NWIRP Bethpage Review Meeting
GM-38 Groundwater Treatment System Overview
NWIRP Bethpage Facility, New York
Large Conference Room
Thursday, October 11, 2007
1300 to 1600

Agenda

1. Introductions - Susan Clarke (appx 10 min)

2. GM-38 Presentation - Stavros Patselas (appx 30 min)

3. Questions and Answers - Susan Clarke/Stavros Patselas (appx 30 min)

4. Site Visit (appx 60 min)

Attendees:
CDR Andrew Holland, NE IPT Commander
CDR Todd Henricks, PWO, New London
Robert Zambarano, Midlant, New London
Christopher Shukis, Midlant, New London
Greg Pierman, Midlant, Long Island
Susan Clarke, Midlant RPM
Al Taormina, NWIRP Bethpage Caretaker (ECOR)
Bob Ingram, Caretaker Support (ECOR)
Stavros Patselas, Project Manager (TetraTechEC)
Brian Blanchard, TetraTechEC
STEVE SCHARF, NYSDEC

SIGN-IN

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Robert Zambarano, Midlant, New London - RAZ
Christopher Shukis, Midlant, New London - Chris S.
Greg Pierman, Midlant, Long Island, ENGR TECH (NTR)
Susan Clarke, Midlant RPM SWC
Al Taormina, NWIRP Bethpage Caretaker (ECOR)
Bob Ingram, Caretaker Support (ECOR) RWI.
Stavros Patselas, Project Manager (TetraTechEC)
Brian Blanchard, TetraTechEC - BKB
STEVE SCHARF, NYSDEC -

NAVFAC
Naval Facilities Engineering Command

Groundwater Remediation Project

Naval Weapons Industrial Reserve Plant
Bethpage, NY
GM-38 Area

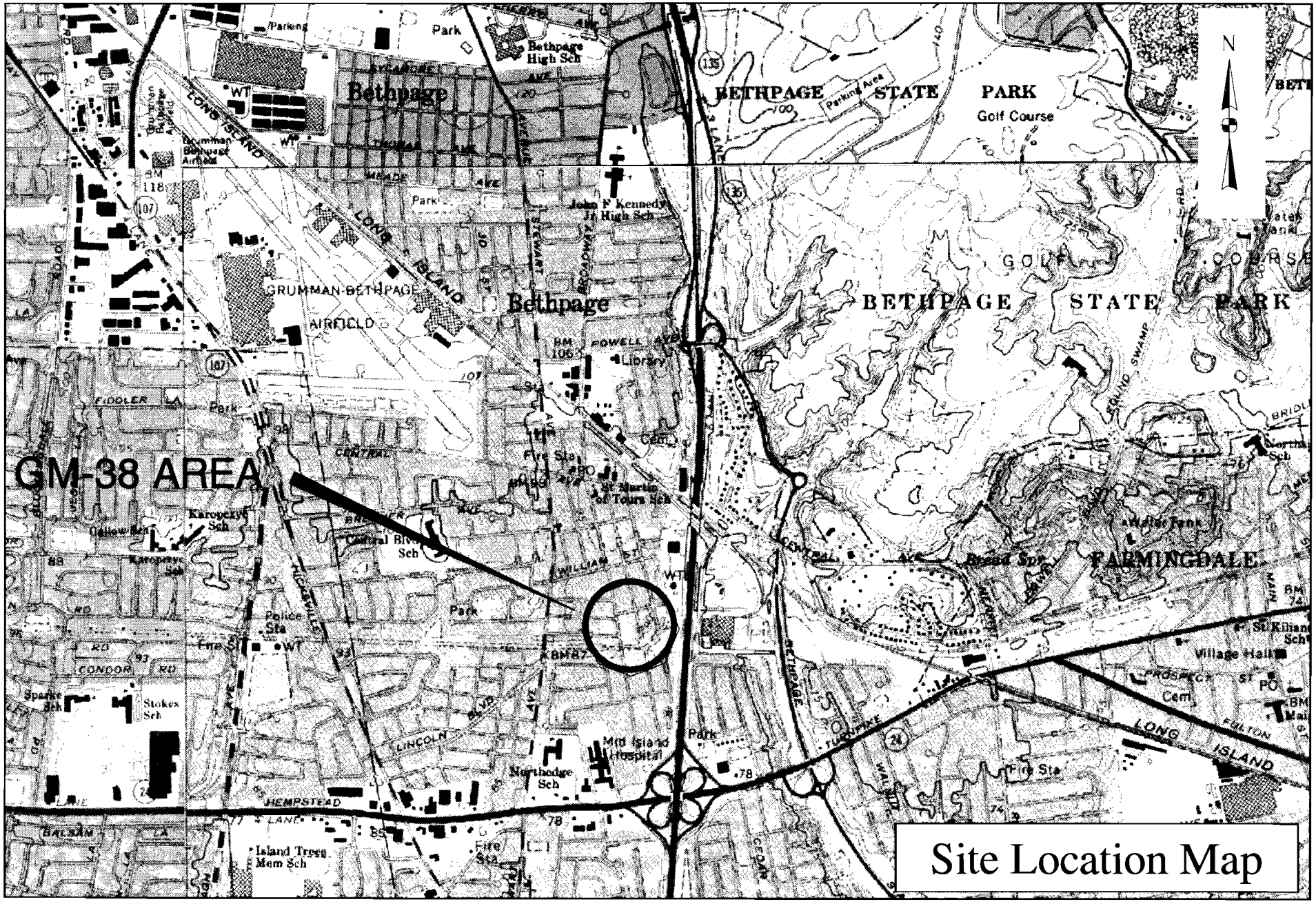
Project Overview Meeting

October 11, 2007

SYSTEM CERTIFICATION ISO 14001 SGS

TETRA TECH EC, INC.

