



Monmouth County Park System

805 NEWMAN SPRINGS ROAD, LINCROFT, NJ 07738
www.monmouthcountyparks.com

Stephanie Weise, QPA
Phone: (732) 842-4000 Ext. 4330
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NOTICE OF RFP Exempt Services

The Monmouth County Park System is soliciting proposals through a Fair and Open process in accordance with the N.J.S.A. 19:44A-20.4 et seq.

Sealed RFP responses will be received by the Purchasing Agent on **Tuesday, September 1, 2015** at **10:00 AM** at the Park System Purchasing Department located at the Monmouth County Park System Headquarters, 805 Newman Springs Road, Lincroft, NJ 07738 at which time and place responses will be opened for:

LICENSED SITE REMEDIATION PROFESSIONAL (LSRP) FOR HISTORIC WALNFORD MAINTENANCE FACILITY (PS #46-15)

Specifications and instructions may be obtained at the Purchasing Office or on the Monmouth County Park System website, www.monmouthcountyparks.com.

Respondents shall comply with the requirements of Affirmative Action P.L. 1975 C127 (N.J.S.A. 17:27 et seq). Statement of Ownership (N.J.S.A. 52:25 – 24.2) is required with your proposal. A copy of your New Jersey Business Registration is preferred with the proposal but mandatory prior to award of contract.

Stephanie Weise, QPA
Purchasing Agent



THE NATION'S FIRST ACCREDITED PARK AND RECREATION AGENCY

Serving the Citizens of Monmouth County Since 1961
RECYCLED PAPER

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1. Introduction

(PS#46-15)

The Monmouth County Park System invites you to submit a proposal for a Licensed Site Remediation Professional (LSRP) for Historic Walnford Maintenance Facility.

2. Administrative Conditions and Requirements

The following items express the administrative conditions and requirements of this RFP. Together with the other RFP sections, they will apply to the RFP process, the subsequent contract, and project production. Any proposed change, modification, or exception to these conditions and requirements may be the basis for the Monmouth County Park System, hereinafter referred to as owners, to determine the proposal as non-responsive to the RFP and will be a factor in the determination of an award of a contract. The contents of the proposal of the successful Respondent, as accepted by the owner, will become part of any contract awarded as a result of this RFP.

2.1. Proposal Submission Information

Proposals must be accompanied by the completed "Proposal Checklist," and must be enclosed in a sealed envelope, bearing the project name and the name of address of the respondent on the outside.

Submission (On or Before) Date and Time:

Tuesday, September 1, 2015 at 10:00 AM

Number of Original Proposals to be submitted: Two (2) Original Proposals with Original Signatures

***Please Note: Fax copies will not be accepted.**

Submission Office:

Stephanie Weise, Purchasing Agent
Monmouth County Park System Headquarters
805 Newman Springs Road
Lincroft, NJ 07738
(732) 842-4000 Ext. 4330
(732) 842-4162

Clearly mark the submittal package with the title of this RFP and the responding firm, addressed to the Purchasing Agent.

Only those RFP responses received prior to or on the submission date will be considered. Responses delivered before the submission date and time specified above may be withdrawn upon written application of the respondent who shall be required to produce evidence showing that the individual is or represents the principal or principals involved in the proposal. After the submission date and time specified above, responses must remain firm for a period of sixty (60) days.

2.2. Using Department Information

Please direct all questions in writing, by mail, e-mail, or fax:

**Monmouth County Park System
Acquisition & Design Department
805 Newman Springs Road
Lincroft, NJ 07738
Attention: James Mowczan
732-842-4000, Ext. 4299
732-842-3640 (Fax)
E-mail: jmowczan@monmouthcountyparks.com**

2.3. Statutory and Other Requirements

2.3.1. Compliance with Laws

Any contract entered into between the vendor and the owner must be in accordance with and subject to compliance by both parties with the New Jersey Local Public Contract Law. The vendor must agree to comply with the non-discrimination provisions and all other laws and regulations applicable to the performance of services there under. The vendor shall sign and acknowledge such forms and certificates as may be required by this section.

2.3.2. Mandatory Affirmative Action Compliance

No firm may be issued a contract unless it complies with the Affirmative Action requirements of P.L. 1975, C. 127 as identified in the document attached.

2.3.3. Americans with Disabilities Act of 1990

Discrimination on the basis of disability in contracting for the delivery of services is prohibited. Vendors are required to read Americans with Disabilities language that is part of the documents attached hereto and agree that the provisions of Title II of the Act are made part of the contract. The vendor is obligated to comply with the Act and hold the owner harmless.

2.3.4. Statement of Ownership

No corporation or partnership shall be awarded any contract for the performance of any work or the furnishing of any goods, unless, with receipt of the proposal of said corporation or partnership, there is submitted a statement setting forth the names and addresses of all stockholders who own ten (10) percent or greater interest therein. The vendor shall complete and submit the form of statement that is included in this RFP.

2.3.5. N.J. Business Registration Certificate

N.J.S.A. 52:32-44 imposes the following requirements on contractors and all subcontractors that knowingly provide goods or perform services for a contractor fulfilling this contract:

NEW JERSEY BUSINESS REGISTRATION REQUIREMENTS NON-CONSTRUCTION

All New Jersey and out of state business organizations must obtain a Business Registration Certificate (BRC) from the Department of Treasury, Division of Revenue, prior to conducting business in the State of New Jersey. Proof of valid business registration with the Division of Revenue, Department of Treasury, State of New Jersey, must be submitted. No contract will be awarded without proof of business registration with the Division of Revenue. The contract will contain provisions in compliance with N.J.S.A. 52:32-44, as amended, outlined below.

The contractor shall provide written notice to its subcontractors and suppliers of the responsibility to submit proof of business registration to the contractor.

Before final payment of the contract is made by the contracting agency, the contractor shall submit an accurate list and proof of business registration of each subcontractor or supplier used in the fulfillment of the contract, or shall attest that no subcontractors were used.

For the term of the contract, the contractor and each of its affiliates and each subcontractor and each of its affiliates (N.J.S.A 52:32-44 (g) (3)) shall collect and remit to the Director, New Jersey Division of Taxation, the use tax due pursuant to the "Sales and Use Tax Act" (N.J.S.A. 54:32 B-1, et seq.) on all sales of tangible personal property delivered into this state.

A business organization that fails to provide a copy of a registration as required pursuant to section 1 of P.L. 2001, c.134 (N.J.S.A. 52:32-44 et seq.) or subsection e. or f. of section 92 of P.L. 1977, c.110 (N.J.S.A. 5:12-92), or that provides false business registration information under the requirements of either of those sections, shall be liable for a penalty of \$25.00 for each day of violation, not to exceed \$50,000.00 for each business registration copy not properly provided under a contract with a contracting agency.

Sample Business Registration Certificates are attached. Certain other forms, such as a Certificate of Authority to collect Sales and Use Taxes or a Certificate of Employee Information Report Approval, are **not** proof of business registration.

Any questions in this regard can be directed to the Division of Revenue at (609) 292-9292. Form NJ-REG can be filed online at: <http://www.state.nj.us/treasury/revenue/gettingregistered.shtml>

**THESE ARE SAMPLES OF THE ONLY ACCEPTABLE
N.J. BUSINESS REGISTRATION CERTIFICATES:**

	STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE
Taxpayer Name:	
Trade Name:	
Address:	
Certificate Number:	
Effective Date:	
Date of Issuance:	
For Office Use Only:	

OR

STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE		DEPARTMENT OF TREASURY DIVISION OF REVENUE PO BOX 352 TRENTON, N.J. 08646-0352
TAXPAYER NAME:	TRADE NAME:	
ADDRESS:	SEQUENCE NUMBER:	
EFFECTIVE DATE:	ISSUANCE DATE:	
 Acting Director New Jersey Division of Revenue		
FORM-BBC(05-01) This Certificate is NOT assignable or transferable. It must be conspicuously displayed at above address.		

2.3.6. Non-Collusion Affidavit

The Non-Collusion Affidavit, which is part of this RFP, shall be properly executed and submitted with the RFP response.

2.3.7. Insurance

For the duration of this agreement, the vendor will procure and maintain insurance, at the vendor's expense, provided by insurance companies authorized to do business in the State of New Jersey, covering all services performed under this Agreement by the Professional or the Professionals subcontractors, as follows:

- (a) General Liability and Property Damage Insurance: The Professional shall maintain General Liability and Property Damage Insurance, in an amount of not less than \$1,000,000.00 combined single limit, covering the Professional and the Professional's subcontractors. The policy shall insure against claims for bodily injury, including accidental death, as well as claims for property damage which may arise from the services rendered under this Agreement, whether performed directly by the Professional or by the Professional's subcontractor or by anyone directly or indirectly employed by either.
- (b) Business/Personal Automobile Coverage: The Professional shall maintain Comprehensive Automobile Liability Insurance, in an amount of not less than \$1,000,000.00 combined single limit, covering all vehicles used by the Professional in furtherance of this contract, prior to commencement of work under this Agreement.
- (c) (For Professional Services Contract only) Professional Liability (Errors & Omissions) Insurance: The Professional shall maintain Professional Liability Insurance in an amount of not less than \$1,000,000.00 combined single limit covering the Professional and the Professional's sub-contractor.
- (d) Workers' Compensation Insurance: The Professional shall maintain Workers' Compensation Insurance in accordance with the Laws of the State of New Jersey.
- (e) **Prior to award the lowest responsible bidder will provide the Park System with a copy of their Certificate of Liability Insurance in the amounts stated in the specifications. Bidder must supply the Certificate of Liability Insurance within five days of notification by the Agency. Failure to provide such Certificate within this time period will be grounds for rejection of bid. The certificate for Public Liability/Property Damage and Business/Personal Automobile coverage must name the County of Monmouth, Monmouth County Board of Recreation Commissioners, and their respective officers, servants and agents as additional insured on all policies except the Worker's Compensation policy.**

2.3.8. Indemnification

The vendor hereby agrees to indemnify and hold harmless the Board of Recreation Commissioners and the County of Monmouth, their agents, servants, and employees from and against all loss, damage, claims, actions, liability and expense, in connection with the loss of life, bodily injury, and/or property damage, if occasioned in whole or in part by any negligent act or omission of the professional or the professional's agent's, servants, employees, and subcontractors limited to services performed under the terms and conditions of this contract. This obligation shall include the provision of a defense for the County of Monmouth and the Board at all stages of the claims or judicial process.

2.3.9. Alternate Dispute Resolution

Non-Binding Mediation: If a dispute between the County and the Contractor arises during the course of the contract, the parties will participate, in good faith, in non-binding mediation.

Either party may demand such mediation by written notice of the other party. The written notice shall contain at least (a) a brief statement of the nature of the dispute, and (b) the name, address and phone number of that party's designated representative for the purposes of mediation. The other party shall designate its representative for mediation in writing no later than five business days after receipt of the demand for mediation. The respective designees shall thereupon, and promptly, with due regard for the need for timely action, choose a mediator. If the parties cannot agree on a mediator, or if they prefer, they shall choose a reputable mediation firm. Any mediation firm so chosen shall present a list of at least five proposed mediators to the parties and shall provide the parties with a summary of each person's qualifications to serve as the mediator. Each party shall rank the proposed mediators in order of preference.

The fifth person on each list will be excluded from further consideration. The chosen mediator shall be the person who is the combined highest-ranking mediator on both preference lists excluding the fifth person on each list. In the event of a tie, the mediator shall be chosen by lot. The parties will not be bound by the Rules of Evidence in presenting the positions before the mediator.

The mediation shall be conducted in such reasonable and efficient manner as may be agreed between the parties and the mediator or, the lack of such an agreement, as may be determined by the mediator.

Each party will bear its own costs of participation in mediation and they will divide the costs of the mediations equally.

If, after a good faith effort to resolve the dispute through mediation, the dispute is not resolved, either party may terminate the mediation by written notice to the mediator and to the other part, whereupon either party may submit the dispute to the Superior Court of New Jersey, Monmouth County, for adjudication, which Court shall have exclusive original jurisdiction over the dispute.

2.4. Addenda

All addenda will be posted on the Monmouth County Park System website (www.monmouthcountyparks.com). It is the responsibility of the vendor to check the website prior to submission of proposal.

2.5. Multiple Proposals Not Accepted

More than one proposal from an individual, a firm or partnership, a corporation or association under the same or different names shall not be considered.

2.6. Failure to Enter Contract

Should the vendor, to whom the contract is awarded, fail to enter into a contract within ten (10) days, Sundays and holidays excepted, the owner may then, at its option, accept the proposal of another vendor.

2.7. Commencement of Work

The vendor agrees to commence work after receipt of a Purchase Order and upon notice from the using department to proceed.

2.8. Termination of Contract

If, through any cause, the vendor shall fail to fulfill in a timely and proper manner obligations under the Contract if the vendor violates any requirements of the Contract, the owner shall thereupon have the right to terminate the Contract by giving written notice to the vendor of such termination at least 30 days prior to the proposed effective date of the termination. Such termination shall relieve the owner of any obligation for the balances to the vendor any sum or sums set forth in the Contract.

The vendor agrees to indemnify and hold the owner harmless from any liability to subcontractors/suppliers concerning payment for work performed or goods supplied arising out of the lawful termination of the Contract by the owner under this provision. In case of default by the vendor, the owner may procure the articles or services from other sources and hold the vendor responsible for any excess cost occasioned thereby.

2.9. Notice of Award

The successful vendor will be notified of the award of contract upon a favorable decision by the governing body. The Purchasing Agent will then send a Purchase Order and Voucher to the vendor.

2.10. Prompt Payment of Construction Contracts P.L. 2006, c. 96 (if applicable)

When the Professional has performed in accordance with the provisions of the contract, and the invoice (bill) including a properly prepared, dated and signed voucher for the work has been approved and certified by the Monmouth County Board of Recreation Commissioners and the Monmouth County Board of Chosen Freeholders, the board shall pay the amount due to the contractor for each payment not more than 30 days after the date received. The invoice shall be deemed approved and certified 20 days after the board receives it unless the board, before the 20 day period, informs the contractor in a written statement of the amount withheld and the amount to be paid, the reason for withholding the payment and how the deficiency can be cured.

Approved (bills) with a properly prepared, dated and signed voucher will be approved for payment by the Board of Recreation Commissioners at the first public meeting after the 20th day. After the board approves payment of invoices (bills) with properly prepared, dated and signed voucher, invoices will be forwarded to the Board of Chosen Freeholders for their approval. All payments will be released in accordance with the attached payment schedule and will be mailed unless other arrangements have been made with our Accounts Payable Department.

In the event that Alternate Dispute Resolution is needed, mediation is the method that shall be used.

2.11. Ownership of Material

The owner shall retain all of its rights and interest in any and all documents and property both hard copy and digital furnished by the owner to the vendor for the purpose of assisting the vendor in the performance of this contract. All such items shall be returned immediately to the owner at the expiration or termination of the contract or completion of any related services, pursuant thereto, whichever comes first. None of the documents and/or property shall, without the written consent of the owner, be disclosed to others or used by the owner or permitted by the owner to be used by their parties at any time except in the performance of the resulting contract. Ownership of all data, materials and documentation originated and prepared for the owner pursuant to this contract shall belong exclusively to the owner. All data, reports, computerized information, programs and materials related to this project shall be delivered to and become the property of the owner upon completion of the project. The vendor shall not have the right to use, sell, or disclose the total of the interim or final work products, or make available to third parties, without the prior written consent of the owner. All information supplied to the owner may be required to be supplied on CD-ROM media compatible with the owner's computer operating system, windows based, Microsoft Office Suite 2000 or MacIntosh System 10.

3. Specifications

(PS#46-15)

PROJECT DESCRIPTION

This project is for the environmental engineering services of a Licensed Site Remediation Professional (LSRP) to assist the Monmouth County Park System in the remediation of two former underground storage tanks found to have discharged a portion of their contents into the surrounding soil and/or groundwater. Both former underground storage tanks were located at the same location. A brief description of the site and the previous undertaken remediation activity/investigation reports are listed below. At the completion of each phase of remediation the Monmouth County Park System, in accordance with fair and open procurement process in compliance with the N.J.S.A. 19:44A-20.4 et seq., advertises for proposals to continue the work. **Excerpts from these previous reports have been electronically scanned and are available on the Park System Purchasing Departments web page, <http://www.monmouthcountyparks.com/page.aspx?ID=2823>**

LOCATION

Walnford Park Maintenance Area, **Building No. 1715** (Block Barn)
91 Walnford Road
Allentown, NJ 08501

The Park System decommissioned and removed one 1,000 gallon gasoline UST and one 1,000 gallon diesel UST adjacent to Walnford Park Maintenance Area Building No. 1715 on December 17, 1993. Both tanks were found to have discharged to the surrounding soil. Remedial work has been performed and multiple analyses all which has been summarized in the following reports:

<u>Date</u>	<u>Title</u>	<u>File Name</u>
June 20, 1995	Site Investigation/Remedial Action Report	426-1715-A.pdf
November 8, 1996	Remedial Action Workplan	426-1715-B.pdf
October 1, 1998	Remedial Action Workplan Addendum	426-1715-C.pdf
June 25, 1999	Remedial Action Workplan Addendum	426-1715-D.pdf
October 5, 2001	Remedial Investigations Report	426-1715-E.pdf
January 24, 2013	Remedial Investigation Summary Letter	426-1715-F.pdf
December 9, 2014	Remedial Investigation Summary Letter	426-1715-G.pdf
June 10, 2015	Remedial Investigation Summary Letter	426-1715-H.pdf

SCOPE OF WORK

The Scope of Work shall include, but not be limited to, the items listed below. It will be the Consultant's responsibility to familiarize themselves with the overall project, review the available information, identify any remedial and investigative analyses/tasks that will be required and base their proposal upon their findings. For comparative purposes in the evaluation the proposals, based upon Park System assessment of the above reports, the tasks described below are what we have interpreted to be representative of the work necessary to complete the next phase of remediation.

1. Install and develop one monitoring well in the interior of the existing maintenance building through the concrete floor slab. Complete and submit all appropriate documentation.
2. Collect groundwater samples from the newly installed well and three adjacent existing wells and laboratory analyze for TCL, VO+TICs and TBA. Two rounds of sampling and testing.
3. Based upon the results develop a remedial strategy and present it to the Park System for consideration.
4. After consultation with the Park System, prepare a Remedial Investigation Report for submission to the NJDEP. If warranted a Response Action Outcome letter will also be issued.

It will be the responsibility of the Consultant to carry out and ensure that all remediation work and testing to complete the clean-up and investigation is performed as outlined in the above referenced work plan. The LSRP will be responsible for overseeing the work of any sub-consultants, laboratories or other parties and for the coordination with Park System operations. The Consultant shall be responsible for final determination of which permits are required for the proposed work and shall be responsible for preparing all documentation and other pertinent data attendant to securing said permits. The Consultant will also be responsible for meeting with all permitting agencies and for incorporating all comments and revisions, which can be reasonably anticipated. Permit fees will be invoiced separately and should not be reflected in the proposal. However, the Consultant will be responsible for reviewing permit fees as needed.

