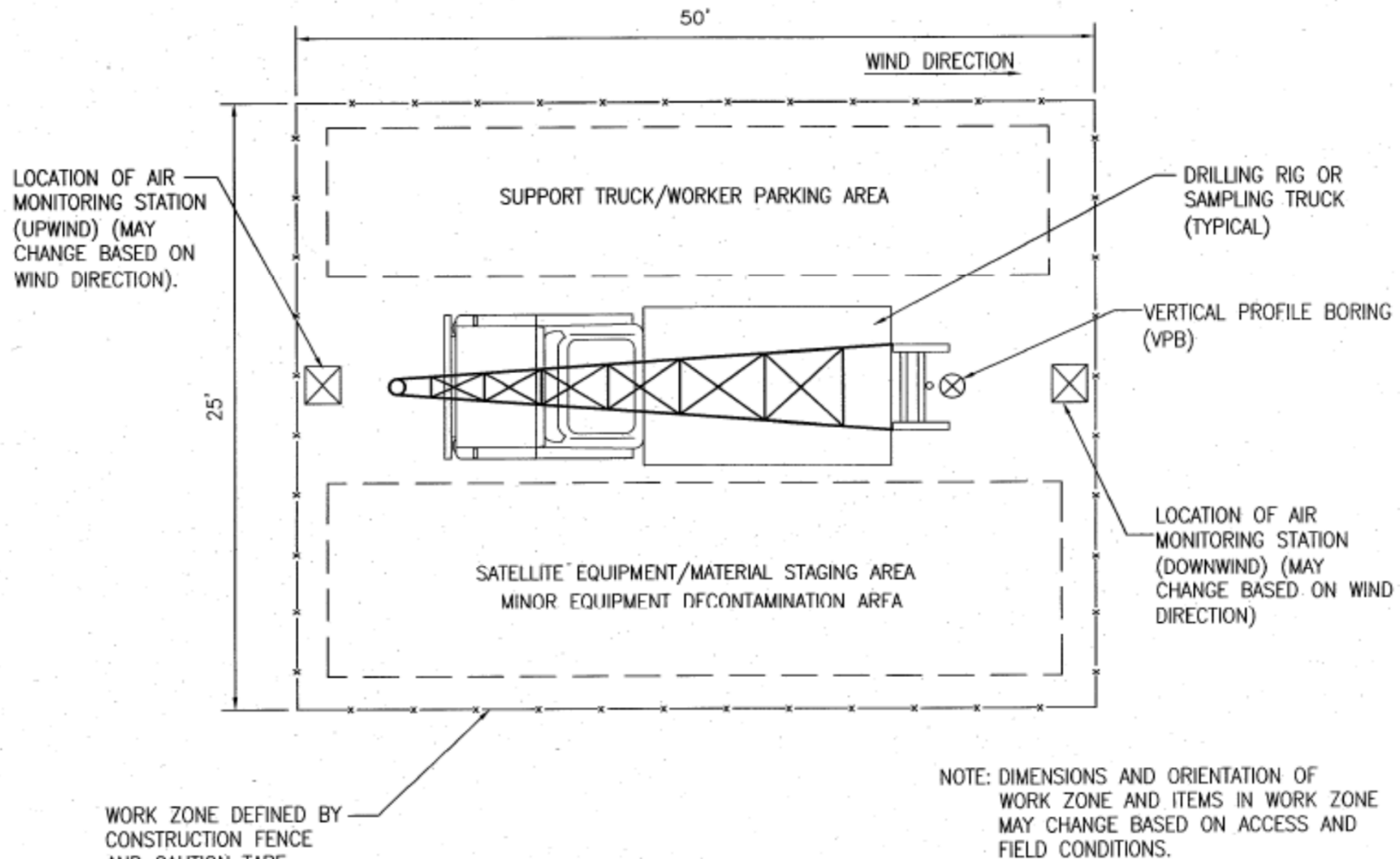
SCALE	SCALE
PROJECT MANAGER C. DAN SHANNON	SENIOR PROJECT MANAGER M. WELCH
DESIGNER DAN WELCH	CHECKED BY M. WELCH
DATE 08/02	DRAWN BY A. SANCHEZ
PROJECT NUMBER NY001464.1007	SCALE 4

ALL OCCURRENCES REFERENCED TO
SHOULD REFERENCE DETAIL 100

Summary of RI (On- and Off-Site)