Zip
Do it ... Do it



Site Location Map

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Groundwater Remediation Project

- Project History
- Treatment System Design
- Well Installations
- Construction
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Project History

- Chlorinated solvents detected in GW
- GW pump & treat system installed on Northrop Grumman property (Nov 1998)
- GM-38 Area delineated (June 2000-April 2002)
- Conceptual Plans to design and build GWTP in GM-38 Area for mass removal (February 2003)

Project History (cont'd)

- Community Workshop (September 2004)
- Pre-design investigation (Nov 04 – May 05)
- Draft Remedial Design (February 2005)
  – Reviewed by Navy and Third Party Consultant
- Sampled the GM-38 Area wells (July 2005)
- 90% Draft Final Design (November 2005)

  - Reviewed by same plus NYS DEC, TOB, Nassau County, public, and Navy ROICC

Project History (cont'd)

- Received all public review comments (mid - January 2006)
- Response to comments letter (March 2006)
- NYS DEC requests to finalize design (April 10, 2006)
- Final Design (May 8, 2006)
- RAB Meeting presents final design (June 7, 2006)
- Construction phase planning (November 2005 – ongoing)
- Property access agreements near completion

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
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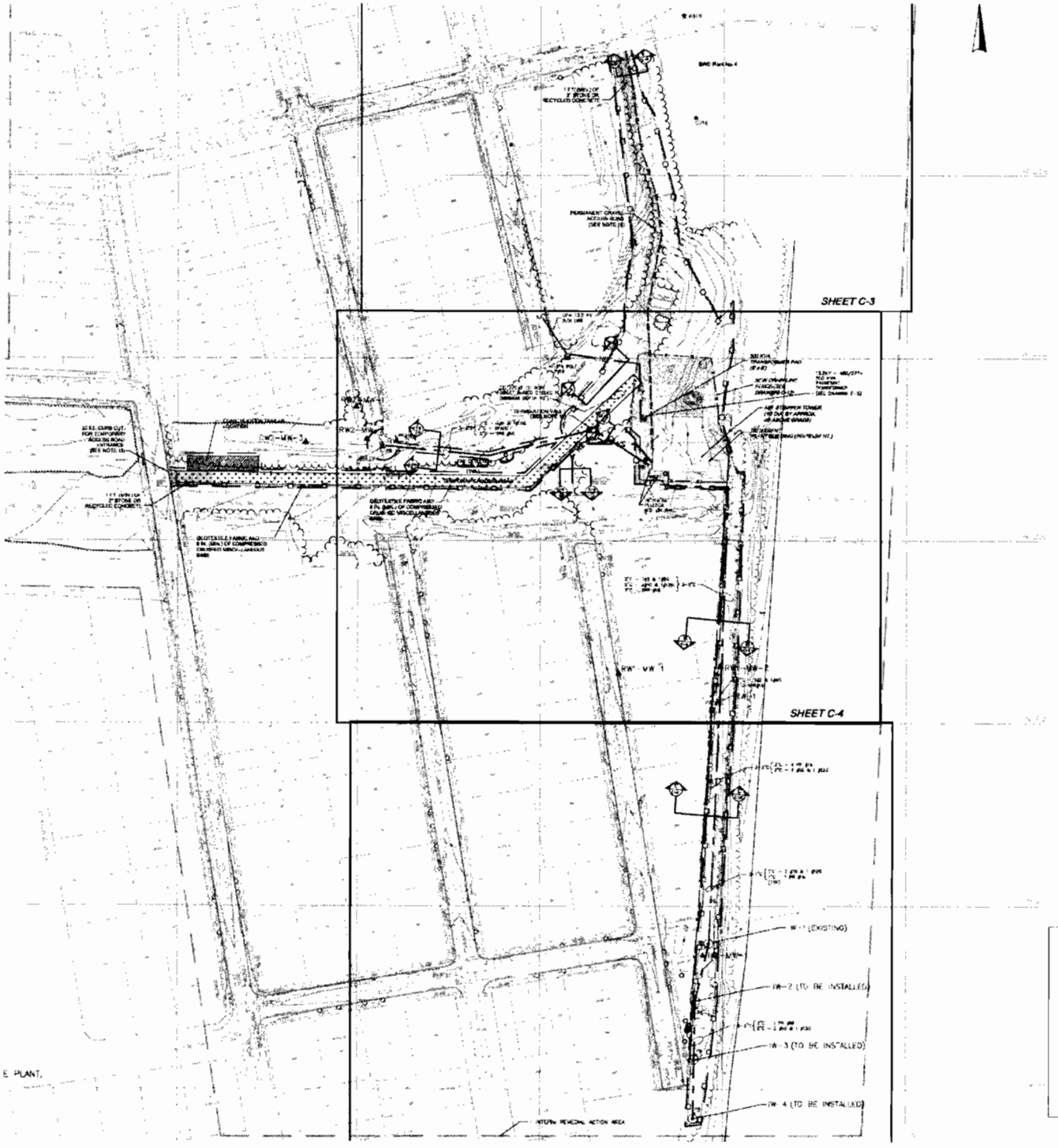
Treatment System Design