A draft Remedial Action Report and potentially a Remedial Action Outcome shall be submitted to the Park System when the document is approximately 70% complete. The consultant shall be required to attend two meetings with Park System representatives to discuss and resolve any questions or comments regarding submission. The consultant will incorporate all comments on the draft review made by the Park System representatives and mutually agreed upon by the LSRP. The revised Remedial Action Report/Remedial Action Outcome shall be submitted to the NJDEP.

Prior to acceptance of the final report by the Park System, the consultant shall not publish or otherwise publicize any information relating to the project or its findings without written permission from the Park System. Permission will not be unreasonably withheld. Written requests for such permission should include an abstract, or outline in the case of oral presentation. A copy of the initial text of the presentation should also be submitted. The Consultant will refer all inquiries from news organizations to the Park System representative. The Consultant will release no information unless specifically directed by the Park System.

In addition to the above referenced Remedial Investigative Report and the Remedial Action Report/Remedial Action Outcome, at a minimum, the Consultant will be required to make submissions in accordance with the following:

Licensed Site Remediation Professional Retention Form: The Consultant shall prepare for Park System signature the appropriate formwork to inform the NJDEP that they have been retained to serve as the Licensed Remediation Site Professional for this/these project site(s). Upon Park System signature, the Consultant shall submit the executed form to the NJDEP.

Project Schedule And Quality Assurance: The Consultant shall provide a detailed

schedule which indicates time frames required for the activities associated with the remediation services described herein. If applicable, the Consultant shall prioritize the preparation of necessary permit applications and any other approvals. The Consultant shall also develop and submit a quality assurance and quality control plan which is to be used to achieve and sustain a high standard of performance by consultant personnel. The plan shall include quality control organization, employee responsibilities, names and key personnel of all sub-consultants and contractors and specific procedures that are to be followed.

Monthly Progress Reports: Monthly progress reports shall be submitted to the Park System summarizing the progress on the various tasks/subtasks. The reports shall depict the percentage of work finished and the amount of funds expended for each task.

Minutes of Meetings: The consultant is required to attend all meetings with the Park System, local authorities and other agencies as required during the project, to discuss and resolve any questions or comments regarding submissions made to the Park System, or applications made to the various permitting agencies. The Consultant is responsible for documentation of all such meetings and will forward copies of said documentation to the Park System.

CONTENT OF PROPOSAL

In addition to the Monmouth County Park System supplied Proposal Form the respondent shall also submit the following:

TECHNICAL APPROACH: Provide a detailed narrative of the proposed methodology to be employed in the investigation and remediation of the site(s). Include in the narrative the anticipated timeframes to complete the work and possible impact on Park System operations.

THE FIRM'S EXPERIENCE: Discuss and demonstrate the firm's success in directly providing environmental services for projects similar in nature and scope to the project described in this RFP. Identify no more than five (5), no less than three (3) previous projects that the firm has performed which are similar in nature and type to the project described in this RFP. Also attach the resumes of the proposed key personnel who will be assigned to this project detailing their managerial and technical qualifications.

FIRM'S CAPABILITY: Demonstrate the firm's capability to provide the requisite staff, managerial personnel and other resources to meet and satisfactorily perform the scope of work set forth in this RFP. Specifically include a discussion of the firm's current workload and anticipated workload during the term of this contract.

AWARD OF PROPOSAL

The contract will be awarded immediately and include all the investigative work required to prepare a Remedial Investigation Report as described above. The prices listed for the Proposal will be the upset figure and no more will be paid for that item unless it is determined that extra work not covered by the contract has been or is required to be performed and a formal contract amendment has been approved.

PROPOSAL FORMS CHECKLIST (PS # 46-15)

(Owner's checkmarks)		Items submitted with bid (Bidder's INITIALS)
↓	A. FAILURE TO SUBMIT ANY OF THESE ITEMS WITH THE PROPOSAL IS <u>MANDATORY</u> CAUSE FOR REJECTION OF THE PROPOSAL	↓
<u>X</u>	Respondent's Proposal (two copies requested)	_____
<u>X</u>	Statement of Ownership	_____
<u>X</u>	Non-Collusion Affidavit	_____
<u>X</u>	Acknowledgement of Addenda	_____
	B. ITEMS PREFERRED WITH THE PROPOSAL, BUT <u>MANDATORY</u> PRIOR TO AWARD OF CONTRACT	
<u>X</u>	Copy of Respondent's N.J. Business Registration Certificate	_____
<u>X</u>	Copy of subcontractors N.J. Business Registration Certificate	_____
<u>X</u>	EEO/Affirmative Action Compliance Notice	_____
<u>X</u>	Certificate of Employee Information Report	_____
<u>X</u>	Reference/List of previous and/or active relevant work	_____

THE UNDERSIGNED BIDDER HERewith SUBMITS THE ABOVE REQUIRED DOCUMENTS:

PRINT OFFICIAL COMPANY NAME: _____

SIGNED BY: _____

PRINT NAME AND TITLE: _____

DATE: _____

**THIS CHECKLIST SHOULD BE INITIALED AND SIGNED WHERE INDICATED
AND RETURNED WITH ALL DOCUMENTS**

Proposal

RFP #15-43
PS #46-15

Submitted By: _____
(Company Name)

**FOR CONSULTING SERVICES OF A LICENSED SITE REMEDIATION PROFESSIONAL (LSRP)
FOR HISTORIC WALNFORD MAINTENANCE FACILITY (BLDG. #1715).**

TO THE MONMOUTH COUNTY PARK SYSTEM, LINCROFT, NEW JERSEY.

TO THE MONMOUTH COUNTY BOARD OF RECREATION COMMISSIONERS.

The undersigned hereby declares that he/she has carefully examined the Request For Proposal, specifications, and form of contract for furnishing the specified items and that he/she will execute the contract according to the specifications, terms, and conditions with respect to the following:

1. Install and develop one monitoring well in the interior of the existing maintenance building through the concrete floor slab. Complete and submit all appropriate documentation. \$ _____
2. Collect groundwater samples from the newly installed well and three adjacent existing wells and laboratory analyze for TCL, VO+TICs and TBA. Two rounds of sampling and testing. \$ _____
3. Develop a remedial strategy for Park System for consideration. \$ _____
4. Prepare a Remedial Investigation Report for submission to the NJDEP \$ _____

TOTAL COST: \$ _____

VARIANCE IF ANY: _____

The undersigned is a partnership under the laws of the State of _____
an individual a corporation (circle one)

CONSULTANT (Printed): _____

SIGNATURE: _____ DATED: _____

having principal offices at:

ADDRESS: _____

BUSINESS PHONE: _____ FAX NUMBER: _____

E-MAIL: _____ WEB ADDRESS: _____

CONSULTANTS QUALIFICATION AND REFERENCES

The Bidder must supply a minimum of three references. References must be from jobs similar to this project.

References

1.	Contact:	_____
	Company Name:	_____
	Address:	_____
	Phone Number:	_____
	Project:	_____
	Description of Work:	_____

2.	Contact:	_____
	Company Name:	_____
	Address:	_____
	Phone Number:	_____
	Project:	_____
	Description of Work:	_____

3.	Contact:	_____
	Company Name:	_____
	Address:	_____
	Phone Number:	_____
	Project:	_____
	Description of Work:	_____

4.	Contact:	_____
	Company Name:	_____
	Address:	_____
	Phone Number:	_____
	Project:	_____
	Description of Work:	_____

STATEMENT OF OWNERSHIP

(N.J.S.A. 52:25-24.2)

The BIDDER is (check one):

- ☐ Individual ☐ Partnership ☐ P.A. ☐ P.C. ☐ L.L.C. ☐ L.L.P.
- ☐ Corporation ☐ Joint Venture ☐ Other (specify): _____

I certify that:

- ☐ No individual person or entity owns a 10% or greater interest in the Bidder.

OR

- ☐ The names and addresses of all persons and entities who own a 10% or greater interest in the Bidder or any listed entities are as follows:

	NAMES:	ADDRESSES:
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

- ☐ Check here if additional sheets are attached.
- ☐ Check here to certify that no person or entity, **except for those already listed above or on any attached sheets**, owns a 10% or greater interest in the bidder or any listed entities.

NAME OF BIDDER: _____

SIGNED BY: X _____

PRINT NAME & TITLE: _____

DATE: _____

NOTE: If an entity owns a 10% or greater interest in the Bidder, list all owners of 10% or greater interest for each such entity. Repeat the process of disclosure as necessary for each tier or level of ownership until the name and address of each individual person who owns a 10% or greater interest in each listed entity has been disclosed.

NON-COLLUSION AFFIDAVIT

STATE OF _____)
) SS:
COUNTY OF _____)

(type or print affiant's name)

of full age, being first duly sworn according to law on my oath depose and
say that I am a lawful representative of

(type or print name of Bidder)

the Bidder making the Bid for the above cited project, and that I executed the said Bid with full authority to do so; that said Bidder has not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above cited project, and that all statements contained in said Bid and in this affidavit are true and correct, and made with full knowledge that the Monmouth County Board of Recreation Commissioners relies upon the truth of the statements contained in said Bid and in the statements contained in this affidavit in awarding the Contract for the said Project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such Contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the Bidder.

Sworn and Subscribed to
before me this _____ day

of _____ 20 _____ /s/ _____
/s/ _____
(Title)

NOTARY PUBLIC OF _____
(state)

My commission expires _____

EXHIBIT A

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE

N.J.S.A. 10:5-31, et seq. N.J.S.A. (P.L. 1975, C. 127)

N.J.A.C. 17:27

GOODS, PROFESSIONAL SERVICES AND GENERAL SERVICE CONTRACTS

During the performance of this contract, the contractor agrees as follows:

- a. The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.
- b. The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.
- c. The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union of the contractor's commitments under this chapter and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to **N.J.S.A. 10:5-31 et seq.**, as amended and supplemented from time to time and the Americans with Disabilities Act.
- e. The contractor or subcontractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with **N.J.A.C. 17:27-5.2**.

- f. The contractor or subcontractor agrees to inform in writing its appropriate recruitment agencies including, but not limited to, employment agencies, placement bureaus, colleges, universities, and labor unions, that it does not discriminate on the basis of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.
- g. The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job-related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.
- h. In conforming with the targeted employment goals, the contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.
- i. The contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:
- Letter of Federal Affirmative Action Plan Approval
 - Certificate of Employee Information Report
 - Employee Information Report Form AA302 (electronically provided by the Division and distributed to the public agency through the Division's website at www.state.nj.us/treasury/contract_compliance)
- j. The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code at N.J.A.C. 17:27.**

EEO/AFFIRMATIVE ACTION COMPLIANCE NOTICE
N.J.S.A. 10:5-31 and N.J.A.C. 17:27
GOODS, PROFESSIONAL SERVICE AND GENERAL SERVICE CONTRACTS

All successful bidders are required to submit evidence of appropriate affirmative action compliance to the County and Division of Public Contracts Equal Employment Opportunity Compliance. During a review, Division representatives will review the County files to determine whether the affirmative action evidence has been submitted by the vendor/contractor. Specifically, each vendor/contractor shall submit to the Commission, prior to execution of the contract, one of the following documents:

Goods and General Service Vendors

1. Letter of Federal Approval indicating that the vendor is under an existing Federally approved or sanctioned affirmative action program. A copy of the approval letter is to be provided by the vendor to the Commission and the Division. This approval letter is valid for one year from the date of issuance.

Do you have a federally-approved or sanctioned EEO/AA program? Yes ☐ No ☐
If yes, please submit a photostatic copy of such approval.

2. A Certificate of Employee Information Report (hereafter "Certificate"), issued in accordance with N.J.A.C. 17:27-1.1 et seq. The vendor must provide a copy of the Certificate to the Commission as evidence of its compliance with the regulations. The Certificate represents the review and approval of the vendor's Employee Information Report, Form AA-302 by the Division. The period of validity of the Certificate is indicated on its face. Certificates must be renewed prior to their expiration date in order to remain valid.

Do you have a State Certificate of Employee Information Report Approval? Yes ☐ No ☐
If yes, please submit a photostatic copy of such approval.

3. The successful vendor shall complete an Initial Employee Report, Form AA-302 and submit it to the Division with a \$150.00 Fee and forward a copy of the Form to the Commission. Upon submission and review by the Division, this report shall constitute evidence of compliance with the regulations. Prior to execution of the contract, the EEO/AA evidence must be submitted.

The successful vendor may obtain the Affirmative Action Employee Information Report (AA302) on the Division website www.state.nj.us/treasury/contract_compliance.

The successful vendor(s) must submit the AA302 Report to the Division of Public Contracts Equal Employment Opportunity Compliance, with a copy to Public Agency.

The undersigned vendor certifies that he/she is aware of the commitment to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27 and agrees to furnish the required forms of evidence.

The undersigned vendor further understands that his/her bid shall be rejected as non-responsive if said contractor fails to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27.

COMPANY: _____	SIGNATURE: _____
PRINT NAME: _____	TITLE: _____
DATE: _____	

MONMOUTH COUNTY PARK SYSTEM
805 NEWMAN SPRINGS ROAD
LINCROFT, NJ 07738
(732) 842-4000

ACKNOWLEDGMENT OF ADDENDA

BIDDER acknowledges receipt of the following listed Addenda that have been issued for this Project. BIDDER warrants that this Bid fully accounts for all requirements, terms and conditions of these Addenda. (BIDDER must type or print acknowledged Addenda numbers and dates --- OR check the box indicating that NO ADDENDA WERE RECEIVED.

Addendum # _____ Date Received: _____

Addendum # _____ Date Received: _____

Addendum # _____ Date Received: _____

☐ **NO ADDENDA WERE RECEIVED**

ACKNOWLEDGED FOR: _____
(Name of Bidder/Vendor)

Bid #: _____

Signature _____

Name: _____
(Please Print)

Title: _____

Date: _____

PLEASE SUBMIT THIS SHEET WITH YOUR BID PACKET



FRENCH & PARRELLO
ASSOCIATES, P. A.
CONSULTING ENGINEERS
Since 1974

670 NORTH BEERS STREET BLDG. #3
HOLMDEL, NEW JERSEY 07733
(908) 888-7700

VOLUME 1 OF 5

UNDERGROUND STORAGE TANK
SITE INVESTIGATION/REMEDIAL INVESTIGATION REPORT
DRPSR CASE NO. 93-12-17-1452-46/CLOSURE NO. C-92-3694
AND
DRPSR CASE NO. 93-12-17-1205-53/CLOSURE NO. C-92-3695

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Submitted to:

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Responsible Party
Site Remediation
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401 East State Street
Trenton, New Jersey 08625-0029

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Geo-Environmental Services Division

June 20, 1995

FPA No. 92E072ER4

CIVIL ENGINEERING

ENVIRONMENTAL

FIELD SERVICES

GEOTECHNICAL

HYDROGEOLOGY

LABORATORY TESTING

MECHANICAL / ELECTRICAL

STRUCTURAL



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The decommissioning of a 1,000 gallon gasoline underground storage tank and a 1,000 gallon diesel underground storage tank took place on December 17, 1993 at the maintenance yard at Walnford Park, is part of the Monmouth County Park System. The facility's registration number is 0224633 and the closure approval number is C-92-3694 for the gasoline tank and C-92-3695 for the diesel tank. Based upon field observations at the time of UST removal, the Hotline was called and case number 93-12-17-1452-46 was assigned to the gasoline tank and 93-12-17-1205-53 to the diesel tank.

Post excavation sampling results indicated benzene and xylenes to be above the appropriate clean-up standards in the soils at the gasoline tank excavation. Soils around the diesel tank excavation indicated TPHC levels present but below clean-up standards. Additional volatile organic analysis on one of the samples indicated xylenes to be above the Impact to Groundwater Criteria. Groundwater sampling, in the site investigation phase, indicated levels of benzene, ethylbenzene, toluene and xylenes to be above the groundwater cleanup criteria at the gasoline tank location and non-detect with minor amounts of TICS at the diesel tank location. As a result, a remedial investigation was undertaken.

The remedial investigation results in the vicinity of the former gasoline UST location indicates soil contamination of benzene and xylenes at depths of 8.0-8.5 feet to the west of the former UST location adjacent to the building. At depths of 10.0-10.5 feet, benzene contamination was detected just to the west of the excavation. Remedial investigation sampling and analysis in the vicinity of the former diesel UST location indicated no additional contamination present. Remedial investigation groundwater analytical results indicate contaminant levels above



Class II A Groundwater Quality Criteria at the monitoring well installed at the former gasoline UST location and at one hydropunch location. Copies of relevant NJDEP correspondence are included in Appendix A.

The results of the decommissioning of the tank, as well as the site investigation (assessment) and remedial investigation are included in this report, as required. Drawing No. 1 illustrates the Regional Location Plan. Drawing No's. 2, 4 and 4A illustrate the Site Plan and the sampling plan view and cross section view for the site investigation. Drawing No. 3 is the topographic map for the site. Drawing No's. 5, 5A and 6, 6A illustrate the site plan with the site investigation and remedial investigation sample locations and results. Drawing No's. 7, 7A, 8 and 8A illustrate the groundwater analytical results. Drawing No's. 9 and 10 illustrate the groundwater contours. Drawing No. 11 indicates the location of wells from the well searches. The Site Investigation Checklist and Two-Part Certification are included in Appendix B.



2.0 PHYSICAL SETTINGS

2.1 General

The physical setting of the Walnford Park and vicinity is presented in this section. The objective is to detail the physical conditions at the site and surrounding areas. The information presented below was obtained from a site inspection and a review of technical literature and maps on the topography, geomorphology, geology and soils.

2.2 Site Layout

The Walnford Park maintenance area is located off of Walns Mill (Hill) Road in Allentown, Upper Freehold Township, Monmouth County, New Jersey. The site is located west of the road approximately 1500 feet south of the intersection of Walns Mill Road and Polhemustown Road. Drawing No. 1 illustrates the site location. The underground storage tanks were located adjacent to the north side of the maintenance building (Drawing No. 2). The gasoline tank was at the northeast corner and the diesel tank at the northwest corner.

2.3 Site and Regional Geomorphology

The site is located within the Coastal Plain Geomorphic Province of New Jersey. The topography is generally flat with the elevation of approximately 90-95 feet (Drawing No. 3). Topography drops off to the southeast to a small creek. The site is located on the Allentown Quadrangle.



2.4 Land Use

Land use in the area is currently residential and agricultural. Land use maps indicate the site was classified cropland, pasture and deciduous.

2.5 Regional Drainage

Drainage in the vicinity of the site is to the southeast to a small creek and to Crosswicks Creek. This is part of the Delaware River Basin drainage system.

2.6 Site Geology

The site is underlain by Quaternary sands and silts. These overlie the Cretaceous Wenonah Formation. The Wenonah is generally a dark gray, micaceous, quartz silt and fine-grained sand with locally interbedded clay lenses. Sand size becomes coarser towards the top.

2.7 Soils

The soils underlying the site are described as MV-47, AM-24 and AR/Z by the Engineering Soil Survey of New Jersey (Rutgers University Report No. 19, Monmouth County, April of 1955). The MV-47 soils, found in the vicinity of the house, are described as glauconitic, fine, micaceous quartz sand with thin laminae of clay. The AM-24, soils which are found to the west are described as poorly sorted silty sands and sandy silt. In the vicinity of the stream, the soils are classified as AR/Z and are described as a mix of recent alluvium and swampy materials.