Type of Work	Media Investigated	Number of Locations	Contaminants Tested
Soil Borings	Soil	354	VOC, SVOC, Metals, PCB
Surface Geophysics	Buried Features	Continuous Grid	NA
Test Pits	Soil	21	VOC, Metals, PCB
Cone Penetrometer/ Membrane Interface Borings	Soil, Perched Water	49	VOC
Piezometers	Perched Water	6	VOC, Metals
Vertical Profile Borings, Shallow	Groundwater, Limited Soil	63	VOC, SVOC, perchlorate
Vertical Profile Borings, Deep	Groundwater	8	VOC, perchlorate
Ambient Air Samples	Ambient Air	4	VOC
Soil Gas Points	Soil Gas	36	VOC
Monitoring Wells	Groundwater	12	TBD

Figure 5. Typical Off-Site RI Operations Footprint



Test Pit Operation



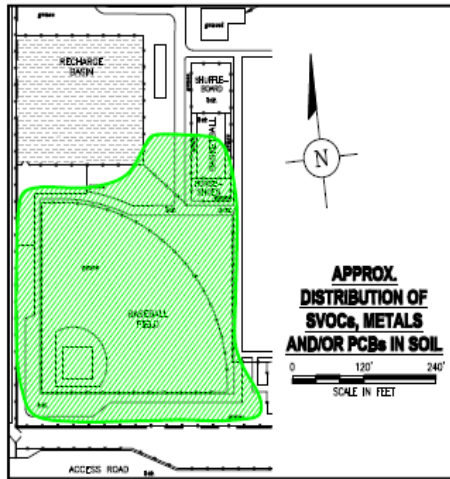
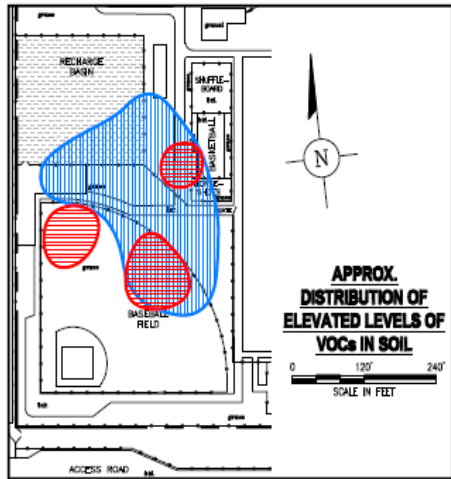
Typical Test Pit in the Ballfield Area