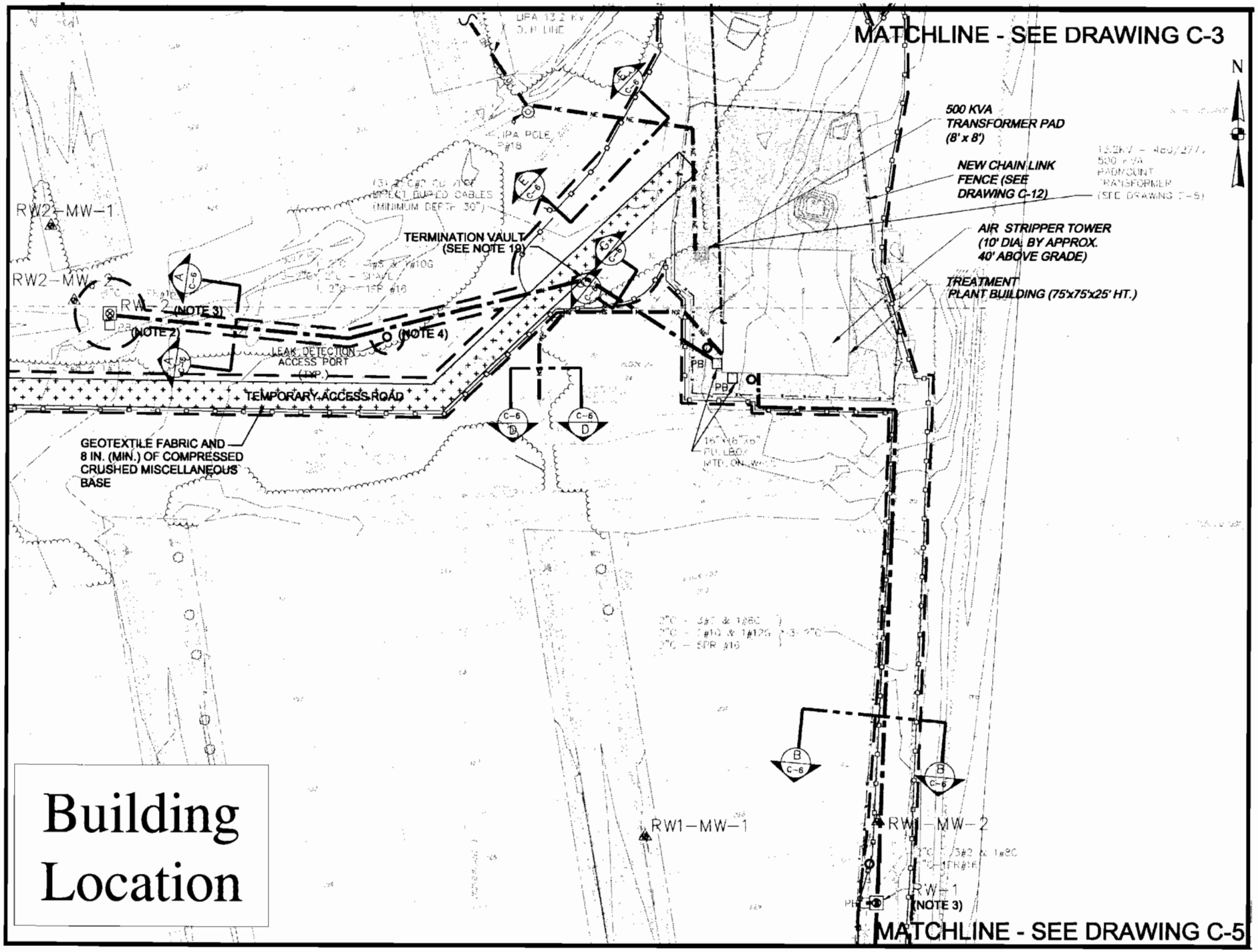
- Mass Removal of Volatile Organic Compounds (VOC's) from groundwater
- Process Flow Rate = 1,100 gallons per minute (gpm)
- Max. Design Flow Rate = 1,375 gpm
- Pumping from two or three recovery wells

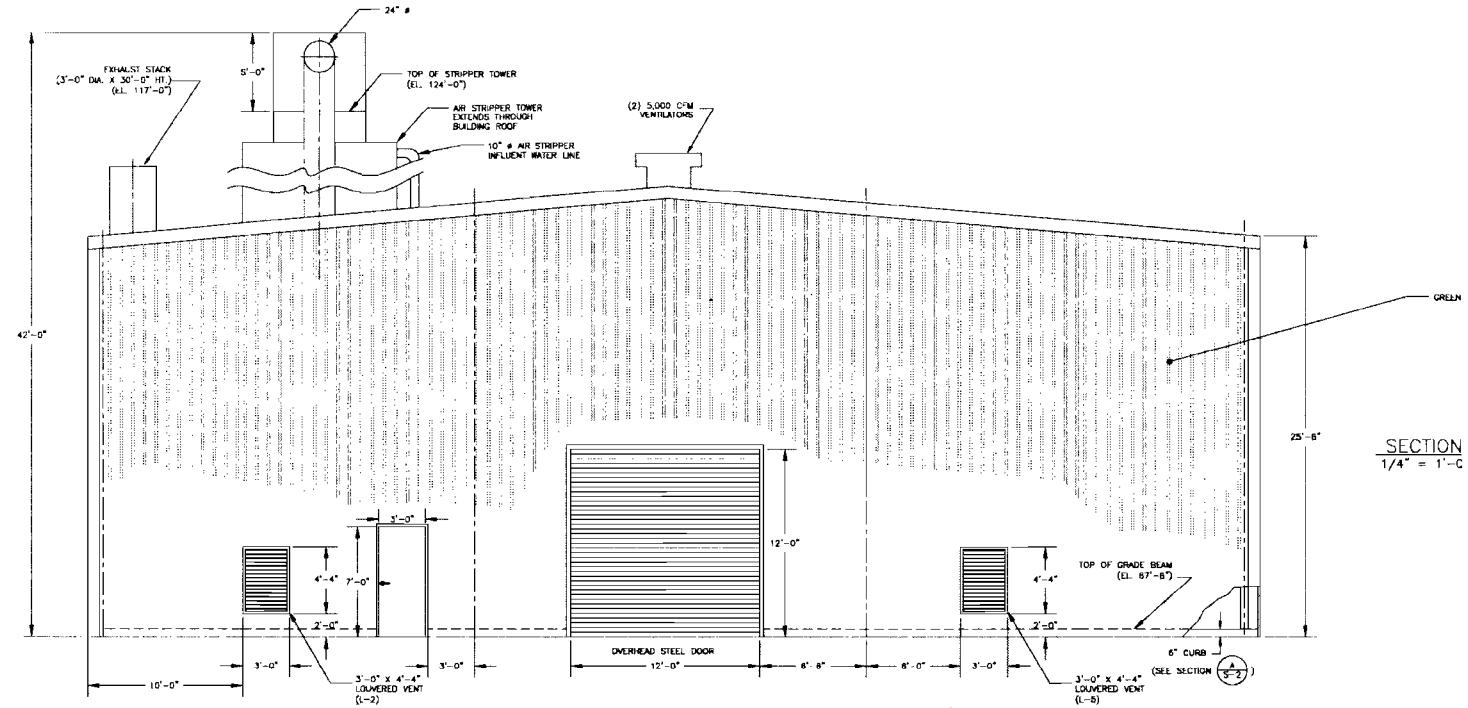
Treatment System Design (cont'd)