Soils observed during the UST decommissioning consisted of dark green, mottled orange clayey silt with varying amounts of coarse-fine sands and gravels. During the installation of the initial monitoring wells, these soils were found to extend to a depth of 18 feet below existing grade. When the additional 4 monitoring wells were installed, the borings primarily encountered dark gray sand and silt.

2.8 Hydrogeology

The Wenonah Formation, in conjunction with the overlying Mt. Laurel Sand in the surrounding areas, is considered a single aquifer. It is relatively uniform in thickness and is about 30-50 feet thick and has a low capacity for transmitting water.

The groundwater level at the site is on the order of 4 to 7 feet below existing grade. Groundwater was not observed during the decommissioning of the two UST's.



3.0 FIELD PROCEDURES AND ANALYTICAL METHODS

3.1 General

This section summarizes the field procedures and analytical methods used by FPA during the Site Investigation and Remedial Investigation phases of work at the site. The scope of work included the removal of a 1,000 gallon unleaded gasoline UST, a 1000 gallon diesel UST and the associated post-excavation, site investigation and remedial investigation sampling.

3.2 Procedures for UST Removal

The removal of the two 1,000 gallon underground storage tanks was performed by Cleaning Up The Environment (C.U.T.E) of Midland Park, New Jersey. Work was performed on December 17, 1993. The work was observed by a NJDEP certified subsurface evaluator from French & Parrello Associates, P.A.

The procedure for the closure was as follows:

1. The tanks were pumped of remaining product;
2. The top of the tanks were exposed by excavation;
3. The sides and one end were excavated;
4. Vapors purged, air monitored;
5. The tanks were removed, staged on plastic and inspected and found to be in poor condition;
6. Piping, which was in the excavation, from the tanks to the pumps were removed as were the pumps;
7. Hole (2'x2') cut in tanks;



8. Tanks cleaned;
9. The sludges and cleaning matter were drummed;
10. The excavation was backfilled with imported clean fill and compacted with bucket of the back-hoe;
11. The tanks were taken to Mazza & Sons, Inc. in Tinton Falls, New Jersey for disposal.

Copies of the decommissioning documentation, provided by C.U.T.E. and a copy of the Standard Reporting Form is included in Appendix C.

3.3 Procedures for Site Investigation

Since there were suspected discharges, soils which were removed, approximately 137 cubic yards from the two excavations, were stockpiled on plastic and covered with plastic. Stockpiled soils were sampled by C.U.T.E. and analyzed. The stockpiled soils were transported to Linden Landfill for disposal. The laboratory results and the manifests are included in Appendix C. Soil water agitation tests were positive from both excavations. Stained soils appeared to go under the building at both excavations. Removal of additional soils at the time would have caused possible damage to the building. Stained soils around the tanks and pumps were observed. HNu readings ranged up to 150 HNu units during excavation of the gasoline UST and ranged from 5 to 15 HNu units during excavation of the diesel UST. The Hotline was called and case number 93-12-17-1452-46 was assigned to the gasoline UST and number 93-12-17-1205-53 to the diesel UST.

3.4 Procedures for Post Excavation Soil Sampling

Post excavation samples were collected on December 17,



1993 by FPA. The samples were kept in refrigerated coolers and transported the next day to Accutest Laboratories of Dayton, New Jersey for analysis. The approved closure plan indicated sampling to be every 5 feet along the centerline of the tank and every 15 feet along the piping plus 2 around the tank biased by field screening. Samples were collected from the bottom of each excavation at a depth of 8.0'-8.5' below grade. A total of 5 samples from each of the excavations were acquired for analysis. No samples were acquired for the piping as it was within the excavation. The location of the samples is shown in Drawing No's. 4 and 4A. Drawing No's. 4 and 4A also illustrate the physical features of each tank and excavation.

3.5 Procedures For Remedial Investigation Soil Sampling

Remedial investigation soil samples were acquired by advancing soil borings with a drill rig on January 30-31, 1995. The test borings were performed by a New Jersey licensed driller from Advanced Environmental Borings under the observation of a representative from FPA.

All borings were completed using hollow stem augers and all soil samples were retrieved using a decontaminated 1 3/8 inch inside diameter split spoon, advanced using ASTM Specification D-1586, the Standard Penetration Test. The split spoon was decontaminated in the following manner:

1. Remove excess soils into the cuttings drum;
2. Thorough washing in detergent (alcanox);



3. Thorough rinsing in potable water, allowing to air dry; and
4. Rinse with distilled, deionized water allowing to air dry.

If all of the visible contaminants had been removed, the spoon was ready for use. If all of the visible contaminants had not been removed, the procedure was repeated with the addition of an acetone rinse, allowed to air dry and a final distilled deionized water rinse. After air drying, the spoon was ready to use.

During the drilling, each split spoon was opened and logged by a representative from FPA. All samples scheduled for analytical testing were placed in laboratory containers, placed in a laboratory provided cooler, and maintained at appropriate temperature until delivery to the laboratory. Full Chain Of Custody documentation was maintained in accordance with NJDEP requirements. All soil sampling procedures were in accordance with the NJDEP Field Sampling Manual, May 1992. The augers and down-hole tools were decontaminated before proceeding to the next location.

For the investigation at the gasoline tank excavation, eight samples were acquired at a depth of 8.0 to 8.5 feet and eight samples at a depth of 10.0 to 10.5 feet. The 8.0 to 8.5 foot sample locations are illustrated on Drawing No. 5 and the 10.0 to 10.5 foot sample locations are illustrated on Drawing No. 5A. For the remedial investigation at the former diesel tank location, three samples were acquired at a depth of 8.0-8.5 feet and three at a depth of 10.0-10.5 feet. The 8.0-8.5 foot samples are illustrated on Drawing No. 6 and the 10-10.5 foot sample locations



are illustrated on Drawing No. 6A. The soil boring logs are included in Appendix D.

3.6 Procedures for Hydropunch Sampling

Hydropunch sampling of groundwater used procedures similar to the borings but the water sample was taken by a decontaminated, dedicated 3/4 inch inside diameter stainless steel/PTFE bailer. The sampling equipment which was attached to the bailer was decontaminated between each hydropunch location. The hydropunch locations are shown on Drawing Number 9.

3.7 Procedures for Site and Remedial Investigation of Groundwater

Since soils with contamination above the Impact to Groundwater Criteria were left in place, a monitoring well was installed in each of the excavations to depths of 17.5 and 18.5 feet in order to sample the groundwater. The wells were installed on May 2, 1994 by a licensed well driller from M & R Soil Investigations of Hammonton, New Jersey. The monitoring well locations are shown on Drawing No. 2. The soil boring logs, well permits, monitoring well installation reports, Form A's and Form B's and field sampling sheets are included in Appendix D. The well permit numbers are 2833885 for the gasoline tank excavation and 2833886 for the diesel tank excavation.

On January 31, 1995 six (6) hydropunch groundwater samples were obtained to assist in determining the probable extent of groundwater contamination. The locations of the six hydropunches are shown on Drawing No. 9. The sampling program was set up with the idea in mind that groundwater flow direction was



towards the south-southeast to the creek. Thus, hydropunch locations 3 through 6 were anticipated to be downgradient of the former UST locations and hydropunch locations 1 and 2 upgradient.

Upon completion of the hydropunch sampling, four additional monitoring wells were installed to attempt to delineate the extent of the groundwater contamination at the site. The wells were installed on March 6 and March 7, 1995. The soil boring logs, well permits, monitoring well installation reports, Form A's and B's and the field sampling sheets are included in Appendix D. The well permit numbers were 2835452 through 2835455.

3.8 Procedures For Sampling of Wells

The wells were purged using 1 1/2" 12 volt submersible pumps. The pump and associated wiring were decontaminated in the FPA offices prior to arriving at the site. Each pump was used for only one well and was then returned to FPA's offices for decontamination. Laboratory grade polyethylene tubing was used for purging. Each length of tubing was used only once. Each well had a minimum of 4 volumes of water removed at rates less than 5 gpm. During purging the pump was lowered through the water column to facilitate a thorough purging of the well. Dissolved oxygen, pH, specific conductance and temperature were taken prior to purging, after purging and after sampling. HNu readings were taken immediately upon opening the well. Water levels were taken prior to and after purging. Sampling was accomplished using either stainless steel and PTFE or PTFE bailers. A PTFE coated stainless steel leader was used to lower the bailer into the water column.

All samples were placed in laboratory supplied containers, placed in laboratory provided coolers and maintained at



appropriate temperatures until delivery to the lab. Field and trip blanks were obtained in accordance with N.J.A.C. 7:26E and the NJDEP Field Sampling Manual, May 1992, as appropriate. Copies of monitoring well installation reports and NJDEP Form A and Form B for each well are presented in Appendix D. Copies of the purge sheets for each FPA sampling event are presented in Appendix D. All monitoring well locations are illustrated on Drawing Numbers 7 through 10.

3.9 Analytical Procedures/Quality Assurance

The analytical procedures and quality assurance are summarized on Table No's. 1 through 5. Analysis of the post-excavation and remedial investigation soil samples for the gasoline UST was for volatile organics plus 15 library search. Analysis of the post-excavation and remedial investigation soil samples for the diesel UST was for TPHC and volatile organics plus 15 library search on one of the samples. During the site investigation of groundwater, analysis of the groundwater samples was for volatile organics plus 15 library search, TBA and MTBE at the gasoline tank excavation and for volatile organics plus 15 library search and base neutrals plus 15 library search at the diesel tank excavation. The hydropunch groundwater samples were analyzed for BTEX. Analysis of the remedial investigation groundwater samples was for volatile organics plus 15 library search, TBA and MTBE.

All sample analyses were performed by Accutest of Dayton, New Jersey, a New Jersey state certified laboratory.



3.10 Procedures For The Execution Of Rising Head
Permeability Tests

On April 19, 1995, a representative from FPA performed rising head tests on three of the six wells at the facility. The wells which had been installed in or immediately adjacent the backfilled UST excavation were not tested as its' permeability may not be representative of the insitu soils. Monitoring well MW-3 could not be tested as the area was infested with bees. The tests were performed as follows:

1. The static water level was recorded, as was the diameter of the well and the screened interval;
2. A 1 3/4 inch outside diameter submersible pump with a check valve at the pump discharge was used to lower the water level;
3. The well was pumped until the discharge stopped and then the pump was turned off;
4. Rebounding water levels were recorded at set time intervals until 90% recovery was achieved;
5. The test procedure was repeated a second time. The data generated was returned to FPA's offices, analyzed and the permeability calculated. The data is presented in Appendix E.



3.11 Procedures for Well Search and Receptor Evaluation

The well search and receptor evaluation investigation was conducted in two phases. The first step was to conduct a well search of available information from the Bureau of Water Allocation, the Monmouth County Department of Health and the Upper Freehold Township Board of Health. The letters of inquiry and the responses are included in Appendix K.

After review of the information received, a representative of French and Parrello Associates, P.A. conducted a field check of the information. At the same time, the area within a one-half mile radius was investigated for the possible presence of any additional private wells and any potential receptors in the down gradient direction of the observed contamination. The field check was conducted on March 23, 1995.



4.0 SUMMARY OF INVESTIGATIVE RESULTS

4.1 General

This section summarizes the investigative results of explorations undertaken at the site, in accordance with the requirements of N.J.A.C. 7:14B, N.J.A.C. 7:26E and the Soil Cleanup Criteria (last revised 2/3/94).

This section includes an overview of the guidelines used for data review, a discussion of the analytical results, a comparison of the analytical results with relevant NJDEP standards.

4.2 Guidelines for Data Review

The results of soil sample analyses detailed in subsequent sections of this report have been evaluated in comparison to the soil quality criteria as proposed in N.J.A.C. 7:26D, last revised February 3, 1994 for all parameters except Lead which was last revised July 18, 1994. These soil criteria were not adopted by the NJDEP but are used as current guidance with the stated revisions.

4.2.1 Application of Soil and Groundwater Standards

The NJDEP Soil Standards currently in use as guidance are categorized into Residential and Non-Residential Direct Contact and Impact to Groundwater Criteria. Direct contact values are generally applied to surface soils within 0.0 to 2.0 feet of grade and Impact to Groundwater values are applied to subsurface soils beyond a depth of 2.0 feet. The NJDEP uses the most stringent of



the Residential, Non-Residential and Impact to Groundwater Criteria. In this case the Impact to Groundwater Criteria standards will be applicable.

The standards for groundwater will be the Class II A Groundwater Quality Criteria.

4.3 Presentation of Analytical Data

Table No's. 6,6A and 7,7A summarize soil analytical results. Table No's. 8, 9 and 10 summarize the groundwater analytical results. Applicable NJDEP soil quality and Groundwater Quality Criteria are indicated on the summary tables to assist in the review of data. In the soils tables, the concentrations of those parameters which exceed the relevant NJDEP criteria are distinguished by shading. Concentrations of groundwater exceeding the Groundwater Quality Criteria are distinguished by an asterisk(*).

4.4 Summary of Soil Analytical Results

The soil analytical results are discussed in this section. A summary of the parameters and methods of analysis are presented on Table No's. 1, 1A and 2, 2A. The analytical results are summarized on Table No's. 6, 6A and 7, 7A and are presented graphically in Drawing No's. 5, 5A and 6, 6A. The laboratory analytical data sheets for the post excavation samples and the remedial investigation samples and associated QA/QC documentation are provided in Appendices F and G.

The results of the post-excavation sampling analyses at the gasoline UST excavation indicated contaminants in several of



the samples to be above the Impact to Groundwater Criteria. These included Xylenes (13-1700 ppm) and benzene (1.2-8.1 ppm). Post-excavation sampling results for the diesel UST excavation indicated TPHC levels to range from <25-5400 ppm. These levels are below the cleanup criteria. Since three of the samples were over 1000 ppm , the highest sample was run for volatile organics plus 15 library search. The results indicated xylenes to be above the impact to groundwater standard at 94 ppm.

The results of the remedial investigation soil sampling in the area around the gasoline UST excavation indicated benzene to be above the Impact to Groundwater Criteria at two locations at 8.0-8.5' and/or 10.0-10.5' depths. It should be noted that the soil samples are below the groundwater table. The benzene levels which were above the Impact to Groundwater Criteria ranged from 1.0-7.4 ppm. Sample WD-14 was taken at a depth of 8.0-8.5' and indicated a benzene level of 7.4 ppm. Sample WD-14A taken at 10.0-10.5', indicated a benzene level of 8.7 ppm. Sample WD-17, at the 8.0-8.5' level, had a benzene concentration of 1.0 ppm. Sample WD-17A however, taken at a depth of 10.0-10.5', indicated only .0073 ppm of benzene, well below the standard.

The results of the remedial investigation of the soils around the area of the diesel tank excavation indicated all results to be less than 25 ppm TPHC.

The results indicate that contamination remains in the soils to depths in excess of 10.5' west of the former gasoline UST location and at 8.0-8.5' west and south of the former UST location. In the area of the former diesel UST location, a localized area of contamination exist at the location of post-excavation sample WD-1.

4.5 Summary of Groundwater Analytical Results

The groundwater analytical results are discussed in this section. A summary of the parameters and methods of analysis are presented on Tables No's. 3 through 5. The analytical results are summarized on Tables No's. 8 through 10 and are presented graphically on Drawing No's. 7 and 8. The laboratory analytical data sheets and associated QA/QC documentation are provided in Appendices H, I and J.

The initial groundwater sampling of the monitoring wells at the former gasoline and diesel UST locations was conducted on May 23, 1994. Depth to groundwater at the time of sampling was 6.30 feet from the top of casing in MW-1-WP (gasoline UST) and 6.48 feet in MW-2-WP (diesel UST). Analysis of the groundwater sample in MW-1-WP was for volatile organics plus 15 library search, TBA and MTBE. The results of the analysis indicated benzene (10000 ppb), toluene (9900 ppb) and xylenes (5600 ppb) to be above clean-up levels in the groundwater. Analysis of the groundwater sample for MW-2-WP was for volatile organics plus 15 library search and base neutrals plus 15 library search. The results of the analysis indicated all targeted parameters to be non-detect with minor amounts of TIC'S detected. The laboratory results are included in Appendix H. One trip blank was acquired on July 11 for the sampling at three separate park facilities. The trip blank is reported with the Turkey Swamp Park data but did not get reported with these data. A copy is included at the back of Appendix H.

Since the contaminant levels were above the groundwater cleanup criteria, two additional rounds of sampling were conducted. Samples were collected on June 15, 1994 and July 11, 1994. Depths to groundwater at MW-1-WP at the times of the samplings were 7.92



and 8.56 feet from the top of the casing respectively. The depths to groundwater at MW-2-WP were 7.82 and 7.97 feet from the top of casing. The tabulated analytical results are summarized in Tables 8 and 8A along with the averages of the three sampling events. The results of the last two sampling events at MW-1-WP indicated a decrease at first followed by an increase with the averages for benzene, toluene, and xylenes above clean-up standards. Total TICS showed a progressive decrease and was non-detect in the last sampling. The results at MW-2-WP remained non-detect for all targeted parameters. Laboratory results are included in Appendix H.

Prior to the installation of the monitoring wells for the remedial investigation of the groundwater, six hydropunch groundwater samples were collected and analyzed in an attempt to facilitate locating the monitoring wells. The results of the hydropunch sampling indicated elevated levels of benzene (38.0 ug/L) at HP-5WD. Ethylbenzene, toluene and xylenes were below the clean-up standard. A sample of the groundwater was also analyzed from MW-1 (MW-1WD) which showed benzene at 18000 ug/L, ethylbenzene at 890 ug/L, toluene at 12000 ug/L and xylenes at 5900 ug/L. The analytical results are included on Table Number 9 and are included in Appendix I.

The remedial investigation of the groundwater at the site consisted of the sampling of five monitoring wells at the site on two separate occasions. The first sampling event was conducted on March 28, 1995. Since groundwater contamination was related to the gasoline UST, the samples were analyzed for volatile organics plus 15, TBA and MTBE. A field blank and a trip blank were also analyzed. The results of the analyses indicated that only MW-1 had contaminant levels above the clean-up standards. The results



indicated benzene levels of 9900 ug/L, ethylbenzene levels of 790 ug/L, toluene levels of 8700 ug/L and xylene levels of 4000 ug/L. TBA was non-detect and MTBE was 10000 ug/L. Monitoring wells MW-2, MW-3, MW-4, MW-5 and MW-6 were non-detect for the targeted parameters. The results are summarized on Drawing No. 7 and Table No. 10 and are included in Appendix J.

The second round of groundwater sampling for the remedial investigation was conducted on April 17, 1995. The results of the analysis indicated groundwater contamination to be detected in Monitoring Well MW-1 and non-detect in all the other wells. The analytical results indicated 11000 ug/L of benzene, 8900 ug/L of toluene, and 3700 ug/L of xylenes to be above the cleanup standard. Total TIC'S were found to be 2690 ug/L. MTBE was found to be present at 9200 ug/L. The results of the second round of sampling showed an increase in the levels of benzene, toluene and total TIC'S. A decrease was noted in ethylbenzene, xylenes and MTBE. The results are summarized on Drawing No. 10 and Table No. 10 and are included in Appendix J.

