2/9/96-01003

DEPARTMENT OF THE NAVY
Commander
Naval Base Norfolk
1530 Gilbert ST. STE 200
Norfolk, VA 23511-2797

IN REPLY REFER TO:
5090
N42B/059
FEB 09 1996

Mr. David Forsythe
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, VA 23511-2699

RE: RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES

Dear Mr. Forsythe:

Enclosed please find a copy of the minutes from the RAB meeting held on January 24, 1996, a list of the upcoming review schedule, and a RAB Survey Form. The survey form can either be mailed to Ms. Dianne Bailey or turned in at the next RAB meeting.

The next regular RAB meeting is tentatively scheduled for 7:00 p.m. on Thursday, March 14, 1996 in the COMNAVBASE Conference Room, 2nd floor, Building N-26, Gilbert Street, Naval Base, Norfolk.

As a reminder, the special RAB meeting with Ms. Ann Mittermeyer, Assistant General Counsel for the Senate Armed Services Committee, is scheduled for Wednesday, February 21, 1996 at 7:00 p.m. in the Admiral's Conference Room, 2nd floor, Bldg N-26, Gilbert Street, Naval Base, Norfolk.

Ms. Ruth Reich will contact you several days before hand to remind you of the meetings. If you can not attend the regular meeting, please send a substitute. If you have any questions, please call Ms. Dianne Bailey at 444-3009 or Ms. Ruth Reich at 322-2859.

Sincerely,

Sharon L. Waligora

SHARON L. WALIGORA
Director, Hazardous Waste Division
By direction of the Commander

Encl:
(1) RAB Minutes
(2) RAB Review Schedule
(3) RAB Survey Form

ENCLOSURE 1

RESTORATION ADVISORY BOARD MEETING MINUTES

January 24, 1996

Commander Naval Base (COMNAVBASE) Norfolk, conducted a Restoration Advisory Board (RAB) meeting on January, 1996, in Building N-26 at the Naval Base. The meeting commenced at 7:00 p.m. with the following people in attendance.

RAB ATTENDEES:

Dianne Bailey, Navy Co-Chair	COMNAVBASE Norfolk Environmental Programs Department
Dave Forsythe, P.E.	Naval Facilities Engineering Command, Atlantic Division (LANTDIV)
Ruth Reich	COMNAVBASE Public Affairs Office
Dinesh Vithani	Virginia Department of Environmental Quality
Robert Thomson, P.E.	US Environmental Protection Agency
Lee Rosenberg	City of Norfolk, Environmental Services
Deborah Hill (for Karen Gulley)	Norfolk Health Department
Stephen Dembkoski	Glenwood Park Civic Center
Carl Fisher	Elizabeth River Project
Nathaniel Riggins	Titustown Civic League

OTHER ATTENDEES:

Carl Thompson	Elizabeth River Project
Stephen Mihalko	Virginia Department of Environmental Quality
Kirk Foster	COMNAVBASE Visitor

NOT IN ATTENDANCE:

Dr. Raymond Alden	Old Dominion University
Robert Vazquez	National Oceanic & Atmospheric Administration (NOAA)
Peggy Menzies	Willoughby Civic League
Carol Ann Greenwood	Tidewater Community College
Bertram Myers	Algonquin Park Civic League
Karen Gates	Suburban Acres Civic League
Jack Ruffin, Community Co-chair	Chesapeake Bay Foundation

PRESENTERS:

Gordon Ruggaber, P.E.	Naval Base Norfolk Activity Coordinator (Baker)
David Mamrose, P.E.	Project Manager, Building LP-20 (Baker)
Dianne Bailey	COMNAVBASE Norfolk Environmental Programs Department

RAB PRESENTATION SUMMARY:

The meeting was called to order at 7:00 p.m. by Ms. Ruth Reich who provided an introduction of the first presenter, Mr. Gordon Ruggaber of Baker Environmental, Inc.

CD Landfill Presentation

RAB members were given the opportunity to review the Draft Final Remedial Investigation (RI) Report during July/August 1995 and the Draft Final Feasibility Study Report in late December 1995 and January 1996. Since the results of the Remedial Investigation and Human Health Risk Assessment (included in the RI Report) were present during the last RAB meeting on October 12, 1995, the purpose of this meeting was to present the findings of the Feasibility Study.

The presentation summarized the study's findings as follows:

- Evaluation of cleanup technologies and remedial alternatives in the FS was based on potential risks associated with contamination in the on-site soils, sediments, and shallow groundwater. The shallow groundwater at the site is not suitable as a potable (drinking) water supply due to high dissolved solids, iron and manganese, and low pH.

- Risk assessment results indicate that there is no current risk to human health caused by the landfill, which is currently fenced and not used for any purpose. The remedial alternatives were primarily based upon a potential future civilian worker scenario. This scenario assumes that a civilian worker would come into routine contact with surface soils, sediment, and shallow groundwater through maintenance activities, such as lawn mowing and lawn watering using shallow groundwater.

- Sediment cleanup alternatives were based primarily on protection of aquatic and terrestrial organisms exposed to the on-site drainage ditches. Two different types of cleanup levels were considered: effect-range low (ER-L); and effects-range median (ER-M). The more conservative ER-L cleanups level would require excavation and disposal of approximately 980 cubic yards of sediment, whereas the less conservative ER-M cleanup levels would only require removal of about 190 cubic yards of sediment.

- The following remedial alternatives and associated 30-year net present worth (NPW) costs were developed in the FS:

Soil

- Alternative SO-1: No Action, NPW = $0
- Alternative SO-2: Institutional Controls, NPW = $69,000
- Alternative SO-3: Soil Cap with Institutional Controls, NPW = $2,266,000
- Alternative SO-4: Composite Cap with Institutional Controls, NPW = $5,978,000

Groundwater

- Alternative GW-1: No Action, NPW = $0
- Alternative GW-2: Institutional Controls (I.C.) with Monitoring, NPW = $1,024,000
- Alternative GW-3: Groundwater Extraction/Treatment with I.C. and Monitoring, NPW = $2,455,000

Sediment

- Alternative SD-1: No Action, NPW = $0
- Alternative SD-2A: Removal/Off-Site Disposal, ER-L Cleanup Level, NPW = $768,000
- Alternative SD-2B: Removal/Off-Site Disposal, ER-M Cleanup Level, NPW =$194,000

Questions:

1. *Will the sediment removal alternatives remove both the organic and inorganic (metal) contaminants and where are these contaminants located?*

   The contaminated areas defined by the ER-L and ER-M cleanup levels include all contaminants of concern, both organic and inorganic (metal) contaminants. The major organic contaminants include dieldrin (a pesticide), PCBs, and polyaromatic hydrocarbons (PAHs), which are found in tars and asphalts. The inorganic contaminants consist of several metals, including lead, copper, and cadmium. Most of the contamination is located along a segment of the southern drainage ditch. Therefore, removal of this stretch of sediment would remove a high percentage of the contaminants in the drainage ditch.

2. *Where will the sediments be disposed?*

   The sediments will most likely be disposed of in an approved, permitted solid waste disposal facility. The facility will be required to meet all applicable State and Federal standards to ensure adequate protection of the environment.

Building LP-20 Presentation

RAB members were given the opportunity to review the Draft Final Remedial Investigation (RI) Report and the Draft Final Feasibility Study Report, which were submitted in early December 1995. The presentation summarized the findings of these reports. The major points of the meeting are as follows:

- The results of the human health risk assessment (in the RI Report) indicated potential unacceptable risks associated with the following exposure scenarios and contaminated media:

- Current/future maintenance and industrial workers:	shallow groundwater (direct contact)
- Future construction workers:	shallow groundwater
- Future adult military residents:	shallow and deep groundwater
- Future child military residents:	shallow and deep groundwater, soils

- The shallow groundwater at the site is not suitable as a potable (drinking) water supply due to high dissolved solids, iron and manganese, and low pH. The deep groundwater (Yorktown Aquifer) at the site is also not suitable as a potable water supply due to high salinity (salt water content).

- Evaluation of cleanup technologies and remedial alternatives in the FS was based on potential risks associated with contamination in the shallow and deep groundwater. Groundwater cleanup levels were developed based on non-potable use of groundwater, such as lawn watering and vehicle washing.

- The following remedial alternatives and associated 30-year net present worth (NPW) costs were developed in the FS:

Shallow Groundwater

- Alternative 1S: No Action, NPW = $0
- Alternative 2S: Institutional Controls (I.C.) with Monitoring, NPW = $373,000
- Alternative 3S: Air Sparging with I.C. and Monitoring, NPW = $2,012,000
- Alternative 4S: In-well Aeration with I.C. and Monitoring, NPW = $2,506,00
- Alternative 5S: Groundwater Extraction/Treatment with I.C. and Monitoring, NPW = $5,035,000

Yorktown Aquifer

- Alternative 1D: No Action, NPW = $0
- Alternative 2D: Institutional Controls (I.C.) with Monitoring, NPW = $369,000
- Alternative 3D: In-well Aeration with I.C. and Monitoring, NPW = $1,571,00
- Alternative 4D: Groundwater Extraction/Treatment with I.C. and Monitoring, NPW = $2,723,000

Questions:

1. *Why are the in-well aeration alternatives (Alternatives 4S and 3Y) less costly than the extraction/treatment alternatives (5S and 4Y) when the in-well aeration alternatives require installation of many more wells?*

The present-worth cost for the in-well aeration alternatives (Alternatives 4S and 3Y) is based on 15 years of operation, whereas the extraction/treatment alternatives are based on a 30-year operation period. Although the number of years required to achieve the cleanup levels is very difficult to predict, in-well aeration is expected to cleanup the groundwater significantly faster than traditional extraction and treatment (i.e., "pump and treat"). In addition to a shorter treatment time, annual operation and maintenance costs are expected to be lower for the in-well aeration system since much less equipment, power, and chemicals are needed.

2. *Does the in-well aeration system enhance biodegradation of contaminants?*

The in-well aeration system will enhance biodegradation of biodegradable contaminants, such as benzene, by increasing the oxygen content of the groundwater. However, most of the solvent-related contaminants at LP-20, such as trichloroethylene (TCE), are not very biodegradable. Therefore, the in-well aeration system will remove the TCE and other contaminants primarily through volatilization.