Example of Buried Debris



SOUTHWESTERN PORTION OF BETHPAGE COMMUNITY PARK

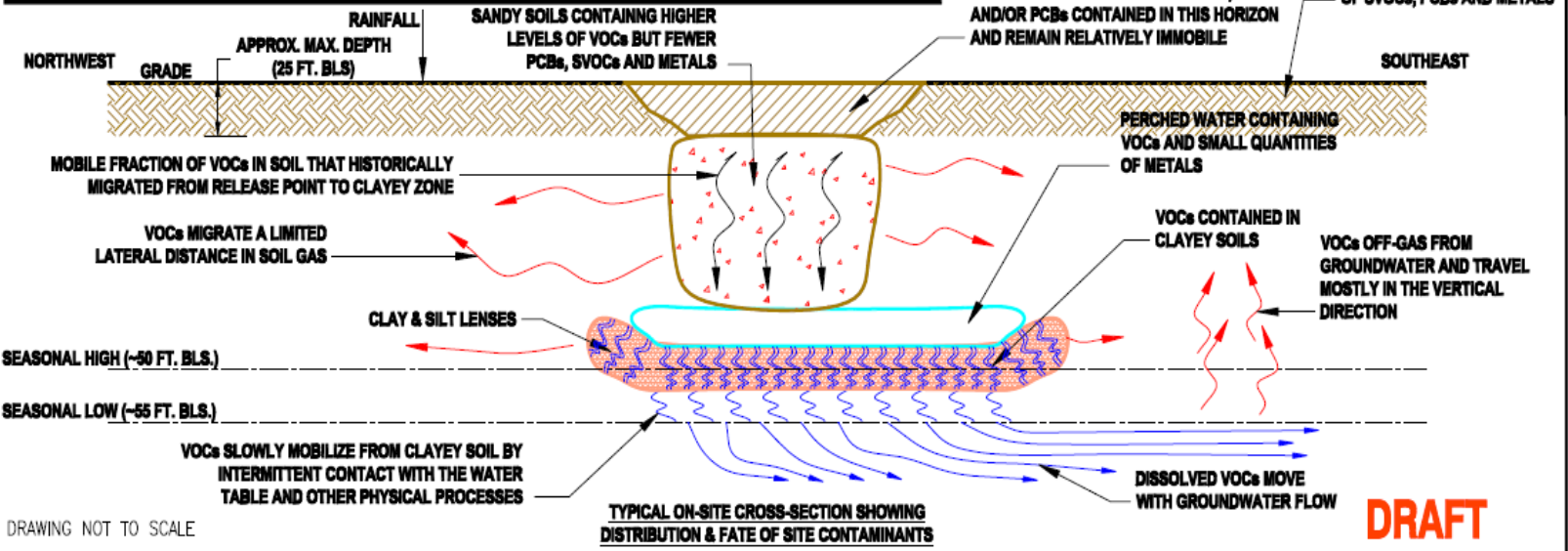


EXPLANATION

- NORTHROP GRUMMAN CORPORATION PROPERTY LINE
- FENCE
- BASIN
- 0.5" BITUMINOUS PAVEMENT
- VOCs NEAR LAND SURFACE (APPROX. 0-25 FT. BLS.)
- ▨ VOCs NEAR WATER TABLE IN CLAYEY ZONES (APPROX. 30-55 FT. BLS.)
- ▨ SVOCs, METALS AND PCBs DETECTED NEAR LAND SURFACE (APPROX. 0-25 FT. BLS.)

NOTES:

- THIS FIGURE IS QUALITATIVE IN NATURE AND IS NOT INTENDED TO CONVEY QUANTITATIVE INTERPRETATION OF SAMPLE RESULTS.
- ALL AREAS OF CONCERN IN PARK NOT SHOWN



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ISSUED DATE	REVISION DESCRIPTION	BY/CHK
6-27-07	NYSDEC PUBLIC MEETING	DES

ARCADIS
OF NEW YORK, INC.

Two Huntington Quadrangle
Suite 1010
Melville, NY 11747
Tel: 631-248-7000 Fax: 631-248-7010
www.arcadis-us.com

PROJECT TITLE
OPERABLE UNIT 3
FORMER GRUMMAN
SETTLING PONDS
BETHPAGE, NEW YORK

PROJECT MANAGER
C. SAN GIOVANNI

DEPARTMENT MANAGER
M. WOLFERT

SHEET TITLE
CONCEPTUAL SITE MODEL

LEAD DESIGN PROF.
M. RENOLD

TASK/PHASE NUMBER
00002

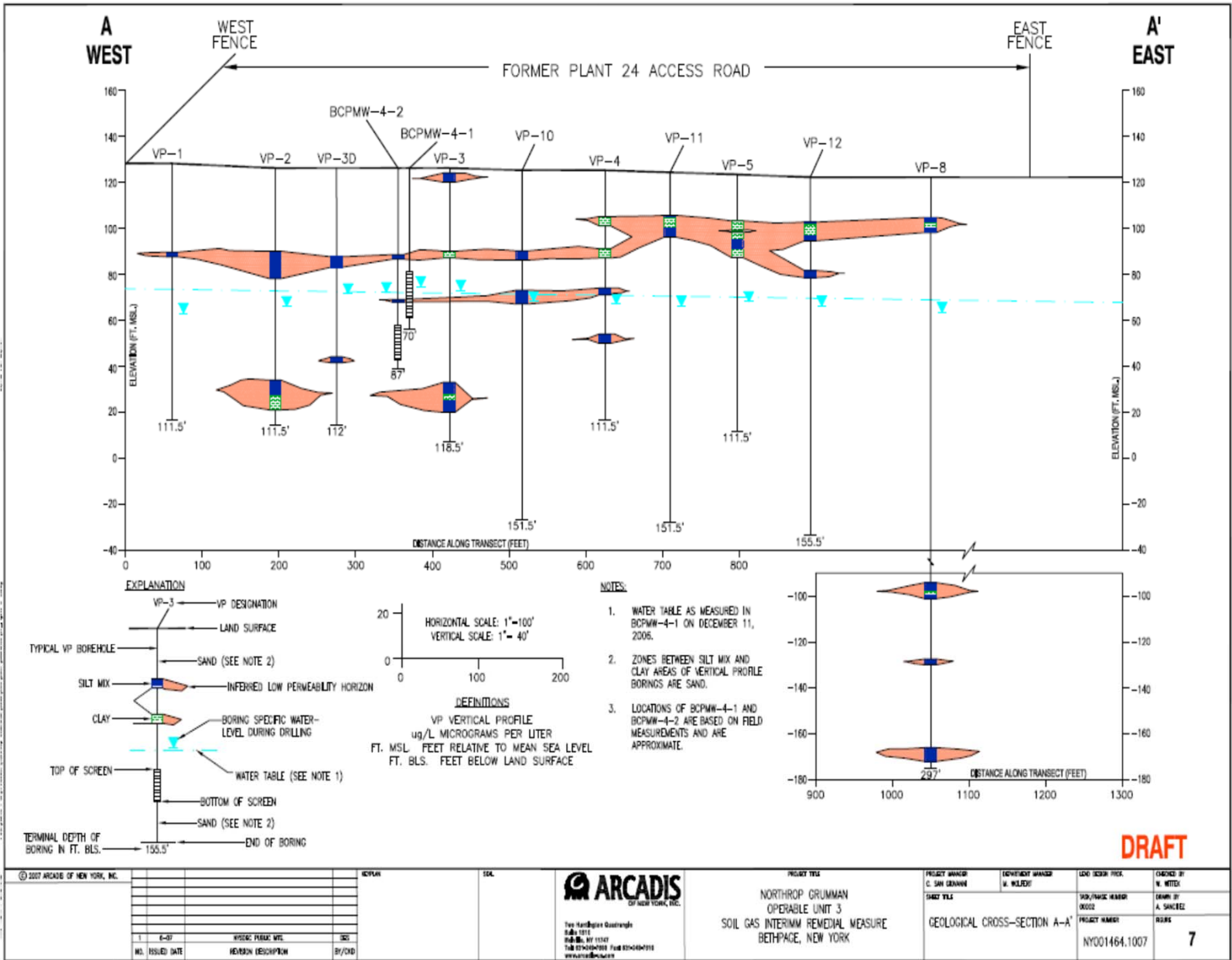
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A. SANCHEZ