Groundwater contours for the two sampling events are illustrated on Drawing No's. 9 and 10. Monitoring well data and the groundwater elevation data are summarized on Table No. 11. The Contour Map Reporting Form is included in Appendix B. The groundwater contour maps show the groundwater flow direction to be to the southwest towards Pine Brook Road. Based upon the groundwater flow direction observed and the results of the analytical groundwater testing, any groundwater contamination moving away from the former UST location would be moving to the south-southeast towards monitoring well MW-5.



4.6 Summary of Rising Head Permeability Tests

The results of the rising head permeability tests are summarized in Table No. 12. Monitoring wells MW-1 and MW-2 were not tested as they were within the excavation area and would not be representative of the permeability of the natural in-situ soils. Monitoring well MW-3, which is an upgradient well, could not be tested as the area was infested with bees. The results of the tests indicate the permeabilities in the soils to range from 2.46×10^{-5} cm/sec at MW-5 to 8.68×10^{-5} cm/sec at MW-4. These permeabilities are slow and are representative of soils classified as silts.

Groundwater flow characteristics at the site were determined using groundwater levels and the permeability data discussed above. The average hydraulic gradient at the site was calculated to be 2.2%, in a southerly direction. Utilizing an effective porosity of 0.2 and 0.4 yields groundwater velocities of 0.02 and 0.01 ft./day, respectively.

4.7 Summary of Well Search and Receptor Evaluation

The well search results are summarized in Table No. 13 and are located on the quadrangle map included as Drawing No. 11. The results of the well search indicate no (0) public supply wells within a one-mile radius of the site. These wells are at locations ranging from 3696 feet to 4752 feet from the site. Six monitoring wells were installed for this investigation. One additional well was identified at the site but its physical characteristics are unknown. The well is a domestic well and is located off the northeast corner of the house. This well is not in the downgradient direction. Two (2) wells, listed as domestic, exist up



gradient to the northwest of the site (No's. 12 and 13 on Table 13). Five (5) wells were listed as having an unknown use in the surrounding area. Four of the wells, No's. 1 through 4 are upgradient of the site. The fifth, Number 5, lies some 2112 feet south-southwest of the site is across Crosswicks Creek.

The field search for any potential receptors was conducted on March 23, 1995. The only potential surface receptor observed was the small tributary to Crosswicks Creek which is located in the southern portion of the property. The house has a basement. Investigation of the basement indicated that it had not been impacted as no gasoline odors were apparent and HNu readings were background. The other buildings on the property did not have basements. Underground utilities were not identified. No stressed vegetation was observed.



5.0 SUMMARY OF CONCLUSIONS

The site investigation conducted during the decommissioning of the 1000 gallon unleaded gasoline underground storage tank and the 1000 gallon diesel underground storage tank and the remedial investigation at the site indicated evidence of discharges. Post-excavation and remedial investigation sampling indicated elevated levels of Benzene and Xylenes in the in-situ soils at the former gasoline UST location and xylenes at one location at the former diesel UST location. Groundwater analytical results indicated there was impact to groundwater above the appropriate standard for Benzene, Ethylbenzene, Toluene and Xylenes in the immediate area of the former gasoline UST. However, the extent of soil and groundwater contamination has not yet been defined.

The relatively slow groundwater velocity combined with the apparent lack of receptors in the immediate down gradient direction leads us to conclude that the site is a candidate for natural remediation, subject to complete definition of the extent of contamination and further investigation of the site characteristics to a natural remediation approach.

TABLE No. 1
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
GASOLINE UNDERGROUND STORAGE TANK
POST EXCAVATION SOIL SAMPLING

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
VO+15 (8240)	Soil	4	0	0	4°C	2-2 oz.(glass)	14 Days
LEAD (7420)	Soil	0	0	0	4°C	1-300 ml.(glass)	180 Days
VO+15 (624)	Water	0	1	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
TBA, MTBE (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
LEAD (239.2)	Water	0	0	0	4°C, HNO ₃	1-1 L.(plastic)	180 Days
BTEX (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days

TABLE No. 1A
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
No. 2 FUEL OIL/DIESEL FUEL UNDERGROUND STORAGE TANK
POST EXCAVATION SOIL SAMPLING

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
TPHC (418.1 MOD)	Soil	5	0	0	4°C	1-300 ml.(glass)	28 Days
VO+15 * (8240)	Soil	1	1	0	4°C	2-2 oz.(glass)	14 Days
VO+15 (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
BN+15 (625)	Water	0	0	0	4°C	2-1 L.(glass)	Extract - 7 Days Analysis - 40 Days

* - Run on 25% of samples which exceed 1,000 PPM TPHC.

TABLE No.2
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
GASOLINE UNDERGROUND STORAGE TANK
REMEDIAL INVESTIGATION SOIL SAMPLING

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
VO+15 (8240)	Soil	16	0	0	4°C	2-2 oz.(glass)	14 Days
LEAD (7420)	Soil	0	0	0	4°C	1-300 ml.(glass)	180 Days
VO+15 (624)	Water	0	2	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
TBA, MTBE (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
LEAD (239.2)	Water	0	0	0	4°C, HNO ₃	1-1 L.(plastic)	180 Days
BTEX (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days

TABLE No. 2A
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
No. 2 FUEL OIL/DIESEL FUEL UNDERGROUND STORAGE TANK
REMEDIAL INVESTIGATION SOIL SAMPLING

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
TPHC (418.1 MOD)	Soil	6	0	0	4°C	1-300 ml.(glass)	28 Days
VO+15 * (8240)	Soil	0	0	0	4°C	2-2 oz.(glass)	14 Days
VO+15 (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
BN+15 (625)	Water	0	0	0	4°C	2-1 L.(glass)	Extract - 7 Days Analysis - 40 Days

* - Run on 25% of samples which exceed 1,000 PPM TPHC.

TABLE No. 3
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
GASOLINE UNDERGROUND STORAGE TANK
GROUNDWATER SAMPLING (MONITORING WELL) SITE INVESTIGATION

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
VO+15 (8240)	Soil	0	0	0	4°C	2-2 oz.(glass)	14 Days
LEAD (7420)	Soil	0	0	0	4°C	1-300 ml.(glass)	180 Days
VO+15 (624)	Water	3	3	3	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
TBA, MTBE (624)	Water	3	3	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
LEAD (239.2)	Water	0	0	0	4°C, HNO ₃	1-1 L.(plastic)	180 Days
BTEX (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days

TABLE No. 3A
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
No. 2 FUEL OIL/DIESEL FUEL UNDERGROUND STORAGE TANK
GROUNDWATER SAMPLING (MONITORING WELLS) SITE INVESTIGATION

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
TPHC (418.1 MOD)	Soil	0	0	0	4°C	1-300 ml.(glass)	28 Days
VO+15 * (8240)	Soil	0	0	0	4°C	2-2 oz.(glass)	14 Days
VO+15 (624)	Water	3	3	3	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
BN+15 (625)	Water	3	3	0	4°C	2-1 L.(glass)	Extract - 7 Days Analysis - 40 Days

* - Run on 25% of samples which exceed 1,000 PPM TPHC.

TABLE No. 4
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
GASOLINE UNDERGROUND STORAGE TANK
GROUNDWATER SAMPLING (HYDROPUNCH) REMEDIAL INVESTIGATION

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
VO+15 (8240)	Soil	0	0	0	4°C	2-2 oz.(glass)	14 Days
LEAD (7420)	Soil	0	0	0	4°C	1-300 ml.(glass)	180 Days
VO+15 (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
TBA, MTBE (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
LEAD (239.2)	Water	0	0	0	4°C, HNO ₃	1-1 L.(plastic)	180 Days
BTEX (624)	Water	7	1	1	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days

TABLE No. 5
WALNFORD PARK

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
GASOLINE UNDERGROUND STORAGE TANK
GROUNDWATER SAMPLING (MONITORING WELLS) REMEDIAL INVESTIGATION

PARAMETER (METHOD)	MATRIX	NUMBER OF SAMPLES	NUMBER OF FIELD BLANKS	NUMBER OF TRIP BLANKS	PRESERVATIVE	CONTAINER VOLUME (TYPE)	SAMPLE HOLDING TIME
VO+15 (8240)	Soil	0	0	0	4°C	2-2 oz.(glass)	14 Days
LEAD (7420)	Soil	0	0	0	4°C	1-300 ml.(glass)	180 Days
VO+15 (624)	Water	12	2	2	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
TBA, MTBE (624)	Water	12	2	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days
LEAD (239.2)	Water	0	0	0	4°C, HNO ₃	1-1 L.(plastic)	180 Days
BTEX (624)	Water	0	0	0	4°C 4°C, HCL	3-40 ml.(glass)	7 Days 14 Days

TABLE No. 6
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLING-GASOLINE UST

PARAMETER				BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS
RESIDENTIAL STANDARD				3	1000	1000	410	
NON-RESIDENTIAL STANDARD				13	1000	1000	1000	
IMPACT TO GROUNDWATER STANDARD				1	100	500	10	
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE					
WG-1	E335537	8.0-8.5'	12-17-93	8.1	69.0	120.0	290.0	5746.0
WG-2	E335538	8.0-8.5'	12-17-93	0.4	3.0	3.8	13.0	63.7
WG-3	E335539	8.0-8.5'	12-17-93	4.8	40.0	150.0	230.0	127.4
WG-4	E335540	8.0-8.5'	12-17-93	1.2	76.0	150.0	1700.0	939.5
WG-5	E335541	8.0-8.5'	12-17-93	1.7	42.0	130.0	280.0	101.8
WG-FB	E335536	N/A	12-17-93	ND	ND	ND	ND	

KEY: 1. All units in PPM
 2. ND = Non-Detect
 3. Shaded Area = Above Standard

TABLE No. 6A
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLING-DIESEL UST

PARAMETER				BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS	TPHC
RESIDENTIAL STANDARD				3	1000	1000	410	--	10000
NON-RESIDENTIAL STANDARD				13	1000	1000	1000	--	--
IMPACT TO GROUNDWATER STANDARD				1	100	500	10	--	--
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE						
WD-1	E335531	8.0-8.5'	12-17-93	0.10	7.70	2.80	94.0	117.4	5400
WD-2	E335532	8.0-8.5'	12-17-93	NT	NT	NT	NT	NT	1400
WD-3	E335533	8.0-8.5'	12-17-93	NT	NT	NT	NT	NT	2500
WD-4	E335534	8.0-8.5'	12-17-93	NT	NT	NT	NT	NT	800
WD-6	E335535	8.0-8.5'	12-17-93	NT	NT	NT	NT	NT	<25
WD-FB	E335536	N/A	12-17-93	ND	ND	ND	ND	ND	NT

KEY: 1. All units in PPM
 2. ND = Non-Detect
 3. Shaded Area = Above Standard
 4. NT = Not tested

TABLE No. 7
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST

PARAMETER				BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD				3	1000	1000	410
NON-RESIDENTIAL STANDARD				13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD				1	100	500	10
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE				
WD-10	E855-7	8.0-8.5'	1-30-95	ND	ND	ND	.0048
WD-10A	E855-8	10-10.5'	1-30-95	ND	ND	ND	.0038
WD-11	E855-9	8.0-8.5'	1-30-95	ND	ND	ND	.0032
WD-11A	E855-10	10-10.5'	1-30-95	ND	ND	ND	ND
WD-12	E855-11	8.0-8.5'	1-30-95	ND	ND	ND	.0022
WD-12A	E855-12	10-10.5'	1-30-95	ND	ND	ND	ND
WD-13	E855-13	8.0-8.5'	1-30-95	0.45	0.25	1.5	2.2

TABLE No. 7 (Cont.)**WALNFORD PARK****TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST**

PARAMETER				BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD				3	1000	1000	410
NON-RESIDENTIAL STANDARD				13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD				1	100	500	10
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE				
WD-13A	E855-14	10-10.5'	1-30-95	0.38	.0047	.014	.025
WD-14	E889-1	8.0-8.5'	1-31-95	7.4	0.34	4.3	1.7
WD-14A	E889-2	10-10.5'	1-31-95	8.7	0.59	14.0	3.0
WD-15	E889-3	8.0-8.5'	1-31-95	0.21	.0061	0.033	0.032
WD-15A	E889-4	10-10.5'	1-31-95	0.026	.0051	0.023	0.030
WD-16	E889-5	8.0-8.5'	1-31-95	0.51	0.98	4.8	6.7
WD-16A	E889-6	10-10.5'	1-31-95	0.12	.0081	0.041	0.062

TABLE No. 7 (Cont.)
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST

PARAMETER				BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD				3	1000	1000	410
NON-RESIDENTIAL STANDARD				13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD				1	100	500	10
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE				
WD-17	E889-7	8.0-8.5'	1-31-95	1.0	.0048	0.038	0.024
WD-17A	E889-8	10-10.5'	1-31-95	.0073	ND	.0041	0.012
FIELD BLANK	E855-15	N/A	1-30-95	ND	ND	ND	ND
FIELD BLANK	E899-16	N/A	1-31-95	ND	ND	ND	ND

KEY: (1) All units are ppm
 (2) WD-10 - Field Number
 E855-7 - Lab Number
 (3) Shaded = Above Standard

TABLE No. 7A
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-DIESEL UST

PARAMETER				TPHC
RESIDENTIAL STANDARD				10000
NON-RESIDENTIAL STANDARD				--
IMPACT TO GROUNDWATER STANDARD				--
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE	
WD-7	E855-1	8.0-8.5'	1-30-95	<25
WD-7A	E855-2	10-10.5'	1-30-95	<25
WD-8	E855-3	8.0-8.5'	1-30-95	<25
WD-8A	E855-4	10-10.5'	1-30-95	<25
WD-9	E855-5	8.0-8.5'	1-30-95	<25
WD-9A	E855-6	10-10.5'	1-30-95	<25

KEY: 1. All units in PPM

TABLE No. 8
WALNFORD PARK
TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (MONITOR WELL) SITE INVESTIGATION
GASOLINE UST

DATE OF SAMPLE		5-23-94	6-15-94	7-11-94	AVERAGE
FPA SAMPLE NUMBER		MW-1	MW-1	MW-1	--
LAB SAMPLE NUMBER		E415024	E418665	E422195	--
PARAMETER	STANDARD				
BENZENE	1.0	10000	12000	23000	15000
ETHYLBENZENE	700	530	310	1100	647
TOLUENE	1000	9900	7800	20000	12567
XYLENES	40	5600	2500	7100	4317
TOTAL TICS		5300	2000	0	--
MTBE		33000	41000	57000	43667
TBA		ND	ND	ND	--

KEY: (1) All units in PPB
(2) ND = Non detect
(3) Shaded = Above Standard

TABLE No. 8A
WALNFORD PARK
TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (MONITOR WELL) SITE INVESTIGATION
DIESEL UST

DATE OF SAMPLE		5-23-94	6-15-94	7-11-94	AVERAGE
FPA SAMPLE NUMBER		MW-2	MW-2	MW-2	--
LAB SAMPLE NUMBER		E415025	E418666	E422196	--
PARAMETER	STANDARD				
VOLATILE ORGANICS	--	ND	ND	ND	ND
TOTAL VO TICS	--	5	36	9	16.7
BASE NEUTRALS	--	ND	ND	ND	ND
TOTAL BN TICS	--	7	ND	ND	2.3

KEY: (1) All units in PPB
(2) ND = Non detect
(3) Shaded = Above Standard

TABLE No. 9
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (HYDROPUNCH) REMEDIAL INVESTIGATION

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
STANDARD			1.0	700	1000	40
FPA SAMPLE NUMBER	LAB SAMPLE NUMBER	DATE OF SAMPLE				
HP-1WD	E899-9	1-31-95	ND	1.3	4.6	4.6
HP-2WD	E899-10	1-31-95	ND	ND	ND	ND
HP-3WD	E899-11	1-31-95	ND	ND	ND	ND
HP-4WD	E899-12	1-31-95	ND	ND	2.7	ND
HP-5WD	E899-13	1-31-95	38	ND	ND	2.7
HP-6WD	E899-14	1-31-95	ND	ND	ND	ND
MW-1WD	E899-15	1-31-95	18000	890	12000	5900
FIELD BLANK	E899-16	1-31-95	ND	ND	ND	ND
TRIP BLANK	E899-17	1-31-95	ND	ND	ND	ND

KEY: (1) ND = Not detected
 (2) All values in ug/L
 (3) Shaded = Above Standard

TABLE No. 10
WALNFORD PARK

GROUNDWATER SAMPLING (MONITOR WELLS) REMEDIAL INVESTIGATION

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS	MTBE	TBA
STANDARD			1.0	700	1000	40			
WELL	DATE	LAB SAMPLE NUMBER							
MW-1	3-28-95 4-17-95	E2338-1 E2876-1	9900 * 11000 *	790 * 600	8700 * 8900 *	4000 * 3700 *	1200 2690	10000 9200	ND ND
MW-2	3-28-95 4-17-95	E2338-2 NT	ND NT	ND NT	ND NT	ND NT	ND NT	ND NT	ND NT
MW-3	3-28-95 4-17-95	E2338-3 E2876-2	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-4	3-28-95 4-17-95	E2338-4 E2876-3	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-5	3-28-95 4-17-95	E2338-5 E2876-4	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-6	3-28-95 4-17-95	E2338-6 E2876-5	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
FIELD BLANK	3-28-95 4-17-95	E2338-7 E2876-6	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
TRIP BLANK	3-28-95 4-17-95	E2338-8 E2876-7	ND ND	ND ND	ND ND	ND ND	ND ND	NT NT	NT NT

KEY: NT = Not Tested
 ND = Not Detected
 * = Above Standard
 All units in ug/L

TABLE No. 11
WALNFORD PARK

SUMMARY OF MONITORING WELL
AND
GROUNDWATER ELEVATION DATA

WELL NUMBER	PERMIT NUMBER	TOP OF PVC CASING ELEVATION(FEET-MSL)	TOP OF WELL SCREEN ELEVATION(FEET-MSL)	3-28-95	4-17-95
MW-1	2833885	96.33	91.31	89.31	89.52
MW-2	2833886	96.03	91.25	88.61	88.93
MW-3	2835452	93.37	91.07	88.45	88.87
MW-4	2835453	91.27	89.08	87.45	87.48
MW-5	2835454	92.83	86.99	85.91	85.23
MW-6	2835455	96.25	93.75	89.53	89.52

KEY:

MSL - Mean Sea Level

TABLE No. 12
WALNFORD PARK

PERMEABILITY TEST RESULTS

WELL NUMBER	PERMIT NUMBER	TYPE OF PERMEABILITY TEST CONDUCTED	RECOMMENDED HYDRAULIC CONDUCTIVITY (cm/sec)
MW-1	2833885	RISING HEAD PERMEABILITY TEST	NT
MW-2	2833886	RISING HEAD PERMEABILITY TEST	NT
MW-3	2835452	RISING HEAD PERMEABILITY TEST	NT
MW-4	2835453	RISING HEAD PERMEABILITY TEST	8.68E-05
MW-5	2835454	RISING HEAD PERMEABILITY TEST	2.46E-05
MW-6	2835455	RISING HEAD PERMEABILITY TEST	3.93E-05

KEY:

- (1) See data calculations in Appendix
- (2) See Drawing No. for locations
- (3) cm/sec = centimeters per second
- (4) NT = Not tested