3. *Is the design dependent on the groundwater flow and how well is the groundwater flow characterized?*

The different groundwater alternatives are dependent on the groundwater flow direction and aquifer properties. The groundwater flow directions in both the shallow and deep (Yorktown) aquifers were accurately determined during the field investigation. Various aquifer tests, including a 2-day pumping test, were performed to determine the flow properties of the aquifer, such as hydraulic conductivity. In general, the aquifer data collected at the LP-20 Site are consistent with the data collected from other sites at the Naval Base.

4. *Is the source of the TCE contamination known, such as a floor drain?*

The exact source of the TCE in the groundwater could not be identified during the field investigation. The TCE may have entered the groundwater through one or more old (discontinued) floor drains or from a past spill. The release of TCE may have quite possibly occurred many years ago (i.e., 1940's or 1950's) when Building LP-20 had either a dirt or brick floor.

5. *Do the net present worth costs for the groundwater treatment alternatives include the cost of monitoring the performance of the treatment systems?*

Yes, all net present worth costs include routine sampling of existing monitoring wells to evaluate the effectiveness of the treatment system.

6. *What was the highest concentration of TCE detected at the site?*

TCE has detected at 44,000 parts per billion (ppb) in well , which is a shallow monitoring well. Although this level is very high, it appears that the bowl-shaped clay layer beneath the site is helping to reduce downstream migration of the contaminants and confine the contamination to the LP-20/LP-26 area.

General Update

Dianne Bailey provided a brief discussion on current status of the Camp Allen Landfill remedial construction project and the Q-Area Drum Storage Yard remedial design. The major points are outlined below.

Camp Allen Landfill

- OHM Remediation Services Corporation is on site and is currently in the process of constructing the building foundation for the groundwater treatment system.
- A briefing to outline the upcoming construction activities is planned for the Elementary School, Naval Brig, and Marine Corps Barracks for February of this year.
- Startup of the groundwater treatment system is planned for November 1996.
- The Navy Public Works Center will operate the treatment system.
- A RAB tour of the site is planned for Spring/Summer of this year.

Q-Area Drum Storage Yard

- The investigation contractor, ESE, is working on a revised version of the RI/FS based on comments from the EPA and Virginia Department of Environmental Quality.
- Preliminary results of the revised risk assessment show no unacceptable risks from exposure to site soils.
- Navy personnel are currently removing the wood/concrete drum racks on site.
- Construction of the groundwater air sparging systems is planned for this Summer with startup of the full-scale systems scheduled for Summer 1997.
- COMNAVBASE is planning to use the Q-Area for recreational purposes.

Administrative Issues

Dianne Bailey discussed administrative issues as follows:

1. RAB Members Review Schedule

   - Q-Area Drum Storage Yard Revised RI/FS - Submittal has been delayed. A new submittal date has not yet been established.

- CD Landfill Draft Final FS - Received by RAB members on 12/21/95, comments due 2/15/96

- LP-20 Draft Final RI/FS - Received by RAB members on 12/1/95, comments due 2/15/96

2. Next RAB meeting is tentatively scheduled for March 28, 1996.

3. Dianne distributed a survey to the RAB members to obtain their input on the RAB meetings (e.g., meeting frequency, length, time, type of presentation). The RAB members may mail in the survey or bring it to the next RAB meeting.

Dianne Bailey closed the meeting at approximately 8:00 p.m.

RESTORATION ADVISORY BOARD
Review Schedule

Project Item	*Received by RAB Members*	*RAB Members Return Comments*	*Completed*
Q-Area Drum Storage Yard - Revised RI/FS	DELAYED	DELAYED	
CD Landfill - Draft Final FS	December 21, 1995	February 15, 1996	
Building LP-20 - Draft Final RI/FS	December 1, 1995	February 15, 1996	
CD Landfill - Draft Final PRAP	March 30, 1996	April 30, 1996	
Building LP-20 - Draft Final PRAP	April 30, 1996	May 30, 1996	

ENCL (2)

RESTORATION ADVISORY BOARD SURVEY - JANUARY 1996

1. Do you think the length of the RAB meetings is: Too long OK Too short

2. Is the time of the RAB meeting convenient? If not what day/time is more convenient? Time is convenient This day/time would be more convenient _____

3. What day/time is most convenient for a tour of the sites? Weekday time_____ Saturday time_____

4. Are the presentations: Too detailed OK Not detailed enough

5. Community member 2 year terms expire on September 30, 1996. Would you like to be a RAB member for another term? Yes No

6. Do you think the policy of missing 2 consecutive meetings and being taken off the RAB is fair? If not, how many meetings should you be allowed to miss? Yes No,_____

7. Do you agree that since the Norfolk Naval Base is an "open" base, meetings can be held on base (at no cost to COMNAVBASE)? Agree Disagree

8. Please give any other comments so we can improve the RAB_____

_____

_____

_____

_____

_____

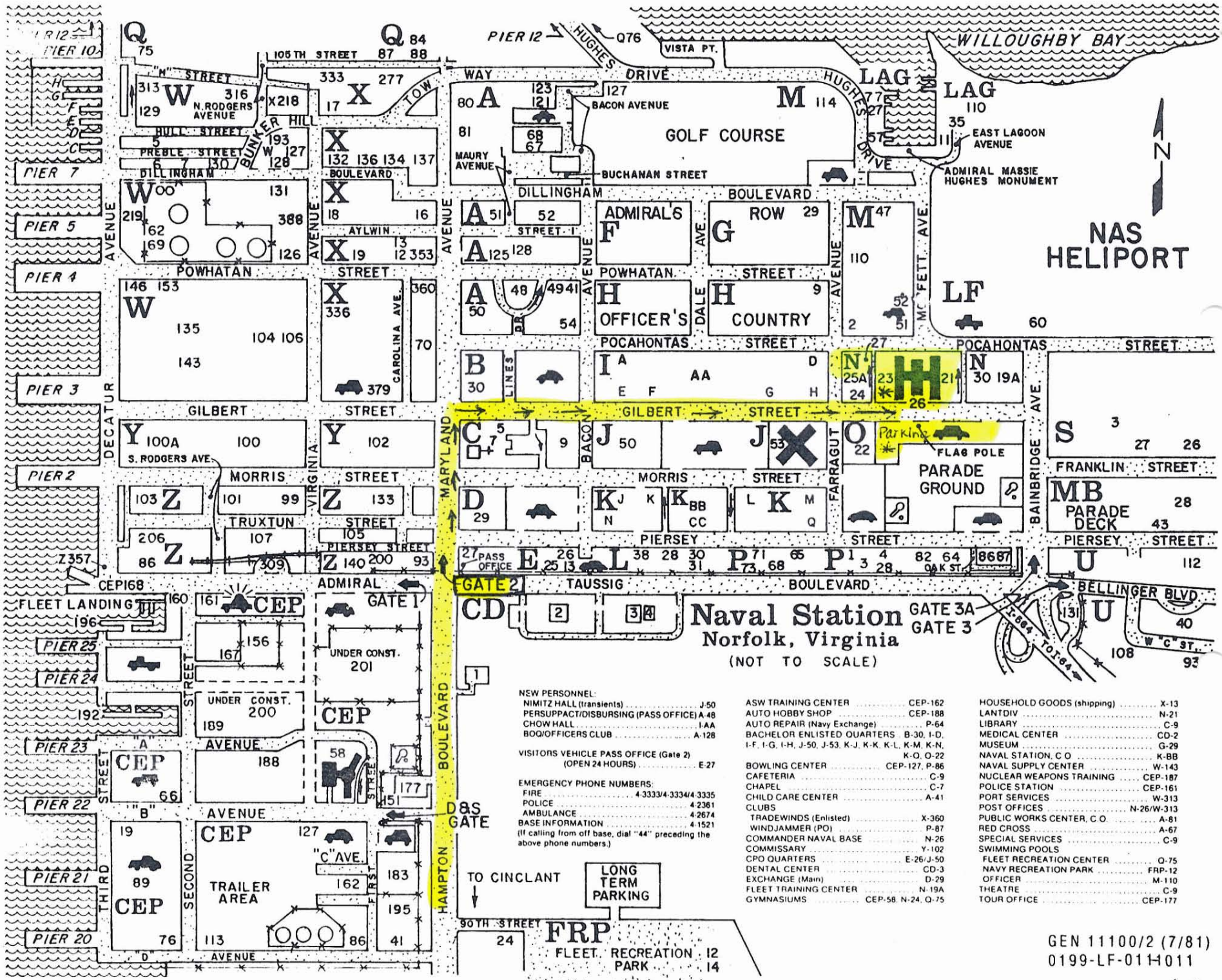
ENCL (3)

1/24/96-01003

RESTORATION ADVISORY BOARD MEETING

JANUARY 24, 1996

7:00	Introduction/Welcome	Ruth Reich COMNAVBASE - Public Affairs
7:10	CD Landfill Update	Gordon Ruggaber - Baker Environmental, Inc.
7:25	Questions	
7:35	Break	
7:50	Building LP-20 Update	Dave Mamrose - Baker Environmental, Inc.
8:05	Questions	
8:15	General Update - Camp Allen Landfill - Q-Area Drum Storage Yard	Dianne Bailey - Navy Co-chair
8:20	Administrative Issues	Dianne Bailey - Navy Co-chair Jack Ruffin - Community Co-chair
8:25	General Questions/Comments	



NEW PERSONNEL:

NIMITZ HALL (transients)	J-50
PERSUPPACT/DISBURSING (PASS OFFICE)	A-48
CHOW HALL	I-AA
BOQ/OFFICERS CLUB	A-128

VISITORS VEHICLE PASS OFFICE (Gate 2) (OPEN 24 HOURS) E-27

EMERGENCY PHONE NUMBERS:

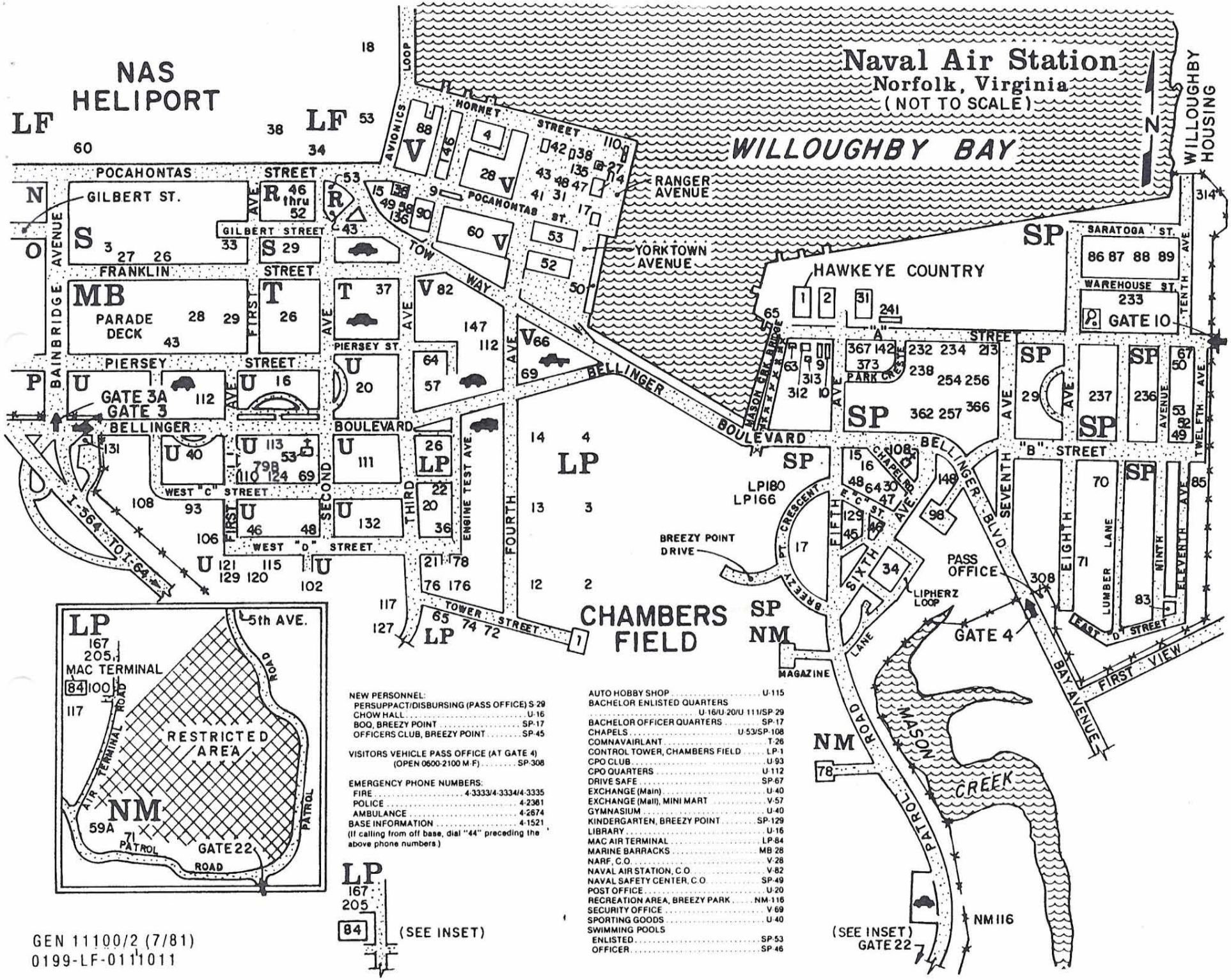
FIRE	4-3333/4-3334/4-3335
POLICE	4-2361
AMBULANCE	4-2674
BASE INFORMATION	4-1521

(If calling from off base, dial "44" preceding the above phone numbers.)

ASW TRAINING CENTER	CEP-162
AUTO HOBBY SHOP	CEP-188
AUTO REPAIR (Navy Exchange)	P-64
BACHELOR ENLISTED QUARTERS	B-30, I-D, I-F, I-G, I-H, J-50, J-53, K-J, K-K, K-L, K-M, K-N, K-O, O-22
BOWLING CENTER	CEP-127, P-86
CAFETERIA	C-9
CHAPEL	C-7
CHILD CARE CENTER	A-41
CLUBS	
TRADEWINDS (Enlisted)	X-360
WINDJAMMER (PO)	P-87
COMMANDER NAVAL BASE	N-26
COMMISSARY	Y-102
CPO QUARTERS	E-26/J-50
DENTAL CENTER	CD-3
EXCHANGE (Main)	D-29
FLEET TRAINING CENTER	N-19A
GYMNASIUMS	CEP-58, N-24, Q-75
HOUSEHOLD GOODS (shipping)	X-13
LANTDIV	N-21
LIBRARY	C-9
MEDICAL CENTER	CD-2
MUSEUM	G-29
NAVAL STATION, C O	K-BB
NAVAL SUPPLY CENTER	W-143
NUCLEAR WEAPONS TRAINING	CEP-187
POLICE STATION	CEP-161
PORT SERVICES	W-313
POST OFFICES	N-26/W-313
PUBLIC WORKS CENTER, C O	A-81
RED CROSS	A-67
SPECIAL SERVICES	C-9
SWIMMING POOLS	
FLEET RECREATION CENTER	Q-75
NAVY RECREATION PARK	FRP-12
OFFICER	M-110
THEATRE	C-9
TOUR OFFICE	CEP-177

GEN 11100/2 (7/81)
0199-LF-011H011

Encl (1)



NEW PERSONNEL:

PERSUPPACT/DISBURSING (PASS OFFICE)	S-29
CHOW HALL	U-16
BOQ, BREEZY POINT	SP-17
OFFICERS CLUB, BREEZY POINT	SP-45

VISITORS VEHICLE PASS OFFICE (AT GATE 4)
(OPEN 0600-2100 M-F) SP-308

EMERGENCY PHONE NUMBERS:

FIRE	4-3333/4-3334/4-3335
POLICE	4-2361
AMBULANCE	4-2674
BASE INFORMATION	4-1521

(If calling from off base, dial "44" preceding the above phone numbers.)

AUTO HOBBY SHOP	U-115
BACHELOR ENLISTED QUARTERS	U-16/U-20/U-111/SP-29
BACHELOR OFFICER QUARTERS	SP-17
CHAPELS	U-53/SP-108
COMNAVAIRLANT	T-26
CONTROL TOWER, CHAMBERS FIELD	LP-1
CPO CLUB	U-93
CPO QUARTERS	U-112
DRIVE SAFE	SP-67
EXCHANGE (Main)	U-40
EXCHANGE (Mall), MINI MART	V-57
GYMNASIUM	U-40
KINDERGARTEN, BREEZY POINT	SP-129
LIBRARY	U-15
MAC AIR TERMINAL	LP-84
MARINE BARRACKS	MB-28
NARF, C.O.	V-28
NAVAL AIR STATION, C.O.	V-82
NAVAL SAFETY CENTER, C.O.	SP-49
POST OFFICE	U-20
RECREATION AREA, BREEZY PARK	NM-116
SECURITY OFFICE	V-69
SPORTING GOODS	U-40
SWIMMING POOLS	
ENLISTED	SP-53
OFFICER	SP-46

GEN 11100/2 (7/81)
0199-LF-0111011

- cap would be DERA fundable due to RCRA or state

Baker

Baker Environmental, Inc

CD LANDFILL
REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
NAVAL BASE, NORFOLK, VIRGINIA

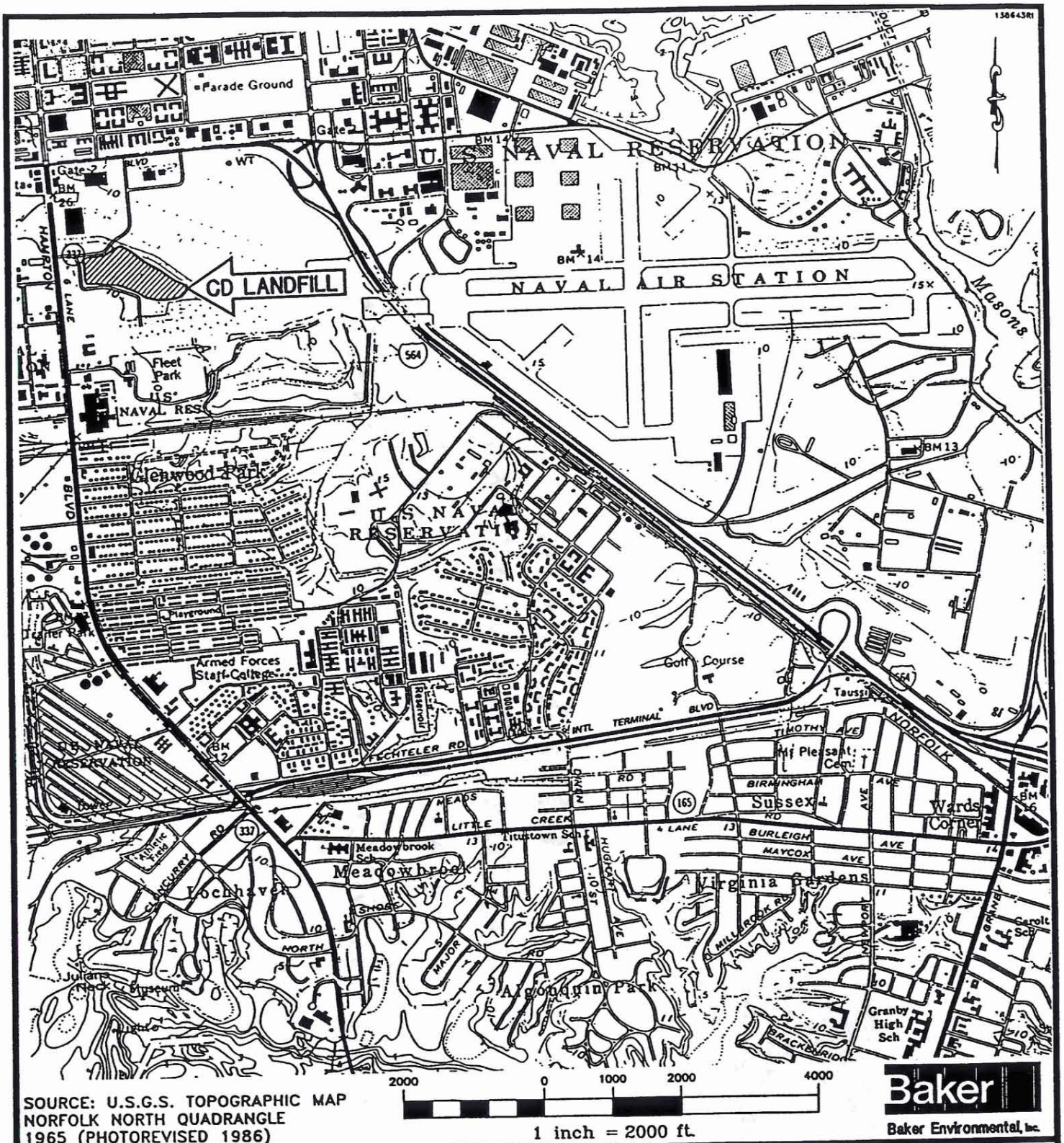


FIGURE 1-1
SITE LOCATION MAP
CD LANDFILL

NORFOLK NAVAL BASE
NORFOLK, VIRGINIA

Baker

Baker Environmental, Inc.