- Primary treatment is Air Stripping
- Secondary treatment (polish) is Carbon Media
- Vapors from Air Stripping Treated w/ Carbon Media
- Inject treated water into four injection wells

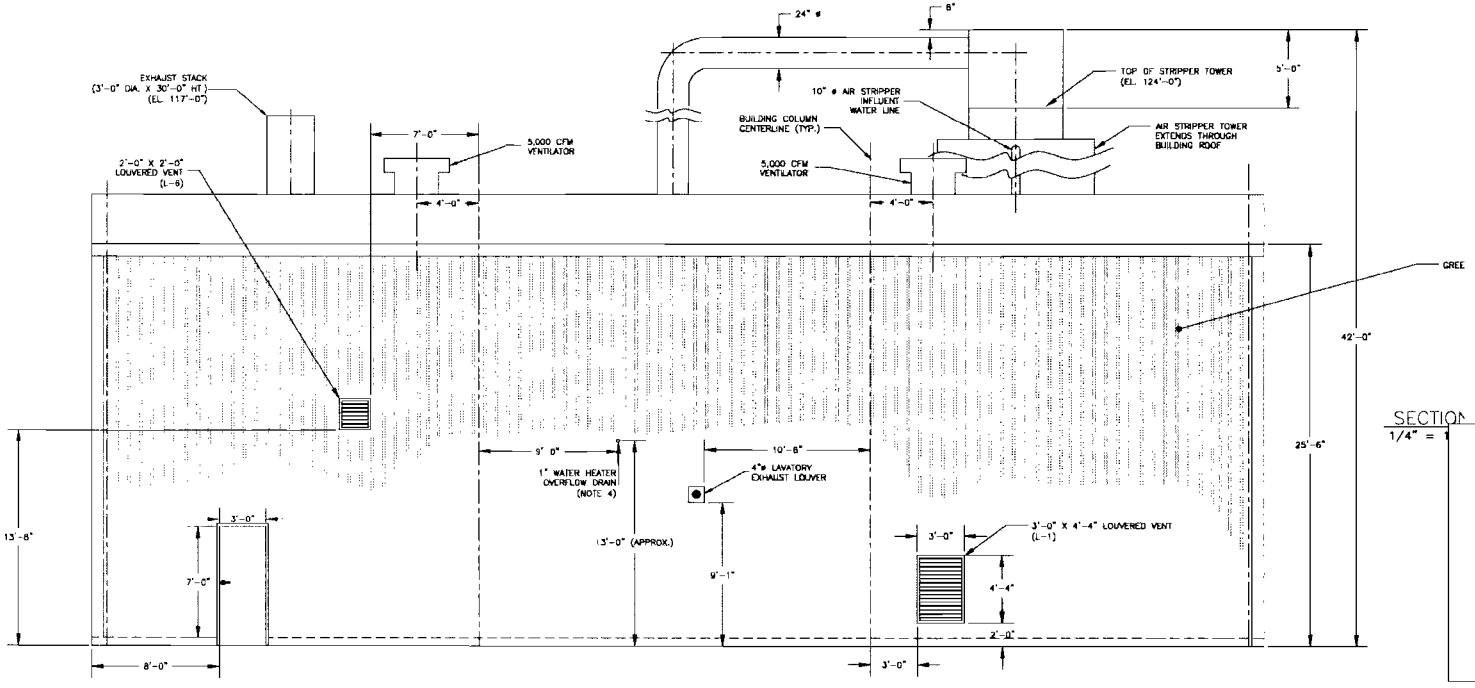

SHEET C-3
SHEET C-4
MW-1 (EXISTING)
RW-2 (TO BE INSTALLED)
RW-3 (TO BE INSTALLED)
RW-4 (TO BE INSTALLED)

Site Plan


MATCHLINE - SEE DRAWING C-3
N
500 KVA
TRANSFORMER PAD
(8' x 8')
NEW CHAIN LINK
FENCE (SEE
DRAWING C-12)
AIR STRIPPER TOWER
(10' DIA. BY APPROX.
40' ABOVE GRADE)
TREATMENT
PLANT BUILDING (75'x75'x25' HT.)
TERMINATION VAULT
(SEE NOTE 10)
RW2-MW-1
RW2-MW-2
RW-2
(NOTE 3)
(NOTE 2)
(NOTE 4)
LEAK DETECTION
ACCESS PORT
(TYP.)
TEMPORARY ACCESS ROAD
GEOTEXTILE FABRIC AND
8 IN. (MIN.) OF COMPRESSED
CRUSHED MISCELLANEOUS
BASE
RW1-MW-1
RW1-MW-2
RW-1
(NOTE 3)
MATCHLINE - SEE DRAWING C-5
Building
Location