TABLE No. 13

WALNFORD PARK
WELL SEARCH REPORT FORM

WELL OWNER	DISTANCE FROM SITE (FEET)	DEPTH OF WELL (FEET)	INTERVAL SCREENED (FEET)	USE	PUMPING RATE (GAL/MIN)	SAMPLING RESULTS
(1) Collins, Ed Jr.	4752 (NE)	POND	UNK	UNK	UNK	N/A
(2) Pleasant Run Farm	4224 (E)	20	UNK	UNK	UNK	N/A
(3) Collins, Ed Jr.	2640 (NNW)	305	UNK	UNK	450	N/A
(4) Princeton Nurseries, Inc.	3168 (W)	STREAM	UNK	UNK	UNK	N/A
(5) Dey, S. P. III/ Heritage Hill Farm	2112 (SSW)	STREAM	UNK	UNK	750	N/A
(6) Monmouth County Park System	SITE (MW-1)	18.5	3.5-18.5	M	N/A	SEE REPORT
(7) Monmouth County Park System	SITE (MW-2)	17.5	2.5-17.5	M	N/A	SEE REPORT
(8) Monmouth County Park System	SITE (MW-3)	15	2.5-15	M	N/A	SEE REPORT
(9) Monmouth County Park System	SITE (MW-4)	15	2.5-15	M	N/A	SEE REPORT
(10) Monmouth County Park System	SITE (MW-5)	21	6-21	M	N/A	SEE REPORT

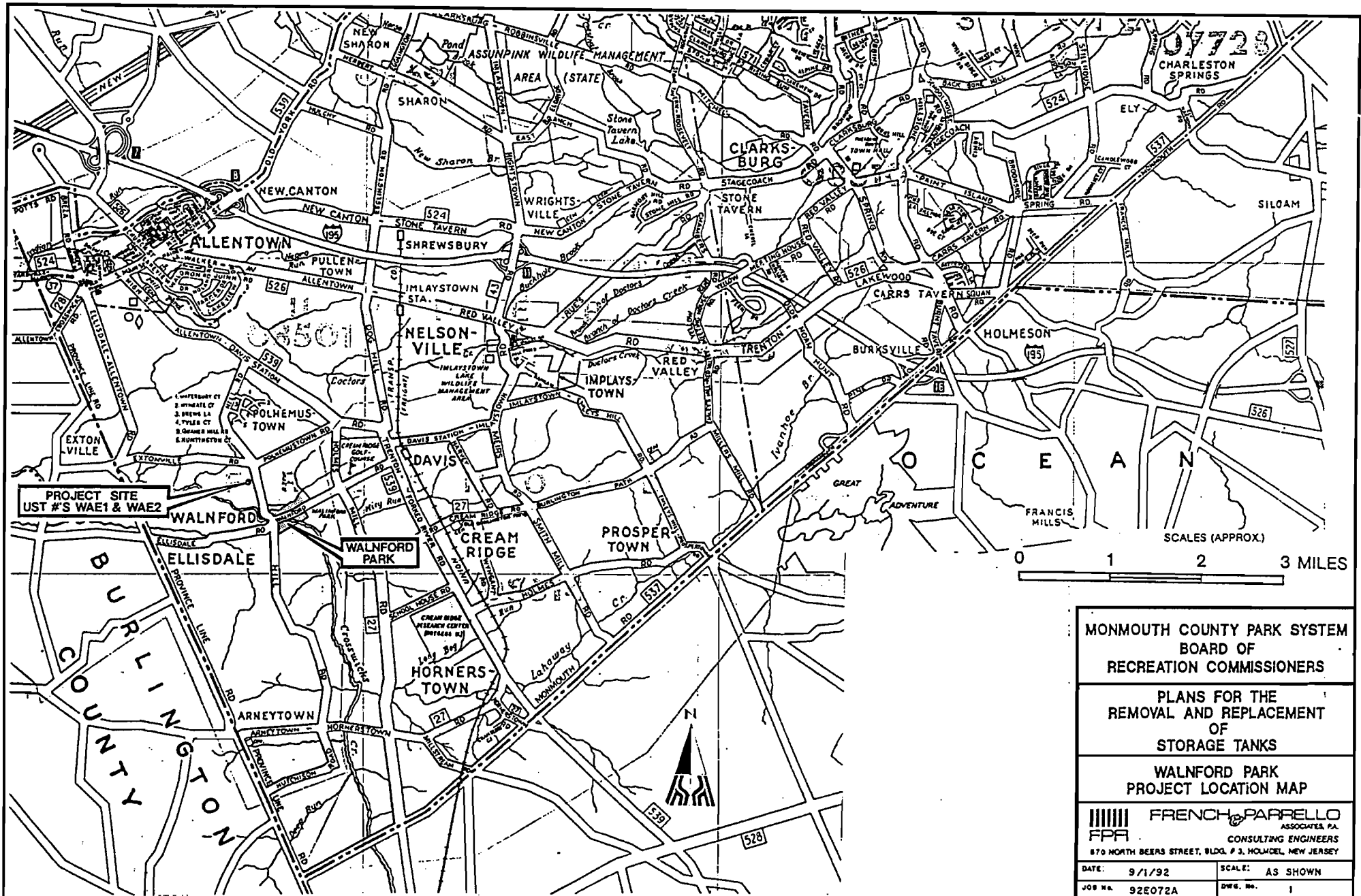
KEY: (1) USE: D = Domestic P = Public Supply (Potable) I = Industrial
 F = Irrigation M = Monitoring
 (2) See Dwg. No. 11 for locations

TABLE No. 13A
(Continued)

WALNFORD PARK
WELL SEARCH REPORT FORM

WELL OWNER	DISTANCE FROM SITE (FEET)	DEPTH OF WELL (FEET)	INTERVAL SCREENED (FEET)	USE	PUMPING RATE (GAL/MIN)	SAMPLING RESULTS
(11) Monmouth County Park System	SITE (MW-6)	15	2.5-15	M	N/A	SEE REPORT
(12) Margery B. Lesnak	1000 (NW)	94	89-94	D	12	N/A
(13) V.A.F. Associates	1900 (NW)	93	88-93	D	12	N/A
(14) Monmouth County Park System	SITE	UNK	UNK	D	UNK	N/A
(15)						
(16)						
(17)						
(18)						
(19)						
(20)						

KEY: (1) USE: D = Domestic P = Public Supply (Potable) I = Industrial
 F = Irrigation M = Monitoring
 (2) See Dwg. No. 11 for locations



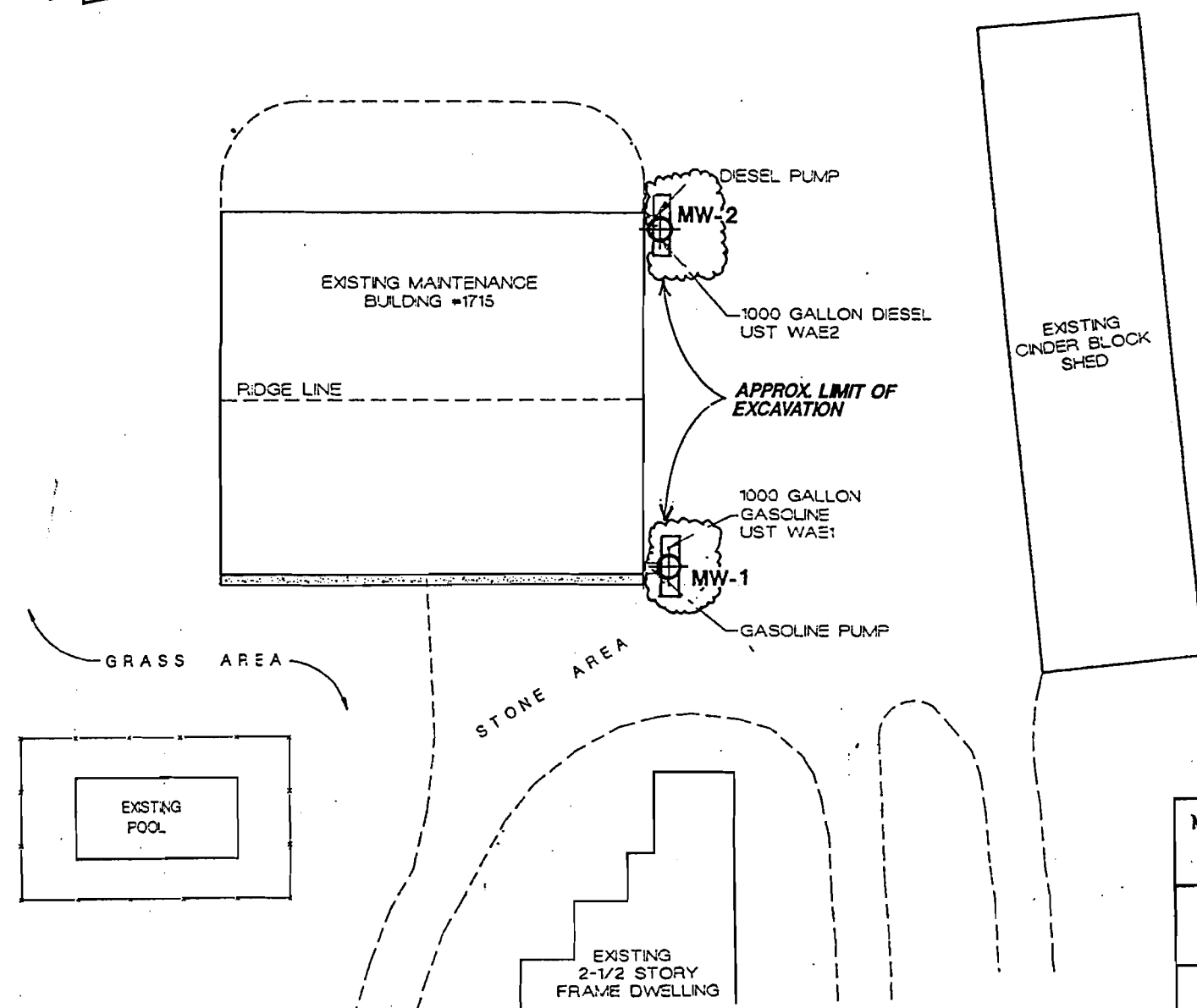
MONMOUTH COUNTY PARK SYSTEM
BOARD OF
RECREATION COMMISSIONERS

PLANS FOR THE
REMOVAL AND REPLACEMENT
OF
STORAGE TANKS

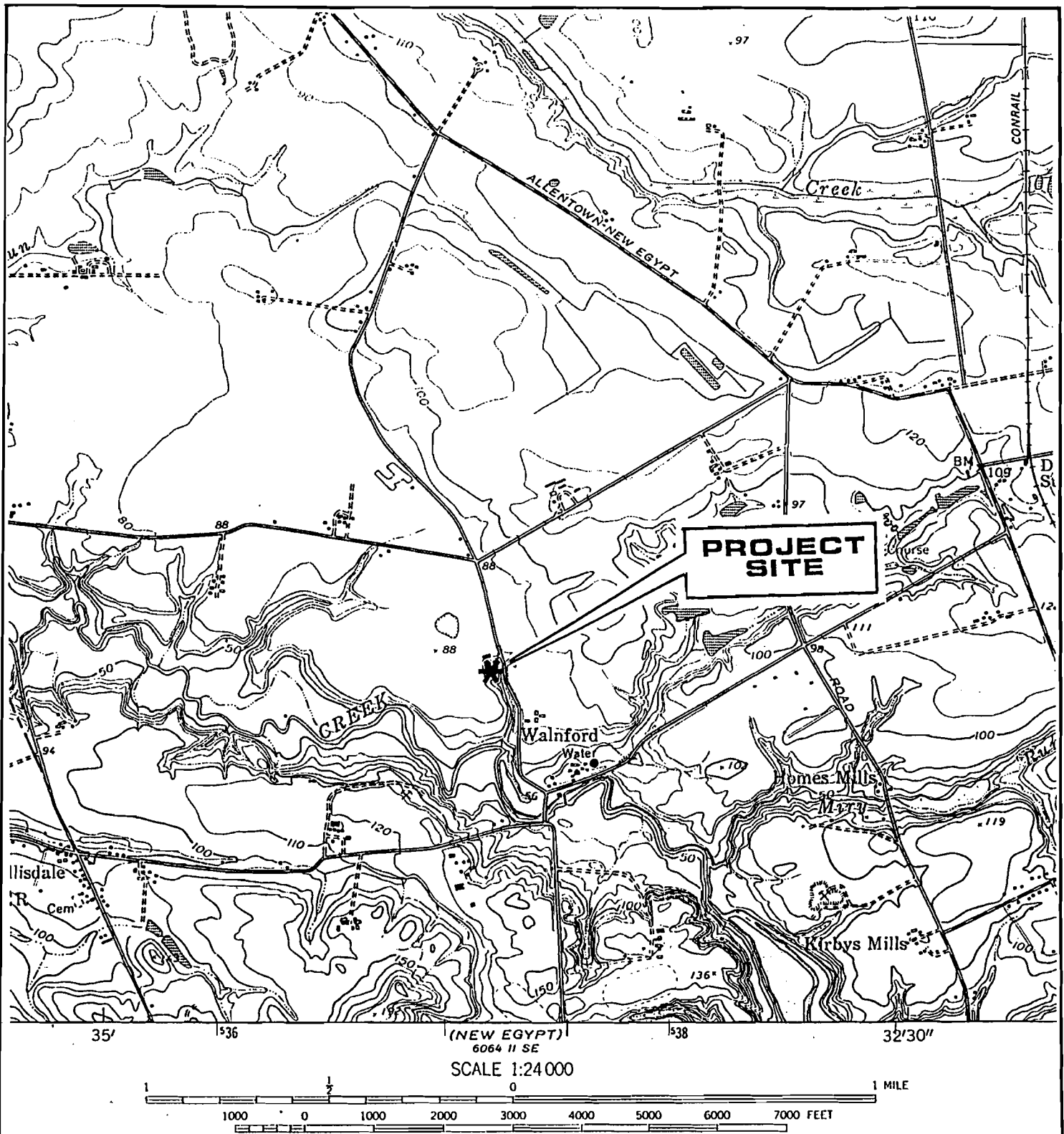
WALNFORD PARK
PROJECT LOCATION MAP

FRENCH & PARRELLO
ASSOCIATES, P.A.
CONSULTING ENGINEERS
870 NORTH BEERS STREET, BLDG. # 3, HOLMDEL, NEW JERSEY

DATE: 9/1/92	SCALE: AS SHOWN
JOB NO. 92E072A	DWG. NO. 1



MONMOUTH COUNTY PARK SYSTEM BOARD OF RECREATION COMMISSIONERS	
PLANS FOR THE REMOVAL AND REPLACEMENT OF STORAGE TANKS	
WALNFORD PARK SITE PLAN	
FRENCH & PARRELLO ASSOCIATES, P.A. CONSULTING ENGINEERS 870 NORTH BIRCH STREET, SUITE 403 HUNTSVILLE, NEW JERSEY 07030	
DATE 11-9-93	SCALE AS SHOWN
JOB NO. 92E0723	DRAWING NO. 2



TOPOGRAPHIC MAP



FRENCH & PARRELLO
ASSOCIATES, P.A.

670 NORTH BEERS STREET, BLDG. No. 3, HOLMDEL, NEW JERSEY, 07733

PROJECT:

WALNFORD PARK
MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS

SCALE:

AS SHOWN

DATE:

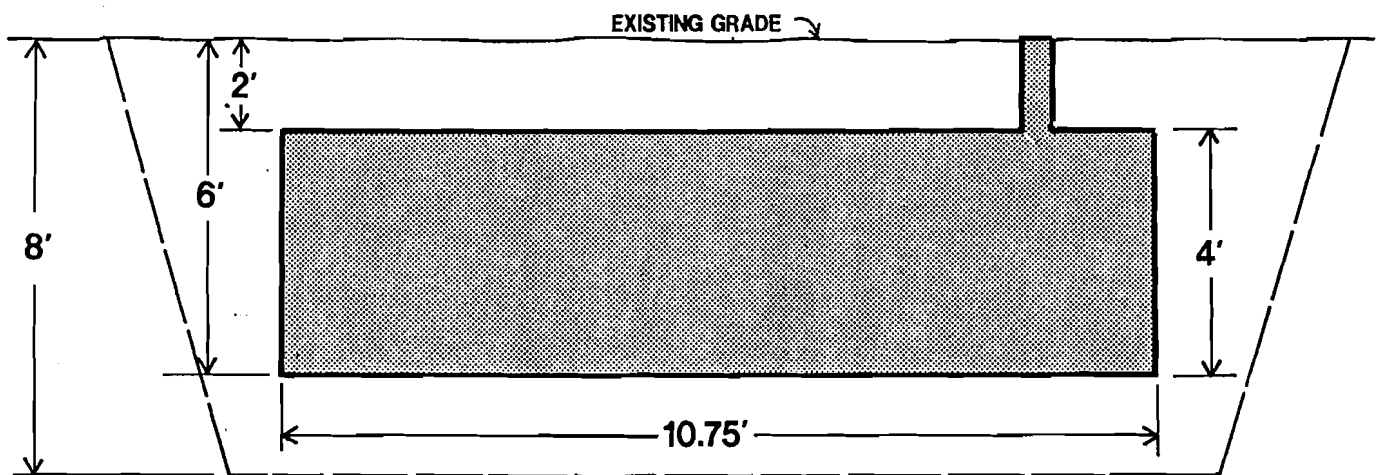
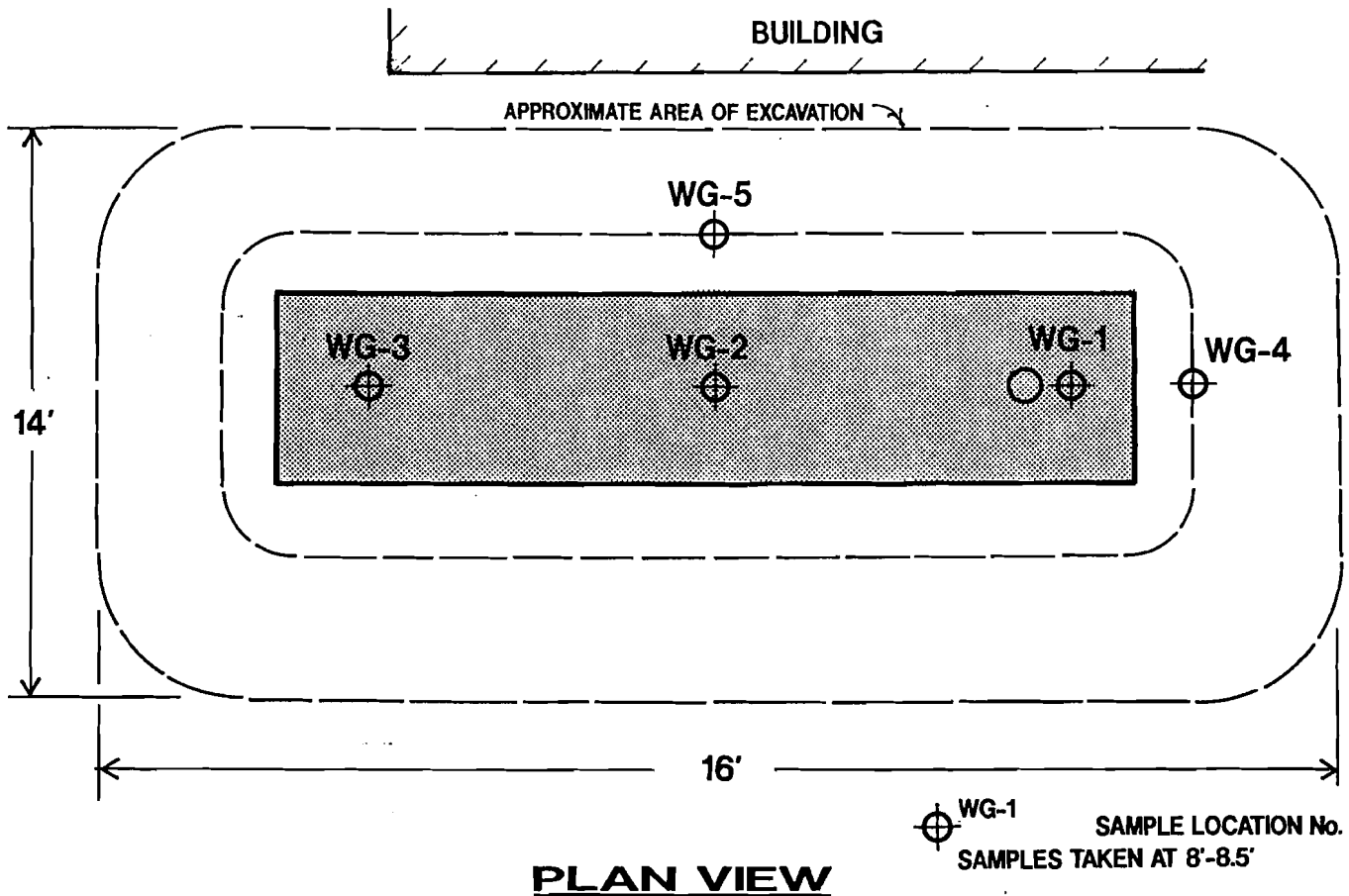
JUNE/7/1995

JOB No.