CD LANDFILL, HUMAN HEALTH AND ECOLOGICAL RISK SUMMARY

Exposure Scenario	Unacceptable Risk
Current Military Personnel	None
Current/Future Trespassers	Sediment
Future Construction Workers	None
Future Civilian Workers (routine maintenance)	Sediment, shallow groundwater (non potable (not drinking))
Future On-Site Residents	Sediment, shallow groundwater, (drinking) subsurface soil
Aquatic Receptors (drainage ditches)	Sediment

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Baker Environmental, Inc.

CD LANDFILL, FEASIBILITY STUDY ALTERNATIVES

Soil

- SO-1: No Action, NPW = $0
- SO-2: Institutional Controls, NPW = $69,000
- SO-3: Soil Cap with Institutional Controls, NPW = $2,266,000 surface
- SO-4: Composite Cap with Institutional Controls, NPW = $5,978,000 leaching GW

Groundwater

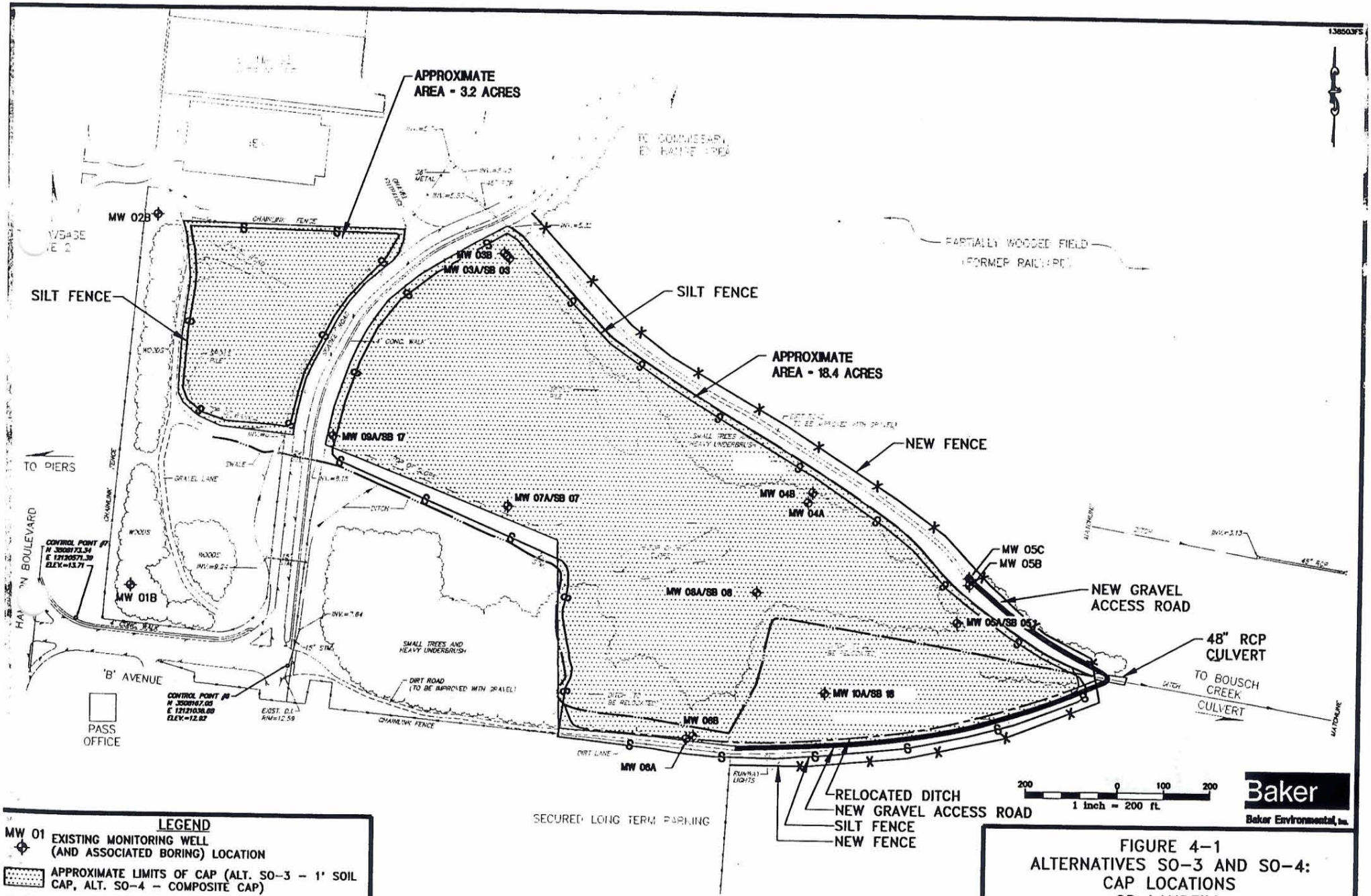
- GW-1: No Action, NPW = $0
- GW-2: Institutional Controls with Monitoring, NPW = $1,024,000
- GW-3: Groundwater Extraction/Treatment with I.C. and Monitoring, NPW=$2,455,000

Sediment

based on ecological

- SD-1: No Action, NPW = $0
- SD-2A: Removal/Off-Site Disposal, ER-L Cleanup Level (980 C.Y.), NPW=$768,000
- SD-2B: Removal/Off-Site Disposal, ER-M Cleanup Level (190 C.Y.), NPW=$194,000

NPW = 30-Year Net Present Worth Cost



LEGEND

MW 01 — EXISTING MONITORING WELL (AND ASSOCIATED BORING) LOCATION

APPROXIMATE LIMITS OF CAP (ALT. SO-3 – 1' SOIL CAP, ALT. SO-4 – COMPOSITE CAP)

MW 01 — MONITORING WELL TO BE ABANDONED

SOURCE: HOGGARD/EURE, SEPTEMBER 1993

FIGURE 4-1
ALTERNATIVES SO-3 AND SO-4:
CAP LOCATIONS
CD LANDFILL
NAVAL BASE NORFOLK
NORFOLK, VIRGINIA

Baker

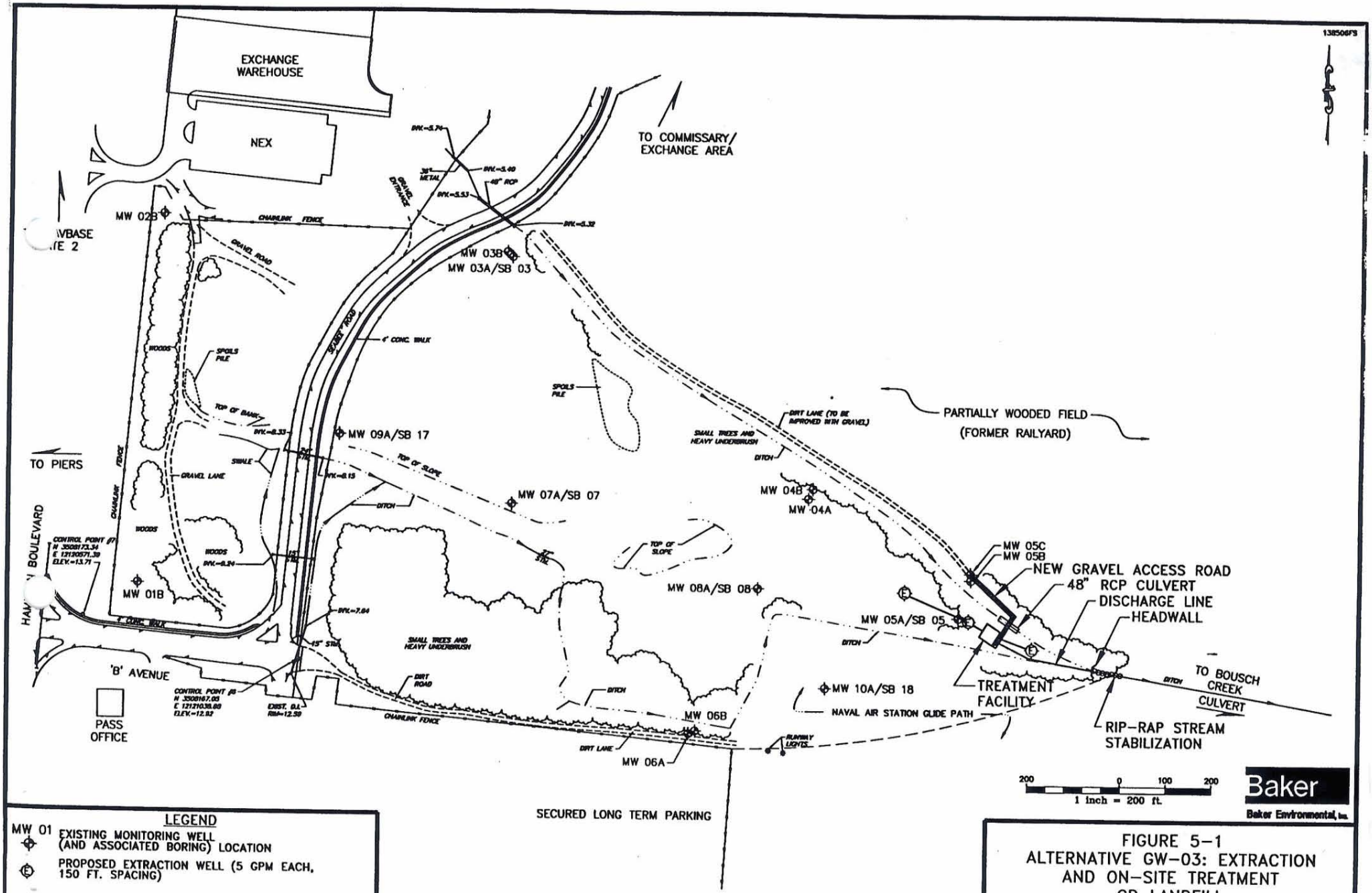
Baker Environmental, Inc.