FIGURE
6








Soil Gas Interim Remedial Measure

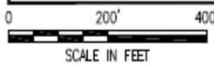
- Objective:
 - Prevent off-site migration of VOCs in soil gas
- System components:
 - Depressurization/Monitoring Wells
 - Below-Grade Piping
 - Equipment Building (Blower/Electrical Systems)
 - Emissions Control (Vapor Treatment)





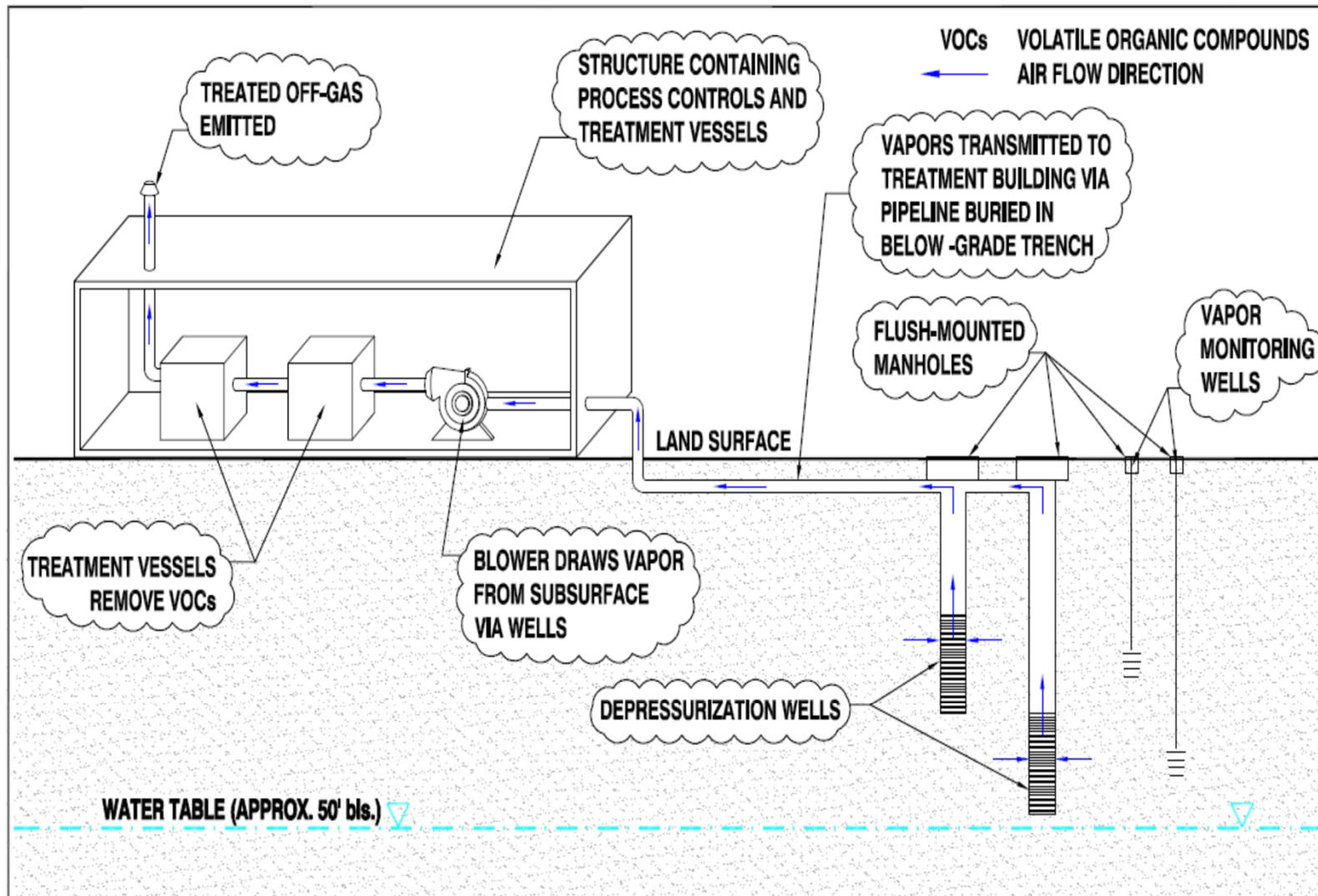
EXPLANATION:

-  NORTHROP GRUMMAN PROPERTY LINE
-  FENCE
-  LIMITS OF BETHPAGE HIGH SCHOOL MAIN BUILDING
-  0 ft. BITUMINOUS PAVEMENT
-  PROPOSED LOCATION OF GROUNDWATER & SOIL GAS INTERIM REMEDIAL MEASURE SYSTEMS
-  SOIL GAS PILOT STUDY LOCATION
-  GROUNDWATER BENCH SCALE/TREATABILITY STUDY SAMPLE COLLECTION LOCATION



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© 2007 ARCADIS OF NEW YORK, INC.		NEW YORK	SOIL	 <p>Two Haverhill Court 9th Floor P.O. Box 11147 Fairport, NY 11731 Tel: 878-240-7000 Fax: 878-240-6111 www.arcadisusa.com</p>	PROJECT TITLE NORTHROP GRUMMAN OPERABLE UNIT 3 INTERIM REMEDIAL MEASURES BETHPAGE, NEW YORK	PROJECT MANAGER C. SAN CRANNE	DEVELOPMENT MANAGER M. WILDEY	LEAD DESIGN FIRM NYP/PAISIE PARTNER 00022 PROJECT NUMBER NY001464.1007	CHECKED BY D. STEIN
NO. ISSUED 1	DATE 6-07	REVISION DESCRIPTION HYDRO PAVEMENT	BY/CHKD [blank]		DRAWN BY A. SHARTEL	DURS 8			