92E072E

DRAWING No.

3



1000 GALLON GASOLINE UST



FRENCH & PARRELLO
ASSOCIATES, P.A.

670 NORTH BEERS STREET, BLDG. No. 3, HOLMDEL, NEW JERSEY, 07733

PROJECT:

MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK-1

SCALE:

N.T.S.

DATE:

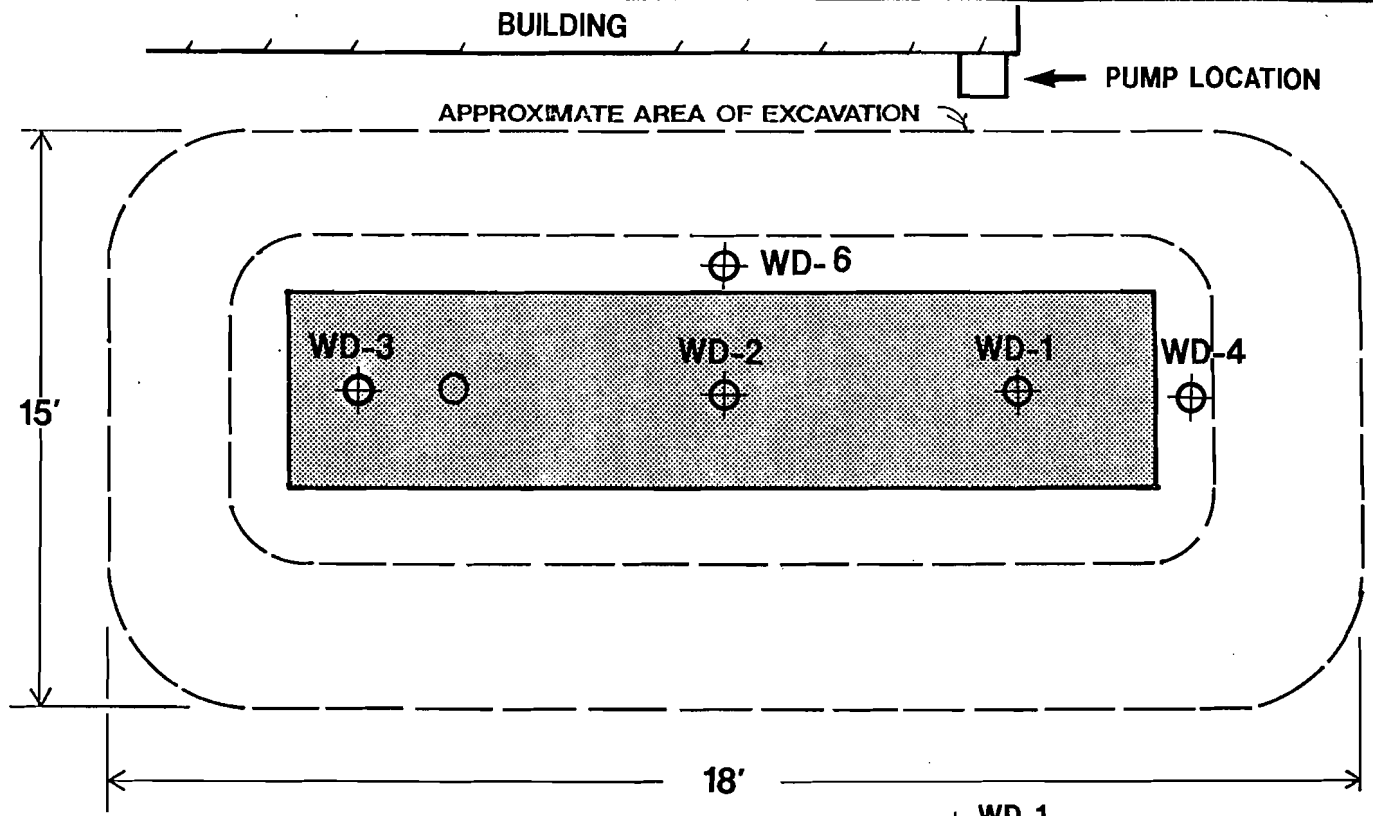
JAN/7/94

JOB No.

92E072B

DRAWING No.

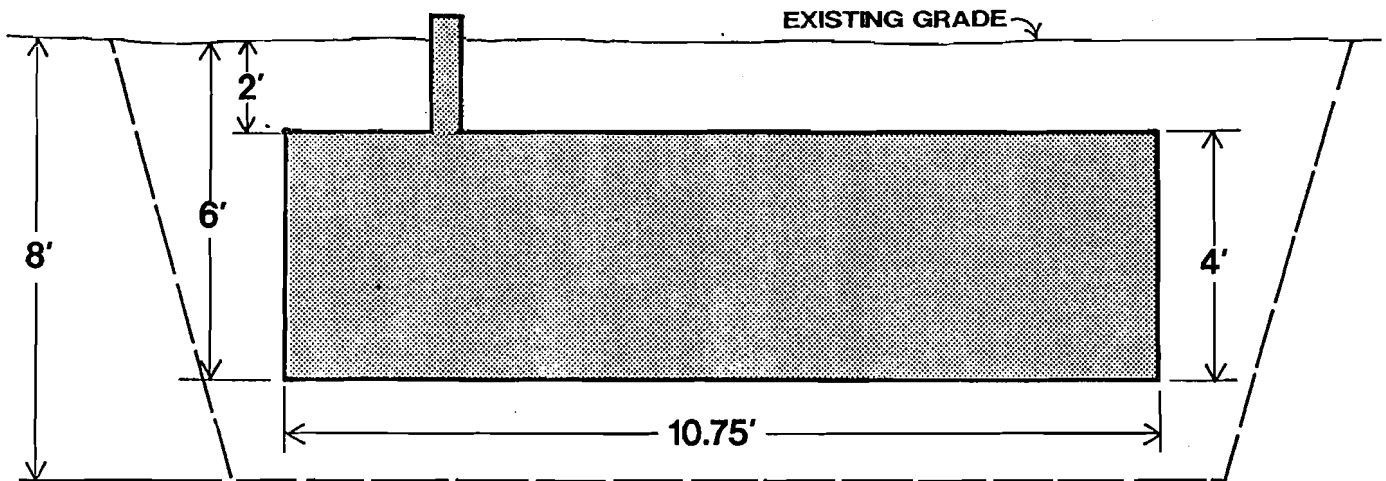
4



NOTE : NO SAMPLE No. WD-5

PLAN VIEW

WD-1
SAMPLE LOCATION No.
SAMPLES TAKEN AT 8'-8.5'



GROUND WATER DEPTH = UNKNOWN

CROSS-SECTION VIEW

1000 GALLON DIESEL UST



FRENCH & PARRELLO
ASSOCIATES, P.A.

670 NORTH BEERS STREET, BLDG. No. 3, HOUNCEL, NEW JERSEY, 07733

PROJECT:

**MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK-2**

SCALE:

N.T.S.

DATE:

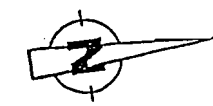
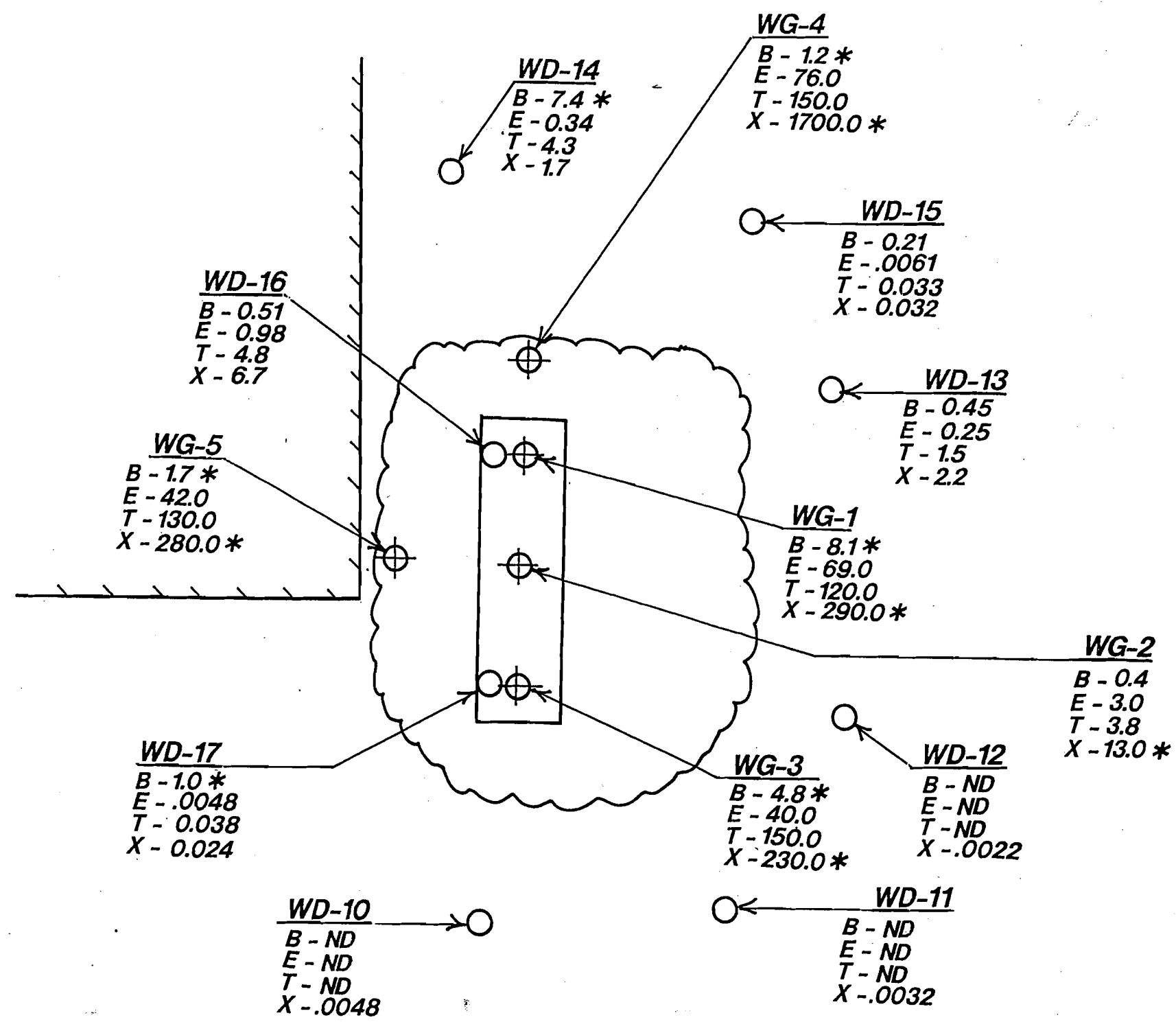
JAN/7/94

JOB No.

92E072B

DRAWING No.

4A



LEGEND :

- POST EXCAVATION SAMPLING LOCATION
- REMEDIAL INVESTIGATION SAMPLING LOCATION

B = BENZENE
E = ETHYLBENZENE
T = TOLUENE
X = XYLENES
NS = NOT SAMPLED
ND = NON DETECT
* = ABOVE STANDARD

NOTE: ALL UNITS ARE PPM

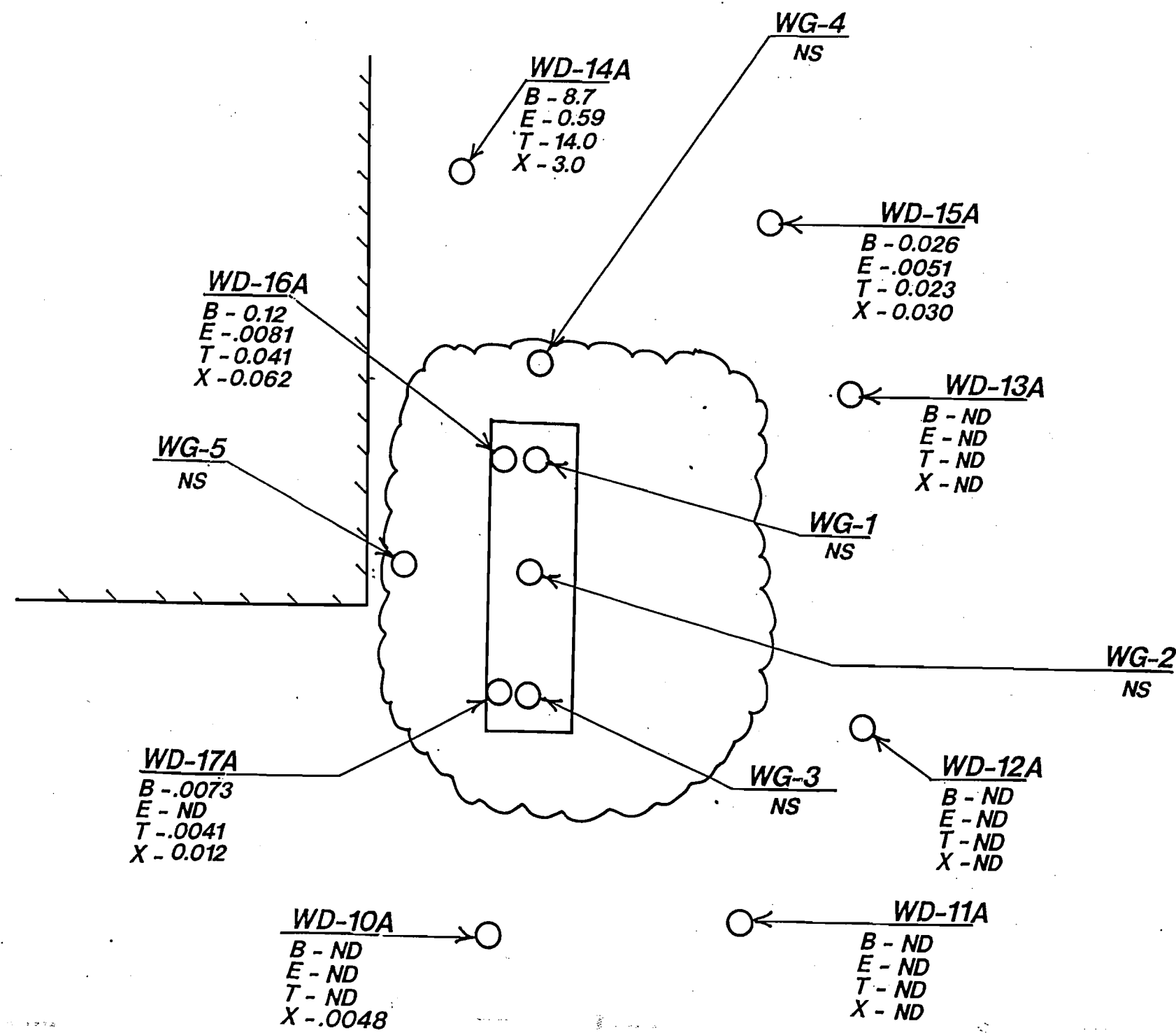


MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK - GASOLINE UST

SAMPLING RESULTS AT 8 - 8.5'

FRENCH & PARRELLO
ASSOCIATES, P.A.
CONSULTING ENGINEERS
670 NORTH BEERS STREET, BLDG. # 3, HOLMDEL, NEW JERSEY

DATE: JUNE/7/1995	SCALE: AS SHOWN
JOB No. 92E072E	DWG. No. 5



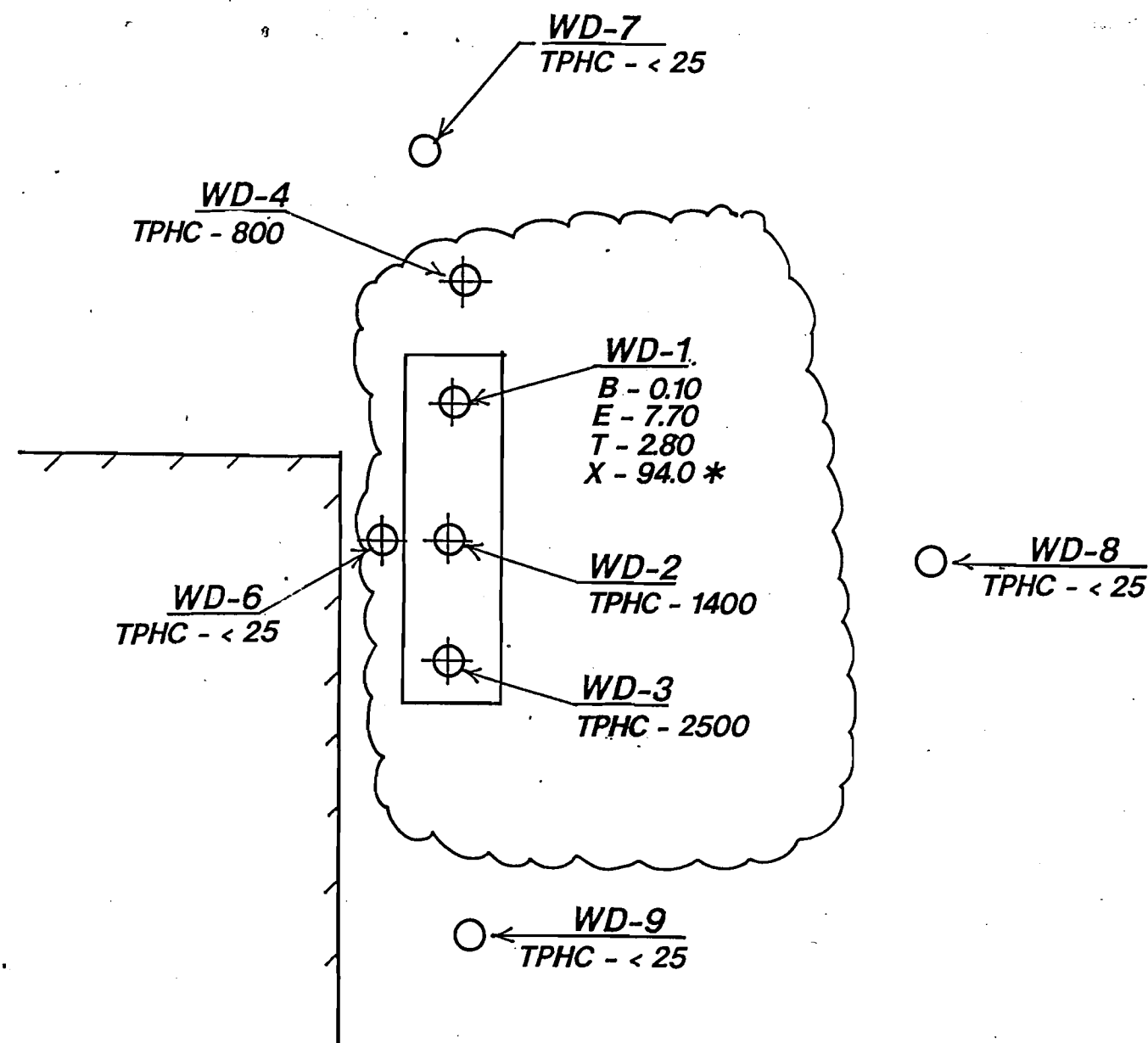
LEGEND :