CD LANDFILL, FEASIBILITY STUDY (Continued)

Groundwater Contaminants of Concern

Contaminant	Cleanup Level (μg/L)
• Chlorobenzene	100
• 1,4-dichlorobenzene	20

was: petroleum products



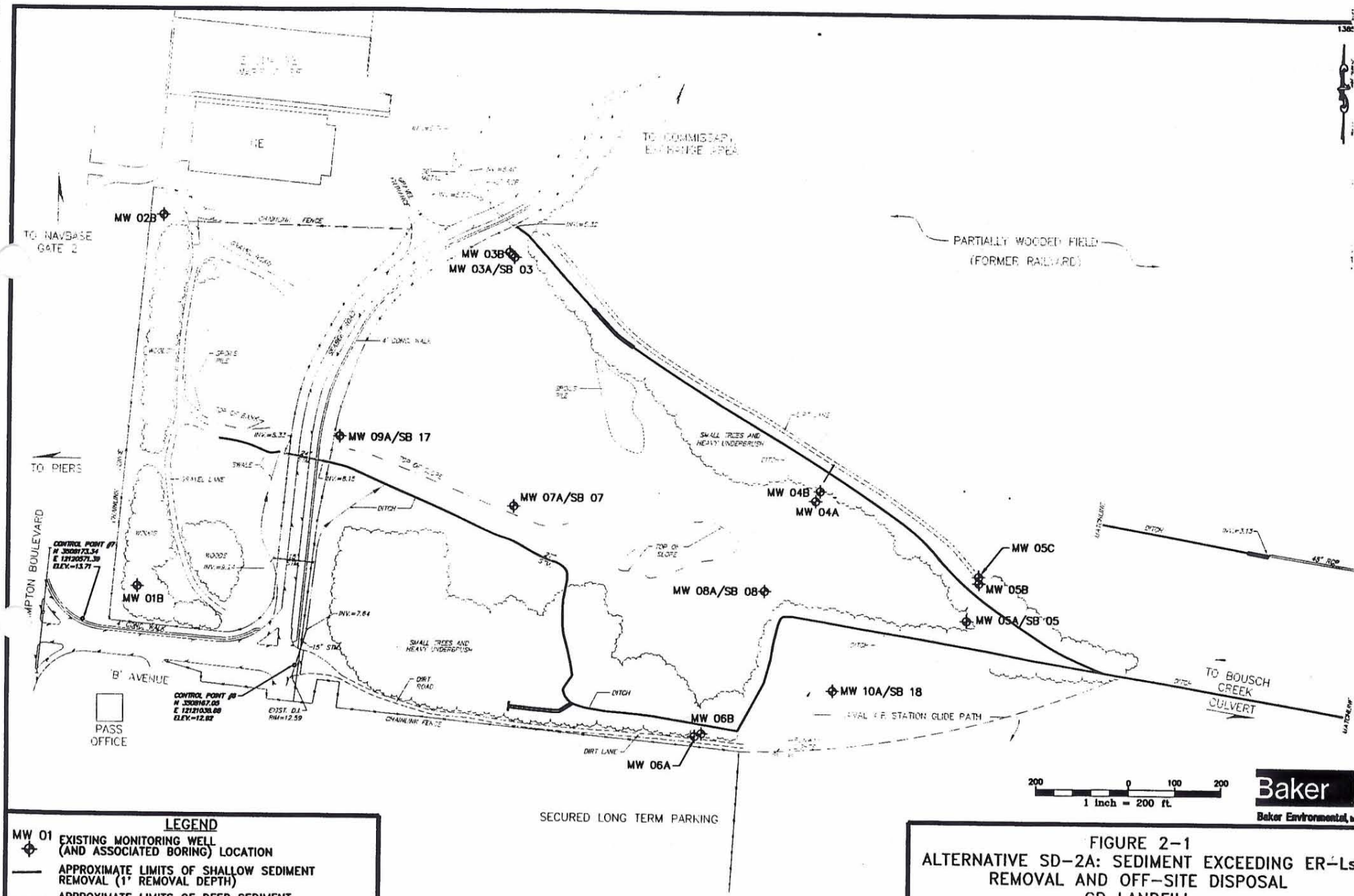
LEGEND

MW 01 EXISTING MONITORING WELL (AND ASSOCIATED BORING) LOCATION

PROPOSED EXTRACTION WELL (5 GPM EACH, 150 FT. SPACING)

SOURCE: HOGGARD/EURE, SEPTEMBER 1993

FIGURE 5-1
ALTERNATIVE GW-03: EXTRACTION AND ON-SITE TREATMENT
CD LANDFILL
NAVAL BASE NORFOLK
NORFOLK, VIRGINIA



LEGEND

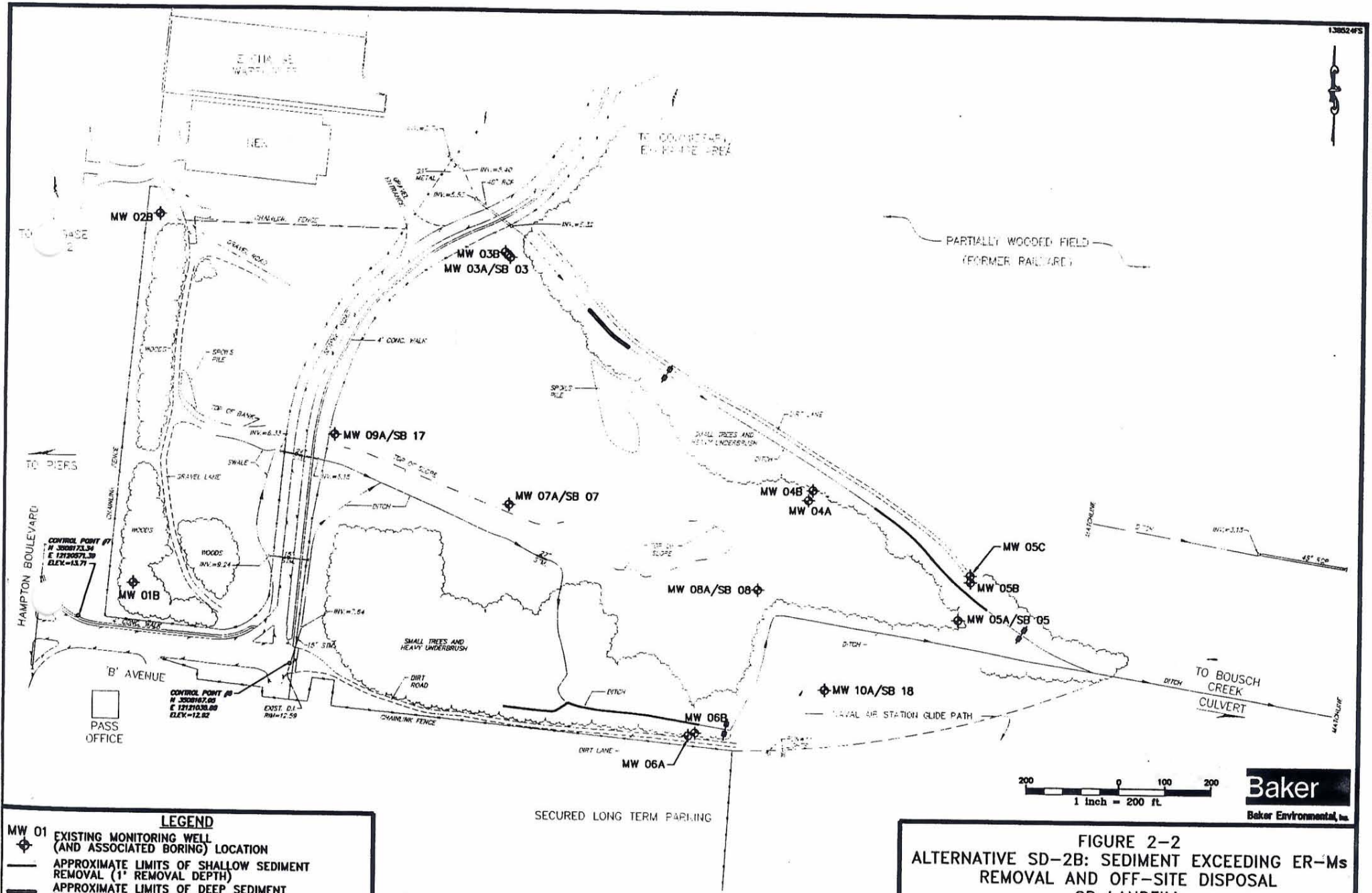
MW 01 ◈ EXISTING MONITORING WELL (AND ASSOCIATED BORING) LOCATION

—— APPROXIMATE LIMITS OF SHALLOW SEDIMENT REMOVAL (1' REMOVAL DEPTH)

▬▬ APPROXIMATE LIMITS OF DEEP SEDIMENT REMOVAL (1' TO 2.5' REMOVAL DEPTH)

SOURCE: HOGGARD/EURE, SEPTEMBER 1993

FIGURE 2-1
ALTERNATIVE SD-2A: SEDIMENT EXCEEDING ER-Ls REMOVAL AND OFF-SITE DISPOSAL
CD LANDFILL
NAVAL BASE NORFOLK
NORFOLK, VIRGINIA



LEGEND

- MW 01 — EXISTING MONITORING WELL (AND ASSOCIATED BORING) LOCATION
- APPROXIMATE LIMITS OF SHALLOW SEDIMENT REMOVAL (1' REMOVAL DEPTH)
- APPROXIMATE LIMITS OF DEEP SEDIMENT REMOVAL (1' TO 2.5' REMOVAL DEPTH)
- STRAW BALES

SOURCE: HOGGARD/EURE, SEPTEMBER 1993

FIGURE 2-2
ALTERNATIVE SD-2B: SEDIMENT EXCEEDING ER-Ms REMOVAL AND OFF-SITE DISPOSAL
CD LANDFILL
NAVAL BASE NORFOLK
NORFOLK, VIRGINIA

Baker

Baker Environmental, Inc.