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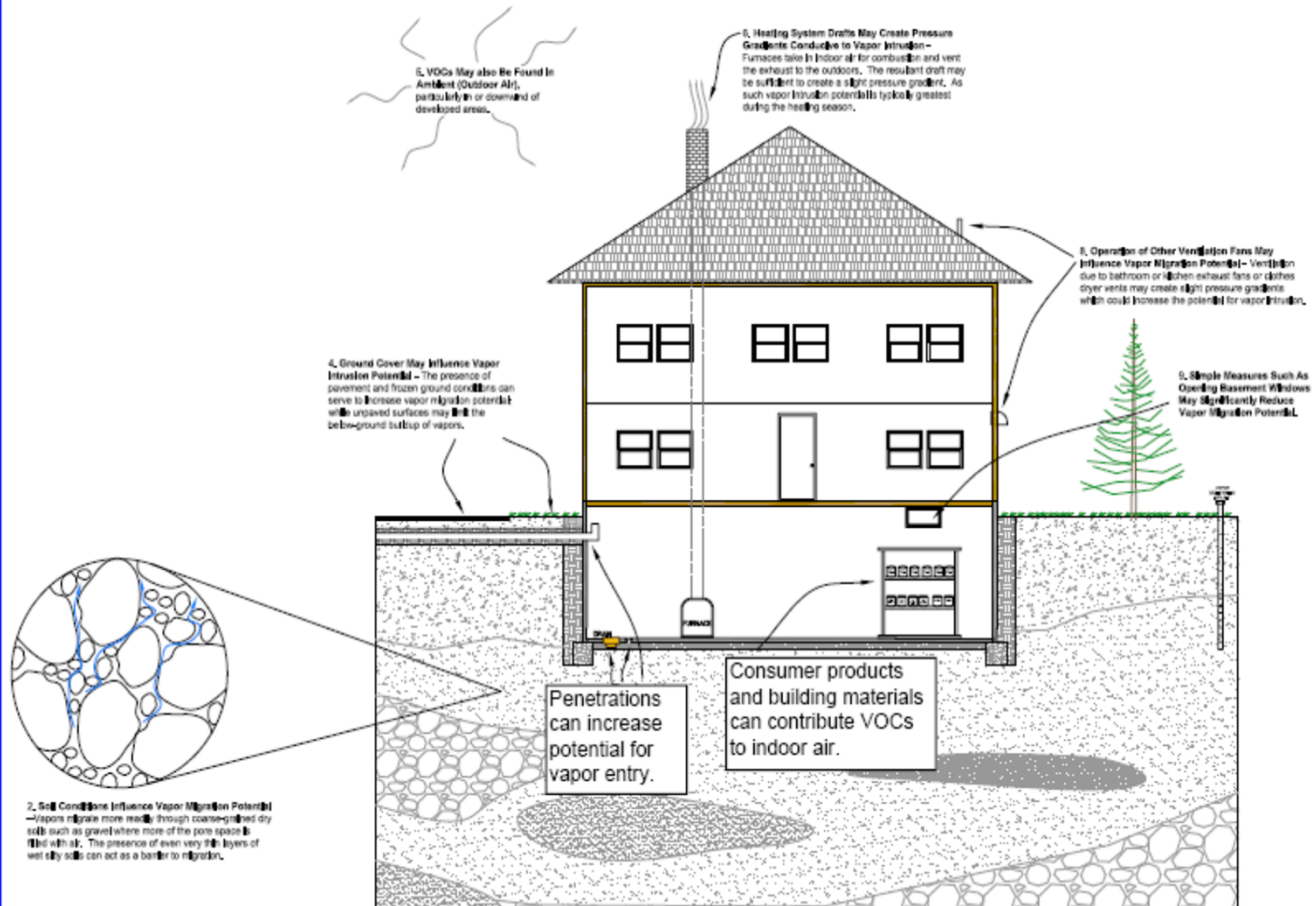
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© 2007 ARCADIS OF NEW YORK, INC.		NEW YORK	SOIL	 Two North River Quadrangle 4th Fl. 1515 15th St., NY 10147 Tel: 212-692-0100 Fax: 212-692-0110 www.arcadisusa.com	PROJECT TITLE	PROJECT MANAGER	DEVELOPMENT MANAGER	LEAD DESIGN PRINC.	CHECKED BY
					NORTHROP GRUMMAN OPERABLE UNIT 3 SOIL GAS INTERIM REMEDIAL MEASURE BETHPAGE, NEW YORK	C. SAN GERMAN	W. WILDEY		D. STEIN
					CHIEF TITLE				DESIGN BY
									A. SAUCEZ
1	6-07	ISSUE PUBLIC VET.	DCI			CONCEPTUAL PROCESS FLOW DIAGRAM			REVISION
NO.	ISSUED DATE	REASON DESCRIPTION	BY/CHKD				PROJECT NUMBER	NY001464.1007	9