- POST-EXCAVATION SAMPLING LOCATION
- REMEDIAL INVESTIGATION SAMPLING LOCATION

B = BENZENE
 E = ETHYLBENZENE
 T = TOLUENE
 X = XYLENES
 NS = NOT SAMPLED
 ND = NON DETECT
 * = ABOVE STANDARD

NOTE : ALL UNITS ARE PPM

MONMOUTH COUNTY PARK SYSTEM BOARD OF RECREATION COMMISSIONERS WALNFORD PARK - GASOLINE UST	
SAMPLING RESULTS AT 10 - 10.5'	
FRENCH & PARRELLO ASSOCIATES, P.A. CONSULTING ENGINEERS 670 NORTH BEERS STREET, BLDG. # 3, HOLMDEL, NEW JERSEY	
DATE JUNE/7/1995	SCALE: AS SHOWN
JOB No. 92E072E	DWG. No. 5A



LEGEND :

⊕ POST-EXCAVATION SAMPLING LOCATION

○ REMEDIAL INVESTIGATION SAMPLING LOCATION

B = BENZENE

E = ETHYLBENZENE

T = TOLUENE

X = XYLENES

NS = NOT SAMPLED

ND = NON DETECT

* = ABOVE STANDARD

NOTE : ALL UNITS ARE PPM

MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK - DIESEL UST

SAMPLING RESULTS AT 8 - 8.5'



FRENCH & PARRELLO
ASSOCIATES, P.A.

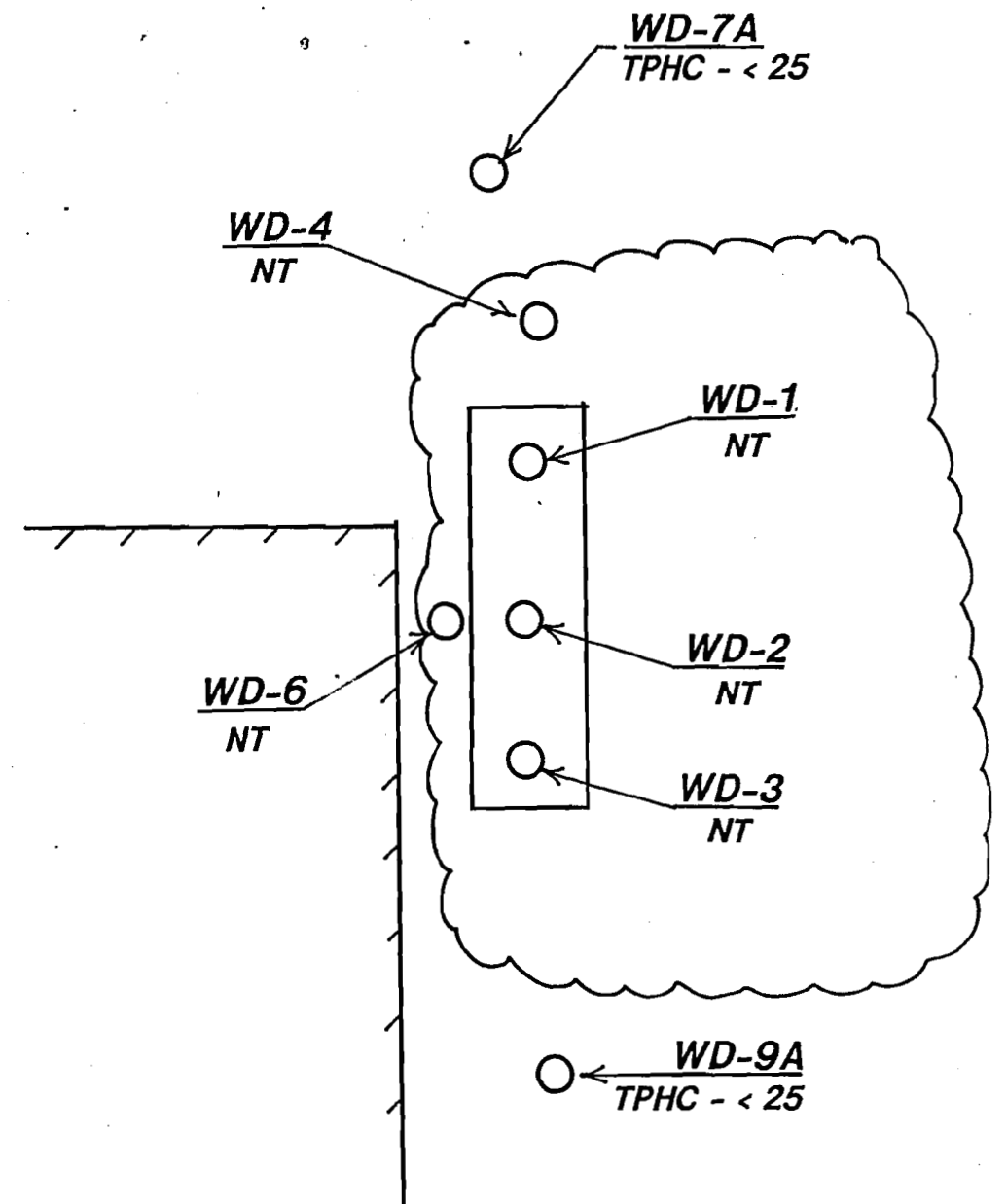
CONSULTING ENGINEERS
670 NORTH BEERS STREET, BLDG. # 3, HOLMDEL, NEW JERSEY

DATE: JUNE/7/1995

SCALE: AS SHOWN

JOB No. 92E072E

DWG. No. 6



0 5'
SCALE IN FEET

REMEDIAL ACTION WORKPLAN

**Monmouth County Park System
Walnford Park - Maintenance Building
Walns Mill (Hill) Road
Allentown (Upper Freehold), Monmouth County, New Jersey**

**NJDEP Case #93-12-17-1452-46 &
NJDEP Case #93-12-17-1205-53**

November 8, 1996

**Prepared for:
Monmouth County Park System
805 Newman Springs Road
Lincroft, NJ**

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FIGURES

- Figure 1 - County Roadway Map
- Figure 2 - USGS Topographical Map
- Figure 3 - Site Map
- Figure 4 - Soil Sample Locations Map
- Figure 5 - Ground Water Flow Map
- Figure 6 - Classification Exception Area & Well Restriction Area Designation Map

EXHIBITS

- Exhibit I - Disposal Manifest
- Exhibit II - Laboratory Analytical Data (Soil)
- Exhibit III - Monitoring Well Permit, Well Record, Boring Log, Certification
Forms A and B, Well Abandonment Form
- Exhibit IV - Monitoring Well Sampling Data Forms
- Exhibit V - Laboratory Analytical Data (Ground Water)
- Exhibit VI - Aquifer Testing Data
- Exhibit VII - CEA and WRA Applications

**Remedial Action Workplan
For
Monmouth County Park System
Walnford Park - Maintenance Building
Walns Mill (Hill) Road
Allentown, Monmouth County, New Jersey
NJDEP Case #93-12-17-1452-46 &
NJDEP Case #93-12-17-1205-53**

November 8, 1996

1.0 TECHNICAL OVERVIEW

On April 12, 1996, Brinkerhoff Environmental Services, Inc. (BES) was contacted by Monmouth County Park System (MCPS) to prepare a Remedial Action Workplan (RAW) for a discharge from a 1,000-gallon gasoline underground storage tank (UST) and a 1,000-gallon diesel UST formerly located at the maintenance building at Walnford Park. Walnford Park is located at Walns Mill (Hill) Road in Allentown, Monmouth County, New Jersey. (See Figures 1 and 2.)

During December of 1993, a 1,000-gallon gasoline UST and a 1,000-gallon diesel UST were decommissioned by removal and the environmental assessment was conducted by French & Parrello Associates, P.A. (FPA). The UST's were located on the north side of the maintenance building, as illustrated in Figure 3. Evidence of a release was observed during removals of both UST's. The New Jersey Department of Environmental Protection (NJDEP) Hotline was contacted and two (2) case numbers were issued, #93-12-17-1452-46 for the gasoline UST and #93-12-17-1205-53 for the diesel UST. Postexcavation soil samples and Hydropunch ground water samples were collected by FPA as part of the investigation. FPA submitted a Remedial Investigation (RI) Report on June 20, 1995.

As part of the RAW, BES excavated, stockpiled and disposed of soil, collected postexcavation soil samples, installed two (2) ground water monitoring wells, conducted sampling and analysis, and performed aquifer tests to develop pollutant transport models. This RAW presents the findings of BES' additional investigation and proposes natural remediation with a Classification Exception Area (CEA) and Well Restriction Area (WRA) as the means of achieving the requirements set forth in the Technical Requirements for Site Remediation (N.J.A.C. 7:26E) and the Groundwater Quality Standards (N.J.A.C. 7:9-6).

2.0 REMEDIAL INVESTIGATION

2.1 Soil Investigation

2.1.1 Excavation and Disposal - Former Gasoline UST

On May 30, 1996, BES excavated and stockpiled 45 tons of petroleum-contaminated soil from the former 1,000-gallon gasoline UST area. On July 11, 1996, the soil was transported by Aforce, Inc. of Oceanport, New Jersey, and disposed of at Middlesex County Utilities Authority, Edgeboro Landfill. The disposal manifests are provided in Exhibit I.

2.1.2 Postexcavation Soil Samples - Former Gasoline UST

On May 30, 1996, five (5) postexcavation soil samples were collected from within the former gasoline UST excavation area as depicted in Figure 4. Soil samples were collected at horizontal and vertical locations in the subsurface sediments to demonstrate that contaminated soil detected in FPA's sampling was removed. Samples were field-screened using an Hnu photoionization detector (PID). Soil sample depths and PID readings are summarized in Table 1.

Samples were submitted to a New Jersey certified laboratory and analyzed for volatile organics with a forward library search (VO+10) and lead. Ground water was not encountered during the excavation. Sample Location G-3 was collected approximately two (2) feet under the adjacent garage and at a depth of nine (9) feet below grade. Additional soil could not be removed without significant undermining of the floor of the garage.

Table 1
Postexcavation Soil Sampling Information

Sample	Type	Depth	Date	Hnu Readings	Analysis
GS-1	Side wall	13-13.25'	5-30-96	180	VO+10 & Lead
GS-2	Bottom	10-10.5'	5-30-96	170	VO+10 & Lead
GS-3	Side wall	9-9.5'	5-30-96	416	VO+10 & Lead
GS-4	Side wall	9-9.5'	5-30-96	54	VO+10 & Lead
GS-5	Side wall	9-9.5'	5-30-96	7	VO+10 & Lead

PID readings in meter units.

Soil analytical results are summarized in Table 2 below and included in Exhibit II.

Table 2
Soil Sampling Results
Volatile Organics and Lead
(Results in parts per million)

Compound	GS-1	GS-2	GS-3	GS-4	GS-5	*NJDEP
Benzene	0.92	ND	0.88	0.11D	0.037D	1
Toluene	1.4	2.7D	17	0.041D	0.047D	500
Ethylbenzene	0.37	.62D	7.8	0.037D	ND	100
Xylenes	2.05	5.5D	59	1.6D	0.93D	10
Acetone	0.9	ND	8.2	0.84D	0.47D	100
2-Butanone	0.47	ND	ND	ND	0.055D	100
Lead	ND	ND	ND	ND	ND	600

*NJDEP - Impact to Ground Water Soil Cleanup Criteria - Non-Residential Direct Contact Soil Cleanup Criteria listed for Lead; D - indicates result is based on a dilution; ND - compound not detected; Note - Methylene Chloride, a common lab contaminate, was detected in Samples 1, 2, 3, and 4.

Laboratory analytical data reported no target compounds over NJDEP Soil Cleanup Criteria in Samples GS-1, GS-2, GS-4 and GS-5. However, Sample GS-3 contained total xylenes above NJDEP Soil Cleanup Criteria. Based on the soil samples collected by both FPA and BES, no future action is proposed for the former gasoline UST excavation with regard to soil. A natural remediation and CEA program are being proposed for this area which incorporates the soil. The natural remediation program is illustrated in Section 4.1, proposed RAW.

2.1.3 Former Diesel UST Investigation

BES attempted to excavate soil in the former diesel UST excavation where one (1) soil sample reported elevated xylenes. Due to the loose nature of the soil, the walls of the excavation continued to collapse, undermining the garage floor, and jeopardizing Monitoring Well MW-2.

BES is proposing no further action with regard to soil associated with the former diesel UST area. Two (2) rounds of ground water sampling and analyses of MW-2, located within the former excavation and within five (5) feet of the soil sample with elevated levels of xylenes, reported nondetectable levels of xylenes. (See Section 3.0.) Based on historical ground water sampling and analysis, this limited area of soil affected by xylene compounds is not impacting ground water. This suggests that the quantity of soil affected is minimal and likely represents a de minimus quantity which should naturally degrade over time.

3.0 GROUND WATER INVESTIGATION

3.1 Monitoring Well Installation and Site Hydrogeology

On July 18, 1996, two (2) four (4) inch diameter, schedule 40 PVC, ground water monitoring wells, MW-7 and MW-8, were installed and developed in the unconfined surface aquifer at Walnford Park. The casing elevations of the two (2) wells were determined by a NJ licensed land surveyor. A ground water monitoring well permit, record, boring log, and Certification Forms "A" and "B" are included in Exhibit III. Well locations are depicted on Figure 3. Monitoring Wells MW-7 and MW-8 were installed and developed in a downgradient direction of ground water flow.

The excavation of contaminated soil from within the former gasoline UST area required the abandonment of Monitoring Well MW-1. The entire monitoring well was excavated using a backhoe. The well abandonment form is provided in Exhibit III.

On August 6, 1996, five (5) monitoring wells, MW-2, MW-4, MW-5, MW-7 and MW-8, were gauged and sampled. Gauging activities included the collection of well headspace readings using a PID, measurement of ground water elevation, temperature, pH, conductivity, dissolved oxygen, and calculation of water volumes within each well. Gauging data and field readings are shown in Tables 3 and 4 below and monitoring well sampling data forms are included in Exhibit IV.

Table 3
Ground Water Monitoring Well Gauging Data
August 6, 1996

Well #	Headspace (meter units)	Total Depth	Casing Elev.	Ground Water Depth	Ground Water Elev.
MW-2	3.0	17.5'	96.03'	6.28'	89.75'
MW-4	0.0	15.0'	91.27'	2.82'	88.90'
MW-5	0.0	15.0'	92.83'	5.73'	87.10'
MW-7	3.0	17.9'	95.02'	4.83'	90.19'
MW-8	0.0	18.5'	92.40'	3.21'	89.19'

No separate phase product or sheen was noted during monitoring.

Table 4
Ground Water Monitoring Well Field Readings
August 6, 1996

Prior to Excavation					Subsequent to Sampling			
Well#	pH	Temp. °C	Cond. (mV)	D.O. (mg/l)	pH	Temp. °C	Cond. (mV)	D.O. (mg/l)
MW-2	4.3	23.5	78	4.1	7.1	22.0	118	6.2
MW-4	3.4	21.5	167	2.5	4.8	23.0	103	5.4
MW-5	2.3	19.4	178	7.1	5.0	22.3	156	7.0
MW-7	2.7	22.1	206	2.4	5.7	20.1	156	1.6
MW-8	3.8	22.9	174	1.7	5.6	23.3	154	6.0

Ground water was encountered at an average depth of four (4) feet below grade. Ground water flow direction is toward the south as illustrated in Figure 5. Boring logs show subsurface soils to consist of dark red-brown sandy loam to approximately four-and-one-half (4½) feet below grade. Below four-and-one-half (4½) feet, sediments consist of dark gray-brown silty loam. This dark gray silty loam represents the Marshalltown Formation, considered a nonwater-bearing formation, as documented by the low permeability obtained during BES' investigation. The formation appears to be 30 to 40 feet thick in the study area, as documented by drilling logs of potable wells in the area. (See FPA report dated June 20, 1995.) It is within the upper portion of this formation that the petroleum-impacted ground water exists. It should be noted that ground water was not encountered by BES during excavation work at site.

3.2 Ground Water Sampling and Analysis

Following well gauging, ground water samples were collected from Wells MW-2, MW-4, MW-5, MW-7 and MW-8 following procedures outlined in the NJDEP's May 1992 *Field Procedures Sampling Manual*. Three (3) to five (5) volumes of water were evacuated from each well using a centrifugal pump and dedicated polytubing. Samples were collected using dedicated Teflon bailers, and immediately transferred to sample containers suitable for the target pollutants. Chain of custody documentation and field and trip blanks were maintained with the samples which were transported to a New Jersey certified lab for analysis. Samples were analyzed for VO+10, including xylenes, methyl tert-butyl ether (MTBE), tertiary butyl alcohol (TBA) and lead. Laboratory analytical results are summarized in Table 5 and included in Exhibit VI.

Table 5
Ground Water Sampling Results
August 6, 1996
 (Results in parts per billion)

Compound	MW-2	MW-4	MW-5	MW-7	MW-8	*NJDEP Std.
Benzene	ND	ND	ND	110	ND	1
Toluene	ND	ND	.9	19	ND	1000
Ethylbenzene	ND	ND	ND	45	ND	700
Xylenes	ND	ND	ND	47	ND	40
MTBE	ND	ND	ND	ND	ND	700
TBA	ND	ND	ND	ND	ND	500
Lead	ND	ND	ND	ND	ND	10

*NJDEP Std. - NJDEP Class II-A Ground Water Quality Standards; ND - compound not detected above the method detection limit; D - indicates result is based on a dilution; Acetone, a common lab contaminant, was detected in MW-7.