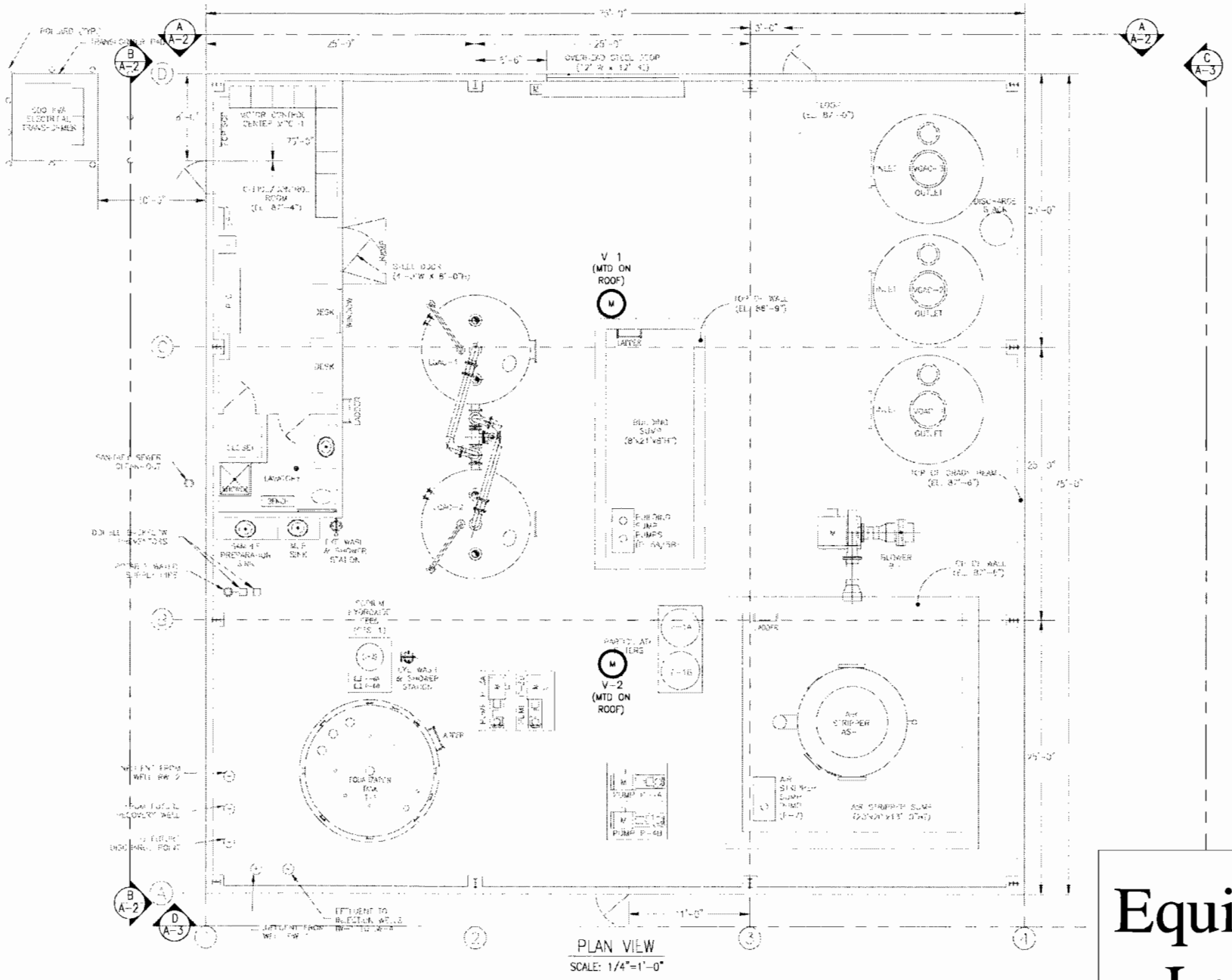


SECTION
1/4" = 1'-0



SECTION
1/4" = 1

Building Views



Equipment Layout

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Well Installations

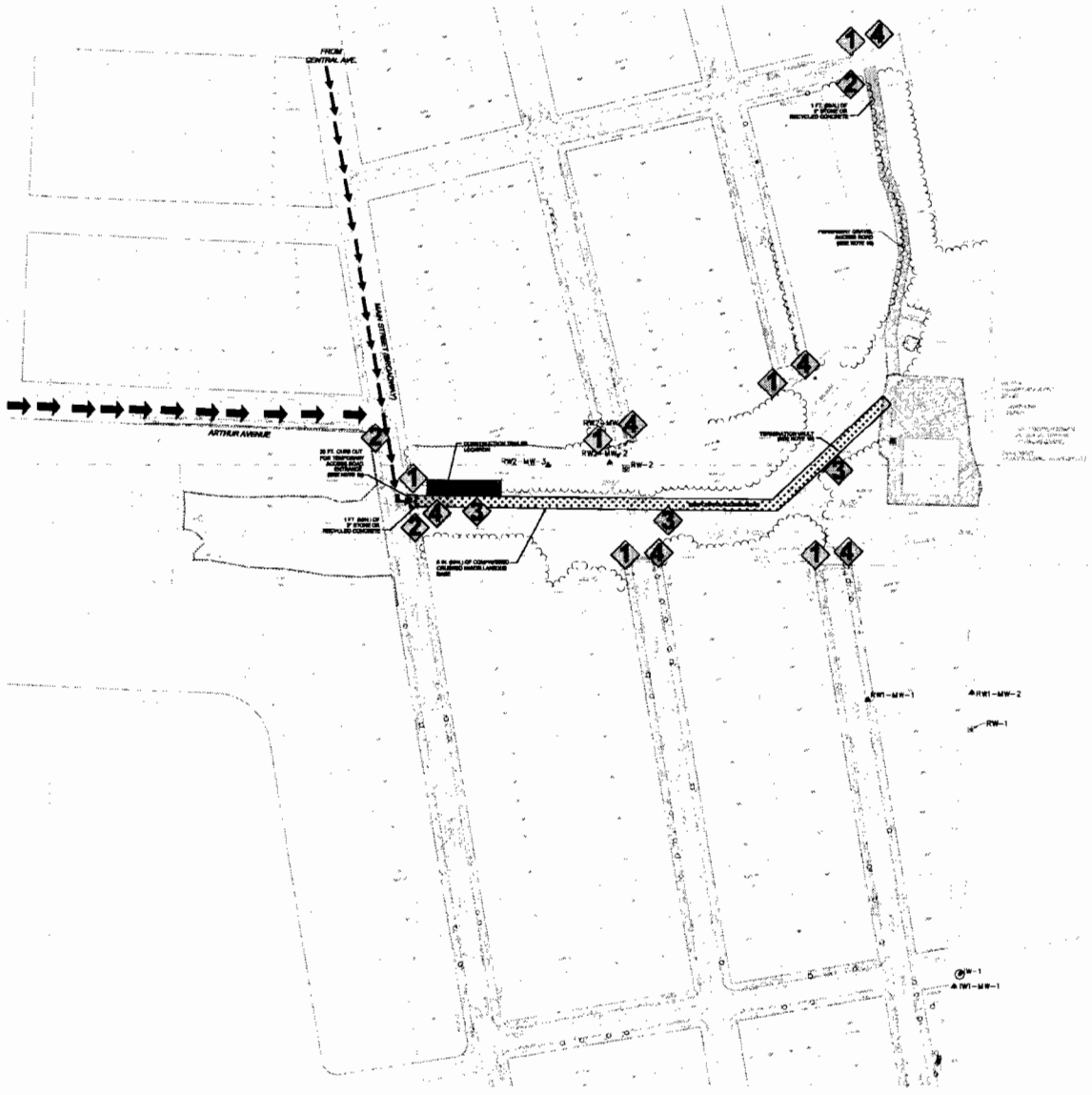
- Currently installed (Nov 2004 - May 2005)
  - 2 Recovery Wells
  - 1 Injection Well
  - 6 Monitoring Wells
- To be installed during construction
  - 3 Injection Wells
  - 1 Recovery Well
  - 8 Monitoring Wells

Groundwater Remediation Project

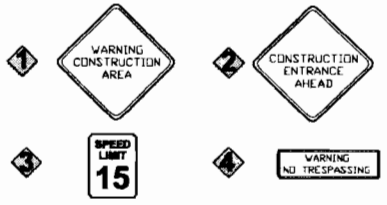
- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Construction

- Project Signage and Traffic Controls
- Erosion and Sediment Controls
- Access Roads (permanent and temporary)
- Install Building Footers and Foundation
- Trenching to Recovery and Injection Wells
- Utility Tie-in Connections (electric, phone, water, and sanitary sewer)
- Building Floor



5. STORM SEWER DRAINAGE MANHOLE LOCATIONS, CATCH BASIN LOCATIONS AND RIM ELEVATIONS ARE AS PER L.K. McLEAN ASSOCIATES FIELD DATA EXCEPT WHERE OTHERWISE NOTED.