CD LANDFILL, SCHEDULE OF WORK

- Submittal of Draft Final FS Report - December 20, 1995
- Submittal of Final RI Report - December 26, 1995
- Sediment Areas of Concern Development (New Fields) - February 1996
- Submittal of Final FS Report and Proposed Remedial Action Plan (PRAP) - March/April 1996
- Public Comment Period - April/May 1996
- Submittal of Decision Document - June 1996
- Implementation of Remedial Action

Baker

Baker Environmental, Inc

BUILDING LP-20 SITE
REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
NAVAL BASE, NORFOLK, VIRGINIA

Baker

Baker Environmental, Inc.

BUILDING LP-20 SITE, SCHEDULE OF WORK

- Draft Final RI Report - December 1, 1995
- Draft FS Report - December 4, 1995
- Final RI/FS Report - February 1996
- Draft Proposed Remedial Action Plan (PRAP) - February 1996
- Public Comment Period - May/June 1996
- Final Decision Document - August 1996
- Implementation of Remedial Action

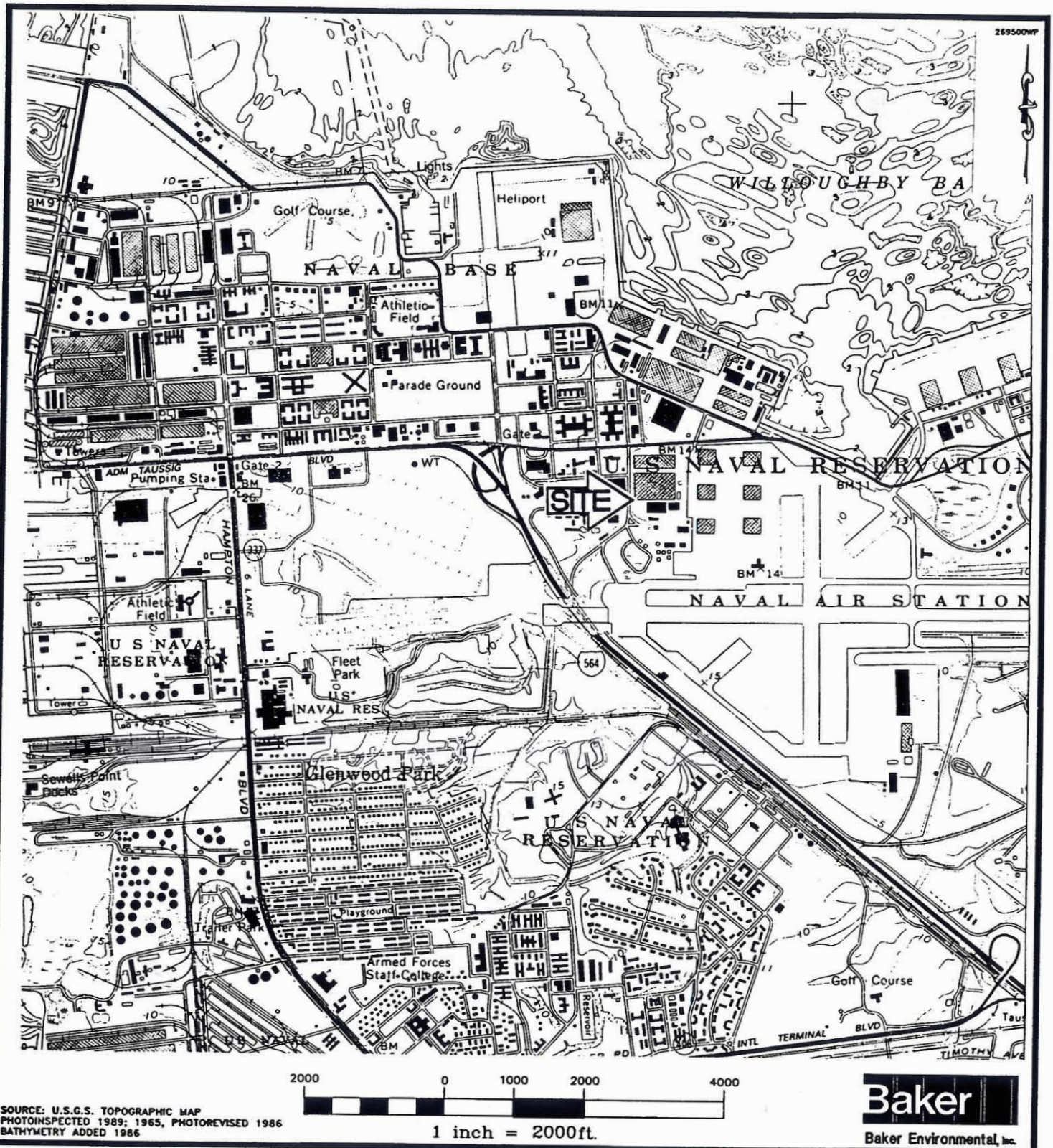


FIGURE 1-1
SITE LOCATION MAP
BUILDING LP-20 SITE
FEASIBILITY STUDY CTO-0269

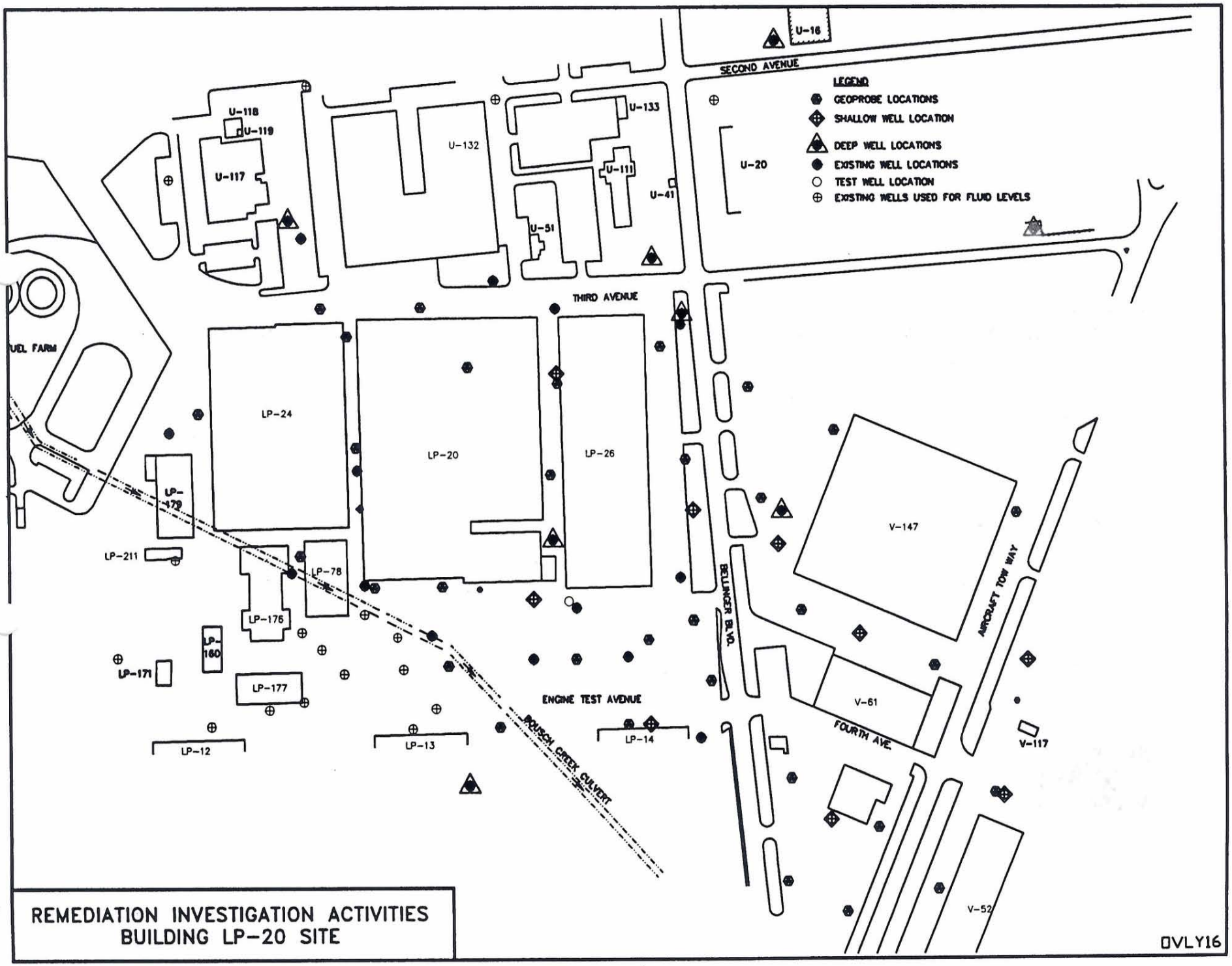
NAVAL BASE NORFOLK
NORFOLK, VIRGINIA

Baker

Baker Environmental, Inc.