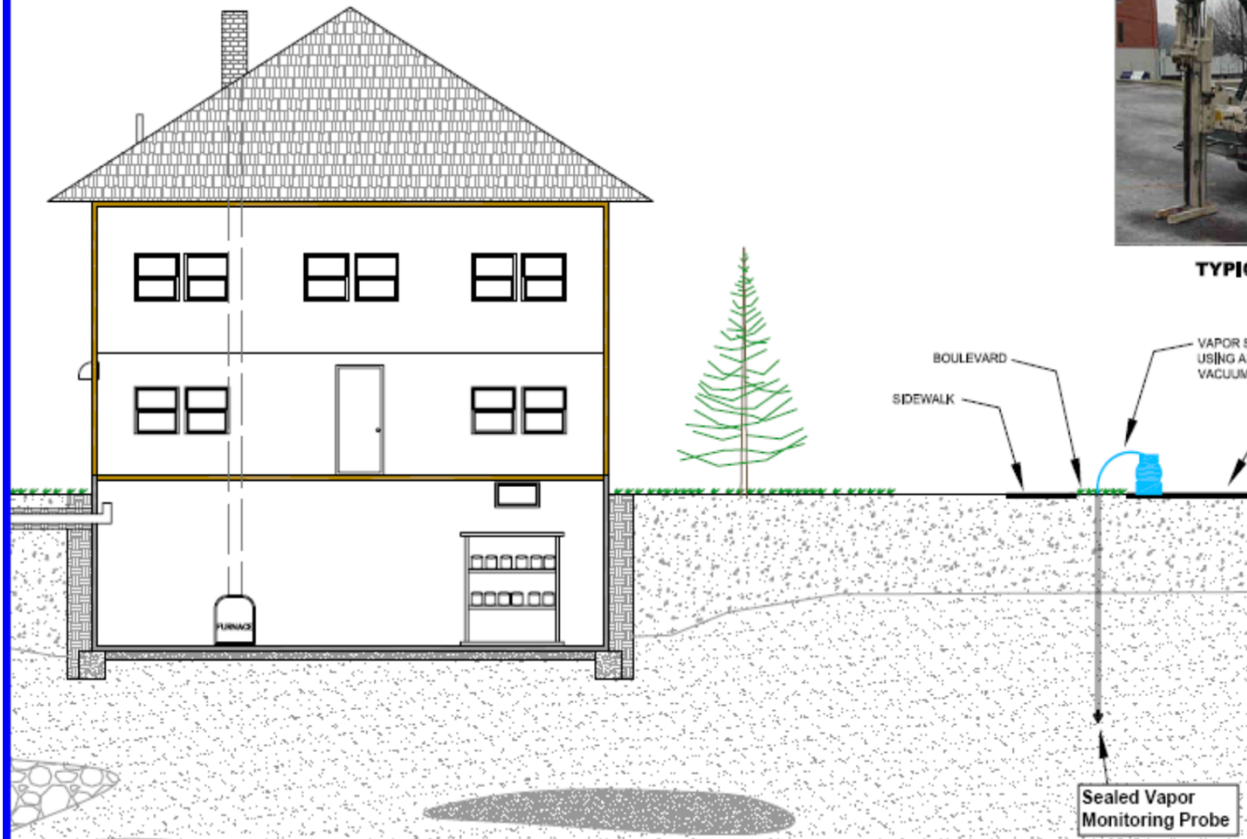
Groundwater Interim Remedial Measure

- Objectives:
 - Minimize off-site migration of VOCs in groundwater
 - Create/enhance VOC-free water-table lens south of Park
- Options Under Consideration:
 - Groundwater Pump & Treat
 - Enhanced Biodegradation
 - Reactive Barrier
 - Chemical Oxidation