6. THE LOCATION OF THE DRAINAGE (STORM SEWER) PIPES ON SOPHIA STREET HAVE NOT BEEN ESTABLISHED. THERE IS NO DATA ON RECORD AT THE TOWN OF OYSTER BAY DEPARTMENT OF PUBLIC WORKS.
7. MEASUREMENTS ARE IN ACCORDANCE WITH U.S. STANDARDS
8. COORDINATES AND BEARINGS SHOWN ARE IN LONG ISLAND ZONE OF THE NEW YORK STATE PLANE COORDINATE SYSTEM NAD 1983. ELEVATIONS REFER TO NAVD 1929.
9. UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF NEW YORK STATE EDUCATION LAW.
10. CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
11. RIGHTS-OF-WAY NOT SHOWN ARE NOT CERTIFIED.
12. LINES IDENTIFIED ON THIS DRAWING AS PART OF SWPP PROJECT ILLUSTRATE APPROXIMATE AND DO NOT REPRESENT ACTUAL PIPE/WIRE SIZES OR TRENCH WIDTHS
13. TEMPORARY ACCESS ROAD ENTRANCE FROM BROADWAY AVE. SHALL INCLUDE 20 FT. CURB CUT FOR INSTALLATION OF CONCRETE DRIVEWAY APRON.



- PRIMARY ROUTE
- SECONDARY ROUTE

LEGEND:

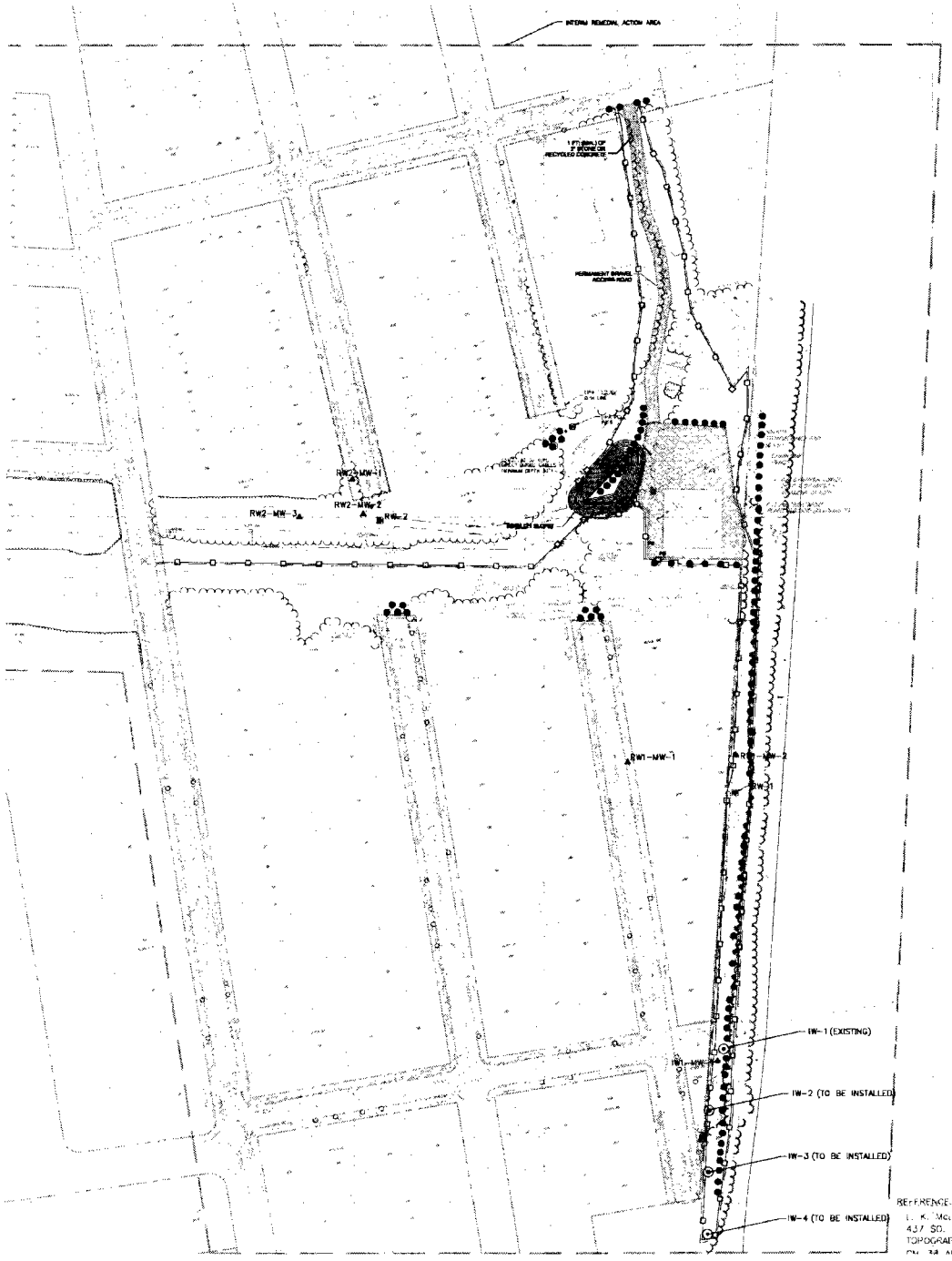
- EXISTING GRADE MAJOR CONTOUR
- EXISTING GRADE MINOR CONTOUR
- PROPOSED GRADE
- TAX LOT LINE
- OVERHEAD ELECTRIC WIRES
- UNDERGROUND ELECTRIC WIRES
- WATER MAIN
- GAS MAIN
- DRAINAGE LINES (STORM SEWER)
- SANITARY SEWER MAIN
- WOODED AREA
- CHAIN-LINK OR BOARD FENCE
- DIRT TRAIL
- LIMITS OF CLEARING
- S.T. FENCE
- NEW UNDERGROUND ELECTRIC WIRES
- NEW WATER LINE
- NEW SANITARY SEWER MAIN
- PIPE PIPE AND ELECTRICAL CONDUIT
- TAX LOT NUMBER
- WATER VALVE
- GAS VALVE
- MONITORING WELL
- RECOVERY WELL
- INJECTION WELL
- PULL BOX
- LEAK DETECTION ACCESS PORT
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- WHERE LOCA
- SIGN
- PUBLIC SUPPL
- MANHOL
- DRAINA
- EMERG ACCES

THIS DRAWING PRODUCED ON

Traffic Control Plan

Construction (cont'd)

- Set Large Equipment with Crane
- Erect Building Structure
- Interior Piping and Electric
- Install Fire Alarm and Security Systems
- Install and Test Instrumentation
- Test and Balance All Systems
- Site Restoration



B. SOIL AMENDMENTS

1) LIME TO pH OF 6.0.
2) FERTILIZE WITH 600 LBS OF 5-10-10 OR EQUIVALENT PER ACRE (14 LBS/1000 SQ. FT.)

C. SEED MIXTURES

1) TEMPORARY SEEDINGS

A. RYEGRASS (ANNUAL OR PERENNIAL) @ 50 LBS. PER ACRE (0.7 LBS./1000 SQ. FT.)
B. CERTIFIED 'ARDOSTOCK' WINTER RYE (CEREAL RYE) @ 100 LBS. PER ACRE (2.5 LBS./1000 SQ. FT.)

USE WINTER RYE IF SEEDING IN OCTOBER/NOVEMBER.

2) PERMANENT SEEDINGS

A. ROUGH OR OCCASIONALLY MOWED AREAS

	LBS/ACRE	LBS/1000 SQ. FT.
EMPIRE BIRDSFOOT TREFOIL[1] OR	8	0.20
COMMON WHITE CLOVER	8	0.20
PLUS		
TALL FESCUE	20	0.45
PLUS		
RED TOP OR	2	0.05
RYEGRASS (PERENNIAL)	5	0.10

[1] ADD INOCULANT IMMEDIATELY PRIOR TO SEEDING.

B. FREQUENTLY MOWED AREAS: REFER TO STANDARD AND SPECIFICATION FOR RECREATION AREA IMPROVEMENT ON PAGE 3.5 OF THE NEW YORK GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL DATED APRIL 1997.

D. TIME OF SEEDING

THE OPTIMUM TIME FOR PERMANENT SEEDINGS WITH LEGUMES (BIRDSFOOT TREFOIL OR CLOVER) IS EARLY SPRING.