BUILDING LP-20 SITE, BACKGROUND

- Site area located within Bousch Creek Drainage System
- Building constructed in 1940's
- Metal plating operations - moved to LP-24 in 1987
- Releases
  - Petroleum products
  - Industrial wastewater
- Several Previous Investigations
- BRAC closure


U-16
SECOND AVENUE
LEGEND
GEOPROBE LOCATIONS
SHALLOW WELL LOCATION
DEEP WELL LOCATIONS
EXISTING WELL LOCATIONS
TEST WELL LOCATION
EXISTING WELLS USED FOR FLUID LEVELS
U-118
U-119
U-117
U-132
U-133
U-111
U-41
U-51
U-20
THIRD AVENUE
FUEL FARM
LP-24
LP-20
LP-26
LP-179
LP-211
LP-78
LP-176
LP-160
LP-171
LP-177
LP-12
LP-13
LP-14
ENGINE TEST AVENUE
POUSCH CREEK CULVERT
BELLINGER BLVD.
V-147
AIRCRAFT TOW WAY
V-61
FOURTH AVE.
V-117
V-52
REMEDIATION INVESTIGATION ACTIVITIES
BUILDING LP-20 SITE
OVLY16

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BUILDING LP-20 SITE, HUMAN HEALTH RISK SUMMARY

Exposure Scenario	Unacceptable Risk
Current/Future Maintenance and Industrial Workers	Shallow groundwater (direct contact)
Future Construction Workers	Shallow groundwater
Future Adult Military Residents	Shallow and deep groundwater potable use
Future Child Military Residents	Soils, shallow and deep groundwater

BUILDING LP-20 SITE, FEASIBILITY STUDY

Groundwater Contaminants of Concern

Contaminant	Cleanup Level (µg/L)
• Vinyl Chloride	6
• Trichloroethene	136
• 1,1-dichloroethene	11
• 1,2-dichloroethane	172
• 1,2-dichloroethene	306
• Benzene	19

solvent

petroleum

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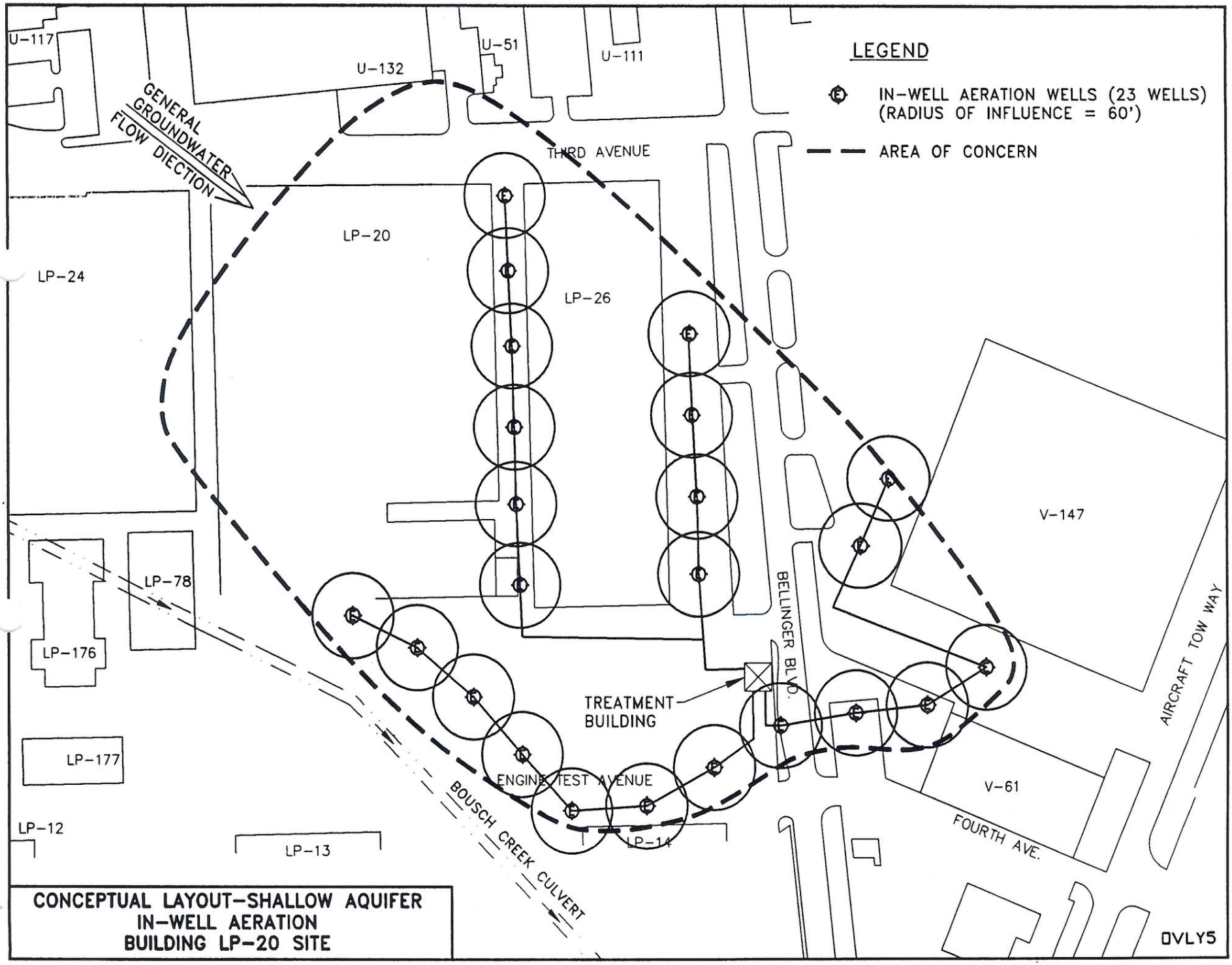
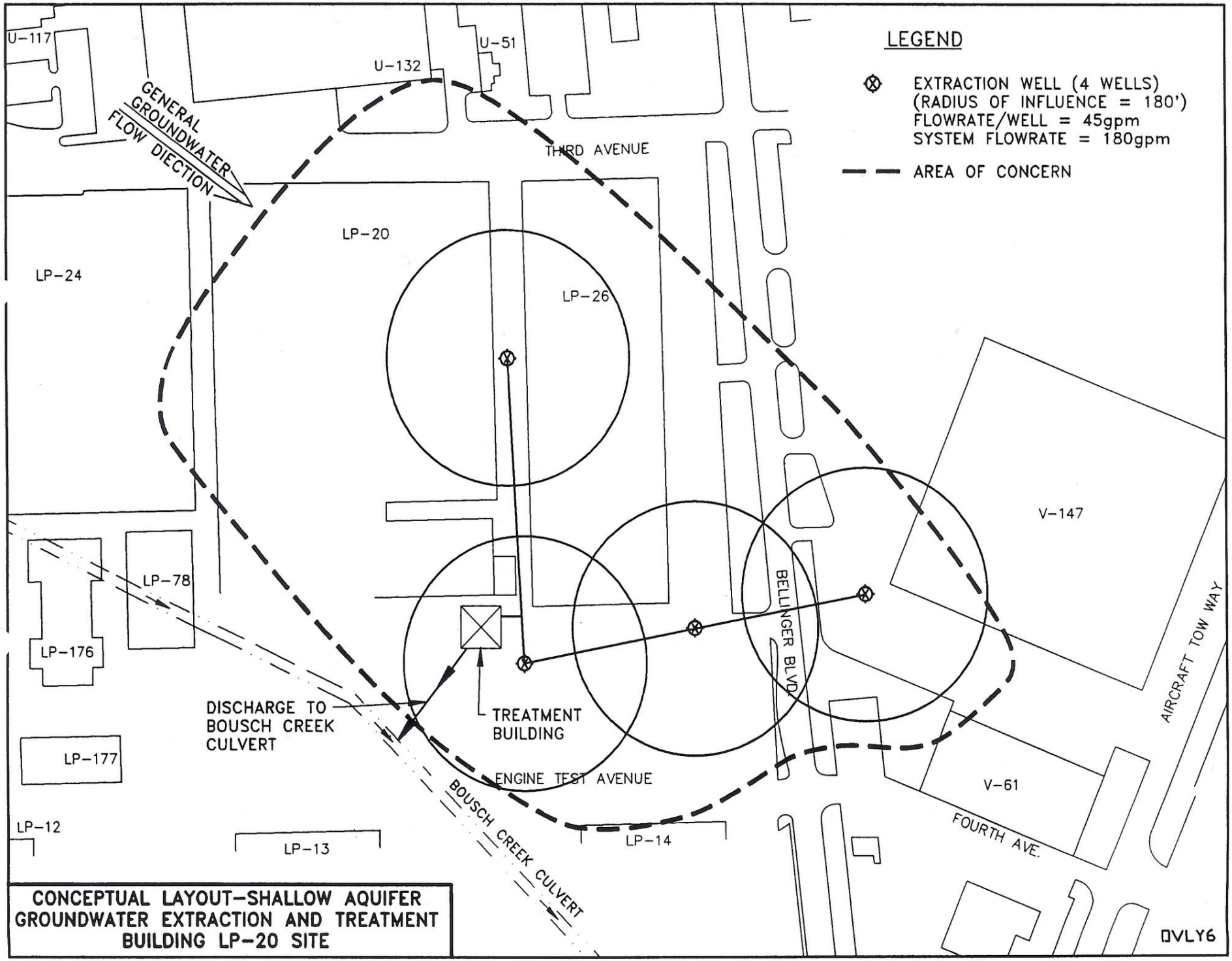
BUILDING LP-20 SITE, FEASIBILITY STUDY

REMEDIAL ACTION ALTERNATIVES - (Shallow Aquifer)

- 1S: No Action, NPW = $0
- 2S: Institutional Controls, with Monitoring, NPW = $373,000
- 3S: Air Sparging and Soil Vapor Extraction, NPW = $2,012,000
- 4S: In-well Aeration, NPW = $2,506,000
- 5S: Groundwater Extraction and Treatment, NPW = $5,035,000

NPW = 30-Year Net Present Worth Cost


LEGEND
IN-WELL AERATION WELLS (23 WELLS)
(RADIUS OF INFLUENCE = 60')
AREA OF CONCERN
U-117
U-132
U-51
U-111
GENERAL GROUNDWATER FLOW DIECTION
THIRD AVENUE
LP-20
LP-24
LP-26
V-147
LP-78
LP-176
BELLINGER BLVD.
AIRCRAFT TOW WAY
TREATMENT BUILDING
LP-177
ENGINE TEST AVENUE
V-61
FOURTH AVE.
LP-12
LP-13
LP-14
BOUSCH CREEK CULVERT
CONCEPTUAL LAYOUT-SHALLOW AQUIFER
IN-WELL AERATION
BUILDING LP-20 SITE
OVLY5


LEGEND
EXTRACTION WELL (4 WELLS)
(RADIUS OF INFLUENCE = 180')
FLOWRATE/WELL = 45gpm
SYSTEM FLOWRATE = 180gpm
AREA OF CONCERN
U-117
U-132
U-51
GENERAL GROUNDWATER FLOW DIECTION
THIRD AVENUE
LP-20
LP-24
LP-26
V-147
LP-78
LP-176
BELLINGER BLVD.
AIRCRAFT TOW WAY
DISCHARGE TO BOUSCH CREEK CULVERT
TREATMENT BUILDING
LP-177
ENGINE TEST AVENUE
V-61
FOURTH AVE.
LP-12
LP-13
LP-14
BOUSCH CREEK CULVERT
CONCEPTUAL LAYOUT-SHALLOW AQUIFER GROUNDWATER EXTRACTION AND TREATMENT BUILDING LP-20 SITE
OVLY6