VAPOR INTRUSION CONCEPTS

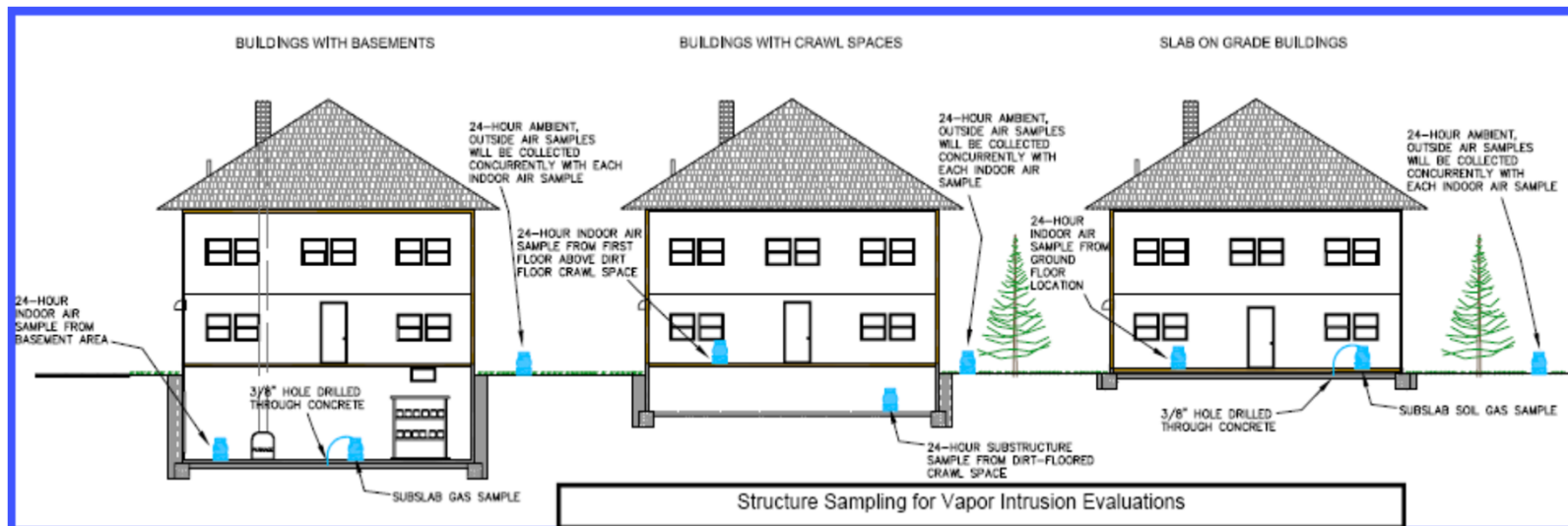


Soil Gas Sampling



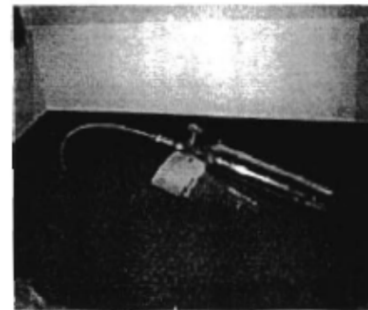
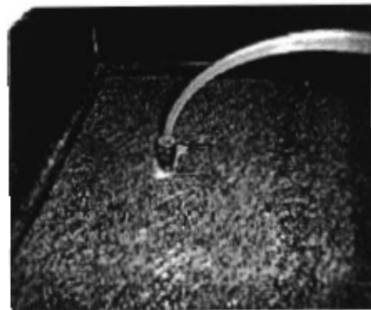
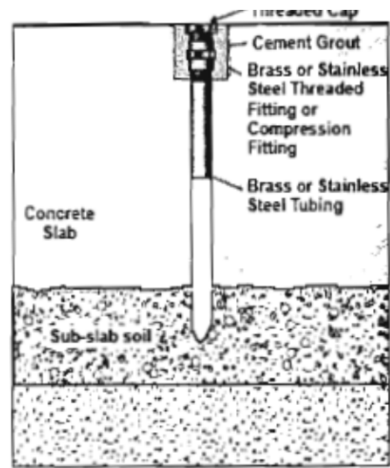
TYPICAL SOIL GAS SAMPLING RIG

- Sampling points are identified and marked in the public right-of-way.
- Truck mounted drill rig is used to drive a 1.5-inch diameter steel rod into soil.
- Air sample is collected at a depth of 6 to 8 feet below ground, similar to building foundation depth.
- Samples are submitted for laboratory analysis.
- Soil Gas Results will be presented



Typical Indoor Air Sampling Interferences





Sub-Slab Sampling

MITIGATION SYSTEM

1. Operation of an engineered subsurface depressurization system combined with sealing probable points of vapor entry from the subsurface (e.g., cracks and joints in concrete, etc.) has been proven effective and will be the means of mitigation.

2. Piping is routed up an exterior wall to above roof level.



3. Blower System - Placed in an exterior location near ground level to allow for easy maintenance. Quiet reliable operation with low power consumption, the equivalent of a 100-watt lightbulb.



4. Operation is verified through a manometer device that registers air flow.



5. Draft from the blower is used to "sweep" gases from the soil, which often creates a negative pressure condition in the subsurface. The gases are then discharged to the atmosphere. Systems of this type are applied most frequently to mitigation of radon intrusion.

ACTION PLAN - GROUNDWATER VAPOR PROJECT-10

ENDICOTT, NEW YORK

Estimated Project Schedule

- On-Site
 - RI Field Work: Completed
 - Soil Gas IRM Startup: October 2007
 - RI Report: Late Summer 2007
 - Feasibility Study: December 2007
 - Groundwater IRM Startup: October 2008
- Off-Site
 - RI Field Work: First Quarter 2008
 - RI Report: June 2008
 - Feasibility Study: September 2008
- Additional Public Meetings: To Be Determined

Contact Information

In case of project questions or concerns, please contact the NYSDEC:

Mr. Steven Scharf, P.E.

Project Manager

NYSDEC

Main Office: (518) 402-9620, Ext 3.

E-mail: sxscharf@gw.dec.state.ny.us

Mr. William Fonda

Ms. Aphrodite Montalvo

Citizen Participation Specialists

NYSDEC Public Affairs & Education

Main Office: (631) 444-0347

E-Mails: bmfonda@gw.dec.state.ny.us

axmontal@gw.dec.state.ny.us

Contact Information

In case of health-related questions or concerns, please contact the NYSDOH:

Ms. Jacquelyn Nealon

New York State Department of Health

Main Office: (518) 402-7870

E-mail: Jen02@health.state.ny.us

Contact Information

If you wish to contact Northrop Grumman directly, please contact:

Mr. John A. Vosilla

Manager, Communications – Eastern Region

Northrop Grumman Integrated Systems Corporation

600 Grumman Road West, Bethpage, NY 11714-3582

Main Office Telephone: (516) 575-5119

Cellular Phone: (516) 816-5354 (24 hours/day)

E-mail: john.vosilla@ngc.com

Please pick up a Fact Sheet on your way out!