PERMANENT SEEDINGS MAY BE MADE ANY TIME OF YEAR IF PROPERLY MULCHED AND ADEQUATE MOISTURE IS PROVIDED. MID SUMMER IS NOT A GOOD TIME TO SEED, BUT THESE SEEDINGS, IF CONSTRUCTION IS COMPLETE, WILL FACILITATE COVERING THE LAND. PORTIONS MAY AND MAY NEED RESEEDING THE FOLLOWING YEAR.

TEMPORARY SEEDINGS SHOULD BE MADE WITHIN 24 HOURS OF CONSTRUCTION OF DISTURBANCE. IF NOT, THE SOIL MUST BE SCARIFIED PRIOR SEEDING.

E. METHOD OF SEEDING

BROADCASTING, DRILLING WITH CULIPACK TYPE SEEDER OR HYDROSEEDING ARE ACCEPTABLE. GOOD SOIL TO SEED CONTACT IS THE KEY TO SUCCESSFUL SEEDINGS.

F. MULCHING AND MULCH ANCHORING

MULCHING IS ESSENTIAL TO OBTAIN A UNIFORM STAND OF PLANTS. SEE STANDARD AND SPECIFICATIONS FOR MULCHING ON PAGE 3.31 OF THE NEW YORK GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL DATED APRIL 1997.

G. IRRIGATION

WATERING MAY BE ESSENTIAL TO ESTABLISH A NEW SEEDING. WEATHER CONDITIONS AND THE INTENDED USE OF THE AREA MAY DICTATE WHEN WATER IRRIGATION IS A SPECIALIZED PRACTICE AND CARE NEEDS TO BE TAKEN NOT TO EXCEED THE APPLICATION RATE/INFILTRATION RATE OF GIVEN SOIL.

NOTE:

1. A MAXIMUM OF 100 PINUS STROBUS (WHITE PINE) SHALL BE PLANTED AT THE APPROXIMATE LOCATIONS SHOWN ON THIS CONTRACT DRAWING. THESE EASTERN WHITE PINE TREES ARE SELECTED DUE TO THEIR RAPID GROWTH AND ABILITY TO PROVIDE A VISUAL AND NOISE BARRIER WHEN FULLY GROWN. THE TREES WILL BE 10'-12' IN HEIGHT WITH 3" MINIMUM AVERAGE DIAMETER AND SPACED APPROXIMATELY 10 FEET ON CENTER. THE WHITE PINE TREES PARALLELING THE SEAFORD OYSTER BAY EXPRESSWAY WILL BE SPREAD AROUND EXISTING TREES AND PREVIOUSLY PLANTED WHITE PINE TREES. PEAT MOSS AND FERTILIZERS CONSISTING OF NITRATE OF SODA AND HOLLY TONE ACID WILL BE USED DURING PLANTING.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE PLANTINGS FOR A PERIOD OF AT LEAST ONE YEAR AFTER THE INSTALLATION AND MUST REPLACE ANY DEAD OR DAMAGED PLANTINGS IN A TIMELY FASHION. AFTER THIS MAINTENANCE PERIOD, THE NAVY SHOULD ASSUME THIS RESPONSIBILITY UNTIL THE SYSTEM IS DECOMMISSIONED.

LEGEND:

	EXISTING GRADE: MAJOR CONTOUR
	EXISTING GRADE: MINOR CONTOUR
	PROPOSED GRADE
	TAX LOT LINE
OHW	OVERHEAD ELECTRIC WIRES
UW	UNDERGROUND ELECTRIC WIRES
W	WATER MAIN
G	GAS MAIN
D	DRAINAGE LINES (STORM SEWER)
S	SANITARY SEWER MAIN
	WOODED AREA
x x x	CHAIN LINK OR BOARD FENCE
	DIRT TRAIL
	LIMITS OF CLEARING
SF SF SF	SILT FENCE
NE NE NE	NEW UNDERGROUND ELECTRIC WIRES
NW NW NW	NEW WATER LINE
NS NS NS	NEW SANITARY SEWER MAIN
	HDPE PIPE AND ELECTRICAL CONDUIT
18	TAX LOT NUMBER
	WATER VALVE
	GAS VALVE
RW1-MW-1	MONITORING WELL
RW-1	RECOVERY WELL

TEMPORARY ACCESS ROAD

Site Vegetation Plan

Esthetic Considerations

- Excavated soil used to construct berm
- Maintain as many existing trees as possible
- 100 new trees to be planted
- Building exterior to be a natural color
- Exterior building lights are motion activated
- No audible exterior alarms
- Chain link fence with privacy screening

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Operation & Maintenance

- Operate 24 hours per day
- Trained personnel visits
  - 3 days per week during initial 6 months
  - Additional visits as needed
- Monitoring plan currently in draft version
- Operation & Maintenance plan to follow
- Establishes method of operating & tracking progress of GWTP

Safety Considerations

- Double-walled extraction piping and access ports
- GWTP sloped floor to sump – contain spills
- Liquid-phase carbon units – Total VOC polish
- Backflow preventor on influent potable water line
- Instrumentation
  - To monitor key operating parameters
  - Redundant controls to ensure safe operation
  - Automatic system shut-down signals
  - Requires manual restart
  - Telemonitoring system to view operation remotely

Future Operating Considerations

- Piping to termination vaults
  - One vault for future discharge location
- Current GWTP flow will be 1100 gpm
  - Maximum capacity = 1375 gpm (+25%)
- GWTP can treat future development water
  - Water piped/transported to GWTP sump

Project Status

- Obtain real estate access agreements from three property owners – Town of Oyster Bay, NYS DOT and Long Island Railroad
- Obtain all necessary local permits
- Competitive bidding for all subcontracted work and equipment
- Mobilize and start construction

Anticipated Schedule

Milestones	Date
Project Planning	On-going
Mobilization & Start of Construction	Fall 2007
End of Construction	Fall 2008
Plant Start-Up and Shakedown	Winter 2008
Start of Operation & Maintenance	Spring 2009

Wrap-up

Questions?