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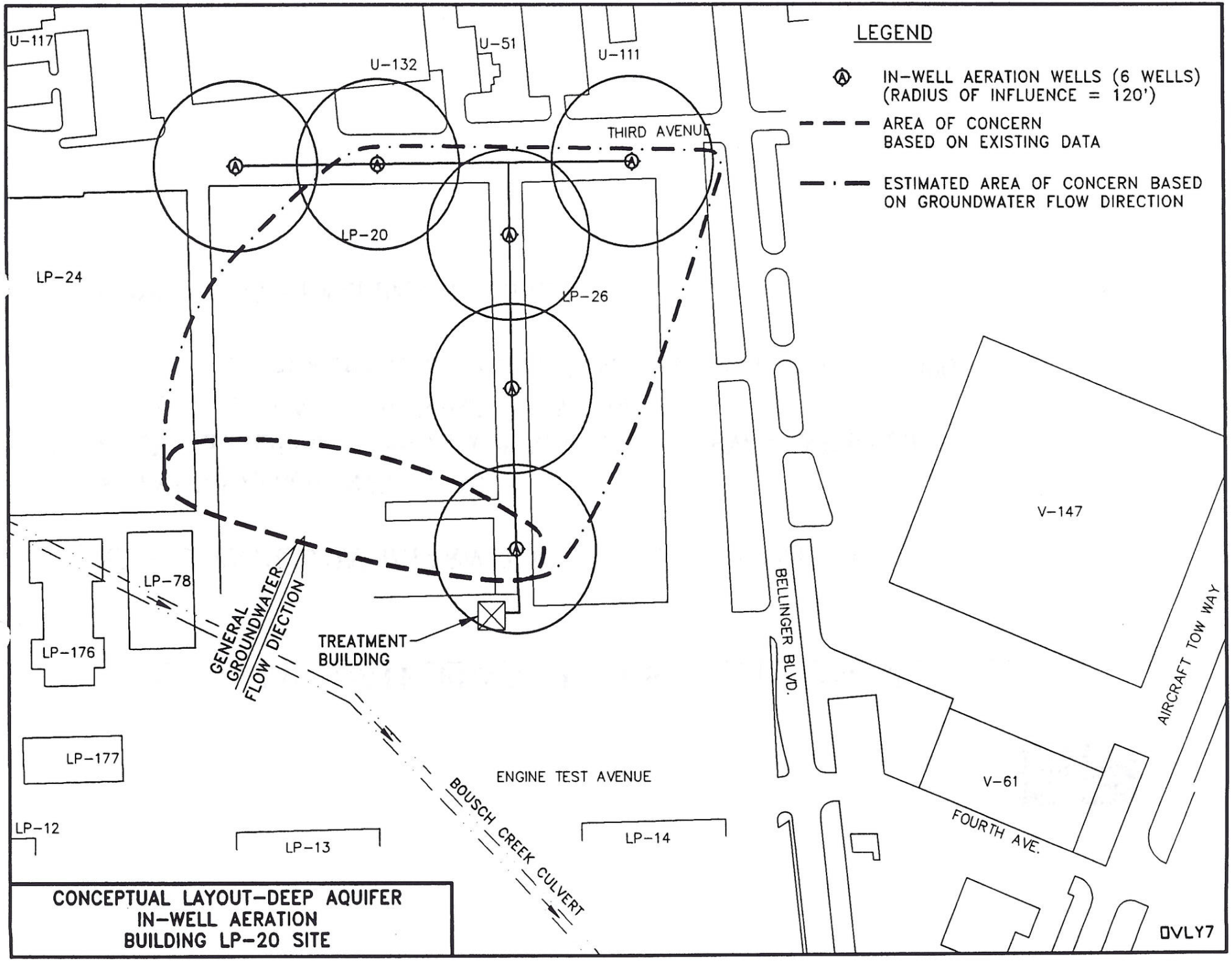
BUILDING LP-20 SITE, FEASIBILITY STUDY (Continued)

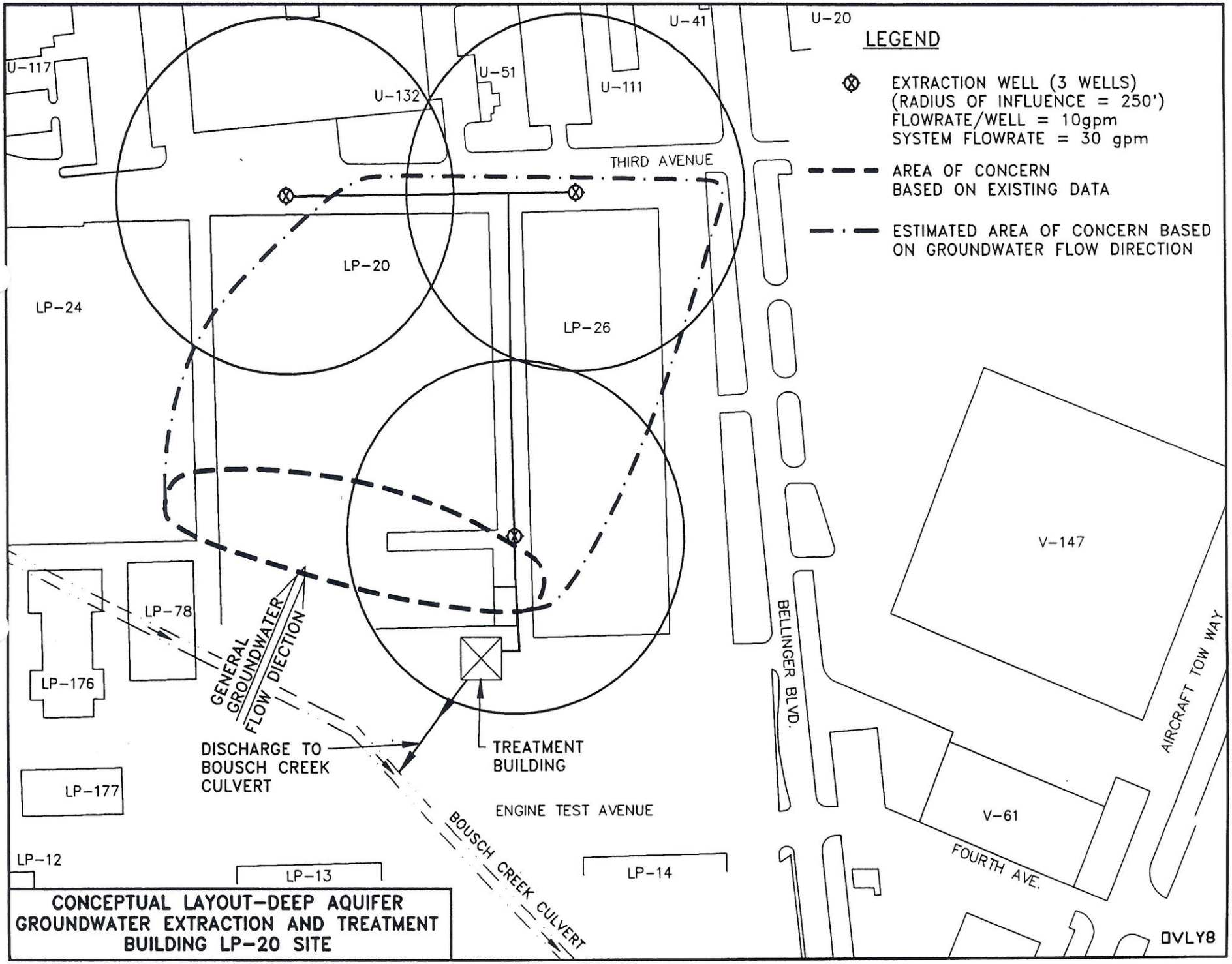
REMEDIAL ACTION ALTERNATIVES - (Yorktown Aquifer)

- 1Y: No Action, NPW = $0
- 2Y: Institutional Controls with Monitoring, NPW = $369,000
- 3Y: In-well Aeration, NPW=$1,571,000
- 4Y: Groundwater Extraction and Treatment, NPW = $2,723,000

NPW = 30-Year Net Present Worth Cost

all same except no air sparge - may worsen interfere


LEGEND
IN-WELL AERATION WELLS (6 WELLS)
(RADIUS OF INFLUENCE = 120')
AREA OF CONCERN
BASED ON EXISTING DATA
ESTIMATED AREA OF CONCERN BASED
ON GROUNDWATER FLOW DIRECTION
U-117
U-132
U-51
U-111
THIRD AVENUE
LP-20
LP-24
LP-26
V-147
LP-78
LP-176
GENERAL GROUNDWATER FLOW DIECTION
TREATMENT BUILDING
BELLINGER BLVD.
AIRCRAFT TOW WAY
LP-177
ENGINE TEST AVENUE
V-61
FOURTH AVE.
LP-12
LP-13
LP-14
BOUSCH CREEK CULVERT
CONCEPTUAL LAYOUT-DEEP AQUIFER
IN-WELL AERATION
BUILDING LP-20 SITE
OVLY7



CONCEPTUAL LAYOUT–DEEP AQUIFER GROUNDWATER EXTRACTION AND TREATMENT BUILDING LP-20 SITE

CAMP ALLEN LANDFILL & Q-AREA DRUM STORAGE YARD Update

Dianne Bailey
Navy Co-Chair

CAMP ALLEN LANDFILL
Remedial Action

- OHM, Corporation is on site, preparing to pour foundation
- Brief for Elementary School, Brig and Marines Feb 96
- Plant start up - 15 Nov 96
- Navy Public Works Center will operate
- RAB Tour Spring/Summer 96

Q-AREA DRUM STORAGE YARD

- ESE still working on Revised RI/FS
- Preliminary data shows no risk due to soil
- Navy personnel removing wood/concrete
- Air Sparging
  - Construction Summer 1996
  - Remediation Summer 1997
- COMNAVBASE plans recreational area

Admin. Issues

- Plasma/ New HW technology mtg was cancelled in Nov, Navy is re-evaluating economic analysis to see if project is feasible. More info later.
- Survey
- Next mtg. - Thurs. March 28th, 1996
- Next tour - April / May
- Review schedule - LP-20 PRAP - ~~Feb March April~~ April 30th — May 30th
  CD PRAP — March 30 — April 30