Ground water analytical results reported elevated levels of benzene and total xylenes in Well MW-7, the well nearest the former excavation in the downgradient direction. The remaining wells, MW-2, MW-4, MW-5 and MW-8, reported nondetectable levels of gasoline-related compounds. MTBE, TBA and lead were not detected in any of the wells sampled.

3.3 Historical Ground Water Sampling Results

Historically, ground water sampling results for the six (6) monitoring wells at Walnford Park have show elevated levels of BTEX and MTBE only in Well MW-1. (See Table 6.) Monitoring Well MW-1, formerly located within the former 1,000-gallon gasoline UST excavation, was removed on May 30, 1996, when postexcavation soil samples were taken.

Table 6
Historical Ground Water Sampling Results
Walnford Park
 (Results in parts per billion)

Well	Date	Benzene	Ethylbenzene	Toluene	Xylenes	MTBE	TBA	TIC's
MW-1	3/28/95	9,900	790	8,700	4,000	10,000	ND	1,200
	4/17/95	11,000	600	8,900	3,700	9,200	ND	2,690
MW-2	3/28/95	ND	ND	ND	ND	ND	ND	ND
	4/17/95	NT	NT	NT	NT	NT	NT	NT
MW-3	3/28/95	ND	ND	ND	ND	ND	ND	ND
	4/17/95	ND	ND	ND	ND	ND	ND	ND
MW-4	3/28/95	ND	ND	ND	ND	ND	ND	ND
	4/17/95	ND	ND	ND	ND	ND	ND	ND
MW-5	3/28/95	ND	ND	ND	ND	ND	ND	ND
	4/17/95	ND	ND	ND	ND	ND	ND	ND
MW-6	3/28/95	ND	ND	ND	ND	ND	ND	ND
	4/17/95	ND	ND	ND	ND	ND	ND	ND
NJDEP Std.		1	700	1,000	40	700	500	-

ND-not detected; NT-not detected.

4.0 Remedial Action Workplan

4.1 Overview

BES is proposing a natural remediation program with a CEA and a WRA for the former gasoline UST area. Postexcavation soil samples have shown no petroleum-related compounds above soil cleanup criteria within the former UST excavation. It is likely this "zone" of contamination is a deminimus quantity, six (6) inch lens over a 10-foot radius, for which natural remediation should be sufficient to eventually reduce concentrations to within acceptable levels.

Historical ground water sampling and analysis has shown limited migration of petroleum-related compounds from the former gasoline UST area. Ground water velocity rates were calculated at less than two (2) feet per year. Dissolved oxygen levels are greater than (two) 2 parts per million (ppm), representing an aerobic aquifer environment conducive for natural degradation of petroleum compounds. Lower dissolved oxygen values within the plume area suggest biological processes are occurring, indicating natural remediation is working.

Regarding the former diesel UST area, since historical ground water analytical data indicates no impact to ground water, no further action is needed with regard to ground water. The one (1) soil sample which reported elevated xylenes likely represents a deminimus quantity of impacted soil since no evidence of ground water impact was noted. Natural remediation of this limited petroleum-impacted soil is proposed.

According to the receptor survey prepared by FPA and supplemented by BES, the potable wells in the area produce from the deeper Englishtown Formation found between 75 and 100 feet below

grade. Screen intervals of potable wells in the area range between 90 and 97 feet below grade. With the exception of the potable well on site, the nearest downgradient potable well is located 1,500 feet from the site. The nearest upgradient well is located 1,000 feet from the site. According to MCPS officials, the location and depth of the potable well on site can not be verified. Information provided in the FPA June 20, 1995 report indicates the potable well may be located approximately 10 feet northwest of the residential house on site (see water well data sheet in exhibit III). This would place the well near the stone sidewalk south of MW-6 (see figure 3). This well likely produces from a depth similar to the other wells in the area, since shallower sediments do not produce sufficient water for potable use.

4.2 Aquifer Characteristics & Classification Exception Area Application

4.2.1 Hydraulic Gradient

On August 6, 1996, prior to well purging and sampling, five (5) on-site ground water monitoring wells, MW-2 MW-4, MW-5, MW-7 and MW-8, were gauged. Depth to ground water varied throughout. By subtracting depth to ground water from the surveyed well casing elevation, ground water elevations and flow direction were calculated. Ground water flow direction is south with an average hydraulic gradient of 0.010 feet per foot (ft/ft).

4.2.2 Hydraulic Conductivity

To evaluate hydraulic conductivity, BES field personnel conducted aquifer "slug" testing on Wells MW-7 and MW-8. A volume of water was removed from each well using a dedicated stainless steel bailer while monitoring changes in static water level over time using a Hermit Data Logger. A quantitative hydrogeologic assessment of the data was performed using the AQTESOLV ground water modeling program. The slug test data was analyzed using the Bouwer and Rice method for unconfined aquifers. Hydraulic conductivity and ground water and pollutant transport rates were calculated using the slug test data and AQTESOLV modeling calculations. Slug test data is included in Exhibit VI of this report.

4.2.3 Ground Water Velocity

The rate of ground water movement in the area of concern was determined using the ground water velocity equation derived from a combination of Darcy's law and the velocity equation of hydraulics. Ground water velocity was then expressed as:

$$V_s = K \times i / n_e$$

Where: V_s = seepage velocity
 K = hydraulic conductivity (calculated from slug test data)
 i = hydraulic gradient (calculated from ground water flow data)
 n_e = effective porosity (assumed at 35%)
 $\times$ = multiplication symbol

Ground water velocity in the area of concern was then calculated:

$$V_s = 0.0000857 \text{ ft/min} \times .010 \text{ ft/ft} / 0.35$$

$$V_s = 0.0000024 \text{ ft/min or } 1.26 \text{ ft/yr.}$$

Assuming a porosity of 35%, and using a calculated hydraulic gradient of 0.01 ft/ft obtained from the August 6, 1996 ground water contour map, ground water velocity is determined to be 1.26 feet per year (ft/yr).

4.2.4 Pollutant Transport Rate

Applying a pollutant transport rate calculation to the ground water velocity rate, calculated above, the following retardation factor is derived:

$$R_d = 1 + (KOC \times f_{oc} \times p_b / n_e)$$

Where: R_d = retardation factor
 KOC = soil sorption coefficient (63 - standard benzene coefficient)
 f_{oc} = fraction of organic carbon (assumed at 0.005)
 p_b = bulk density (assumed at 1.5 g/ml.)
 n_e = effective porosity (assumed at 35%)

The retardation factor is then calculated:

$$R_d = 1 + (63 \times 0.005 \times 1.5 / 0.35)$$

$$R_d = 2.35$$

The pollutant (benzene) transport rate is then calculated as follows:

$$V_{pt} = V / R_d$$

$$V_{pt} = 1.26 \text{ ft/yr.} / 2.35$$

$$V_{pt} = .54 \text{ ft/yr.}$$

Using this formula, assuming a bulk density of 1.5 grams per milliliter, a fraction of organic carbon content of 0.5%, and a porosity of 35%, the benzene transport rate is calculated to be approximately 0.54 ft/yr.

4.2.5 Benzene Half-Life

The two (2) additional monitoring wells, MW-7 and MW-8, at Walnford Park were installed on July 17, 1996. These two wells have been sampled only once, so no historical ground water information for the excavation area is available. Therefore, the benzene half-life will be calculated based on FPA ground water sampling historical data from former Monitoring Well MW-1 and applied to MW-7.

Benzene Half-Life:

$$\text{Half-Life} = 0.693 \times \text{Change in time} / (\ln C / C_o)$$

Where:

Change in time = date of initial sampling to date of most recent sampling
of well MW-1 (3/28/95 to 4/17/95)

C = initial benzene concentration (MW-1)

Co = most recent benzene concentration (MW-1)

0.693 = standard coefficient for Half-Life calculation

ln = natural log

x = multiplication symbol

Half-Life = $0.693 \times 20 \text{ days} / \ln 11000 \text{ ppb} / 9900 \text{ ppb}$

Half-Life = 131.55 days (132 days)

Duration to reach NJDEP Ground Water Quality Standards:

<u>Number of Days</u>	<u>Benzene Concentration</u>
0	110
132	55
264	27.5
528	13.75
1056	6.88
2112	3.44
4224	1.72
6680	1.00

Duration of CEA = 6680 days or 18.30 years

Length of CEA = 18.30 years x Vpt
= 18.30 years x .54 ft/yr.
= 9.88 ft

Based on the benzene transport rate calculated above, a benzene half-life of 132 days and an initial benzene concentration of 110 ppb (August 6, 1996), dissolved benzene concentrations are expected to naturally degrade to 1.0 ppb within approximately 18.30 years and 9.88 feet downgradient of MW-7.

A CEA and a WRA designation is requested, using natural attenuation as the method of remediation for a duration of 20 years, and covering an area of 150 feet by 150 feet of Walnford Park as depicted on Figure 6 - Classification Exception Area Designation Map. Numerical modeling demonstrates the CEA need only be placed 9.88 feet downgradient of MW-7 for a period of 18.30 years, but has been expanded as a conservative measure. CEA and WRA designation forms are included in Exhibit VII and an application is present below.

4.2.6 Classification Exception Area & Well Restriction Area Application

A CEA and a WRA are being proposed on a portion of Lot 2.01, Block 49, Township of Allentown, Monmouth County, New Jersey. The area totals approximately 22,500 square feet, as

depicted on Figure 8. The CEA and WRA would restrict the use of the shallow water table aquifer within this area. Irrigation and/or potable wells that produce from the shallow water table aquifer could not be installed within this area.

The CEA and WRA would be in place for 20 years, which would provide sufficient time to allow benzene and other compounds to degrade to below the NJDEP Class II-A GWQS. Assuming a benzene half-life of 132 days and an initial benzene concentration of 110 ppb (August 6, 1996), benzene concentrations should continue to degrade to below 1.0 ppb, through natural attenuation, in approximately 18.30 years from the most recent sampling round (August 6, 1996), taking into account varying geologic, hydrogeologic and degradation variables.

A 20-year CEA should allow for the variations in subsurface conditions which affect the natural remediation process, and provide adequate time for natural remediation to occur. The CEA would apply to the petroleum-related compounds detected in the ground water at the Walnford Park site.

5.0 RECOMMENDATIONS

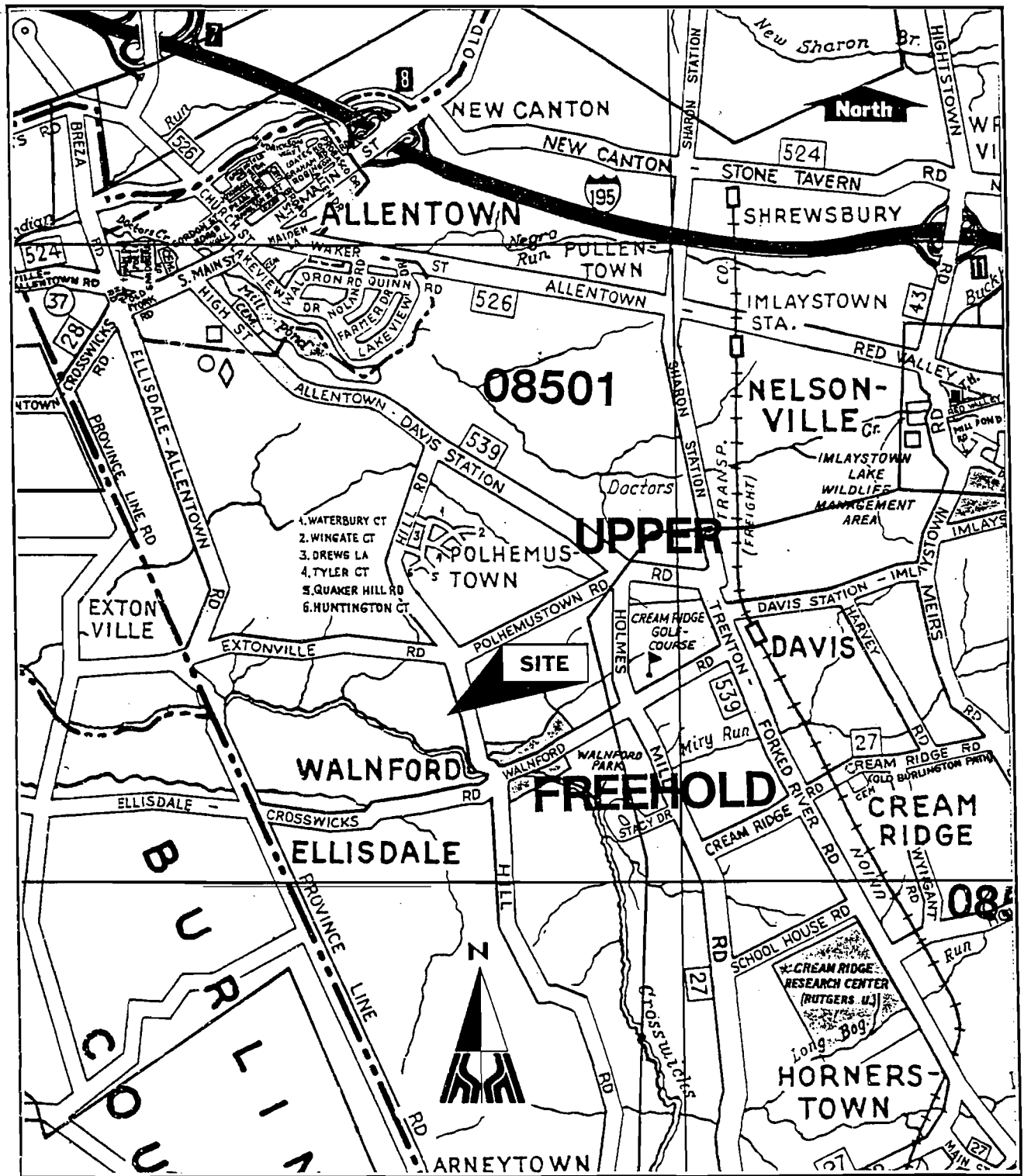
Based on information summarized in this report, BES recommends natural attenuation be considered for remediation at this site. Laboratory analytical data and site specific geologic and hydrogeologic conditions favor natural attenuation. Site specific ground water sampling results indicate natural attenuation is an effective remedial mechanism at the site. In addition, the combination of a limited extent of impacted ground water, a slow migration rate, the presence of a low permeability soil type, the removal of the source, and the lack of receptors in the area (as discussed in the FPA June 20, 1995 RI report) suggest natural attenuation will be an effective option for this site.

Current and potential ground water uses within the proposed CEA and WRA designation area are not expected to change within the proposed CEA duration of 20 years. Potable wells are used in the area, including an on-site well. The shallow aquifer (Marshalltown Formation), which is the aquifer affected by the discharge, is not considered a water-bearing zone. Potable water is obtained from the deeper Englishtown Formation at a depth of between 70 and 90 feet.

This report was prepared and is respectfully submitted by:

BRINKERHOFF ENVIRONMENTAL SERVICES, INC.

DOUG HARM, P.G.	Date
Principal Consultant/Hydrogeologist	
NJDEP Subsurface Evaluator No. 10556	



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 1-

COUNTY ROADWAY MAP

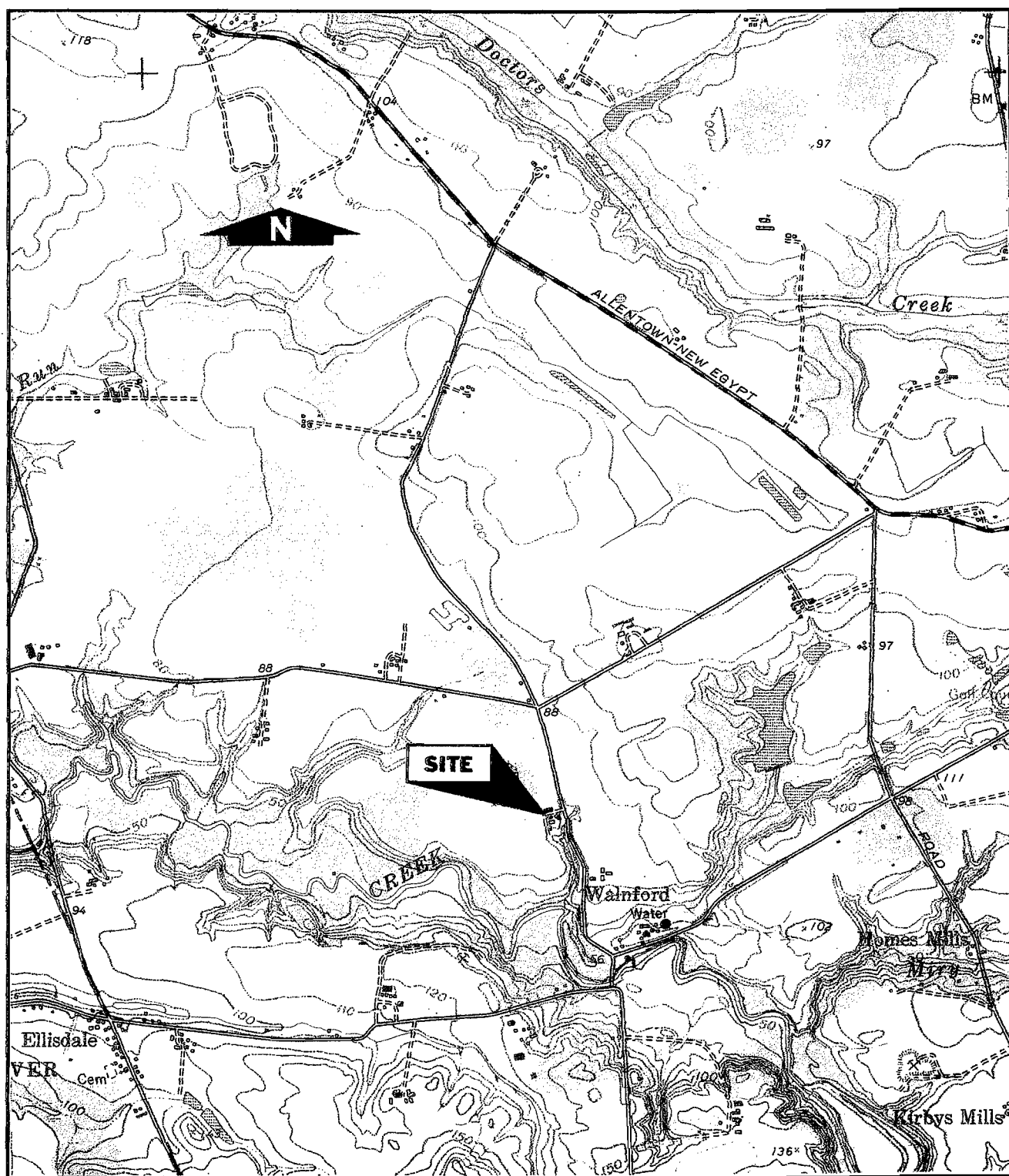
Walnford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Monmouth County Hagstrom

Scale: 1" = 2,000'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 2-

U.S.G.S. TOPOGRAPHICAL MAP

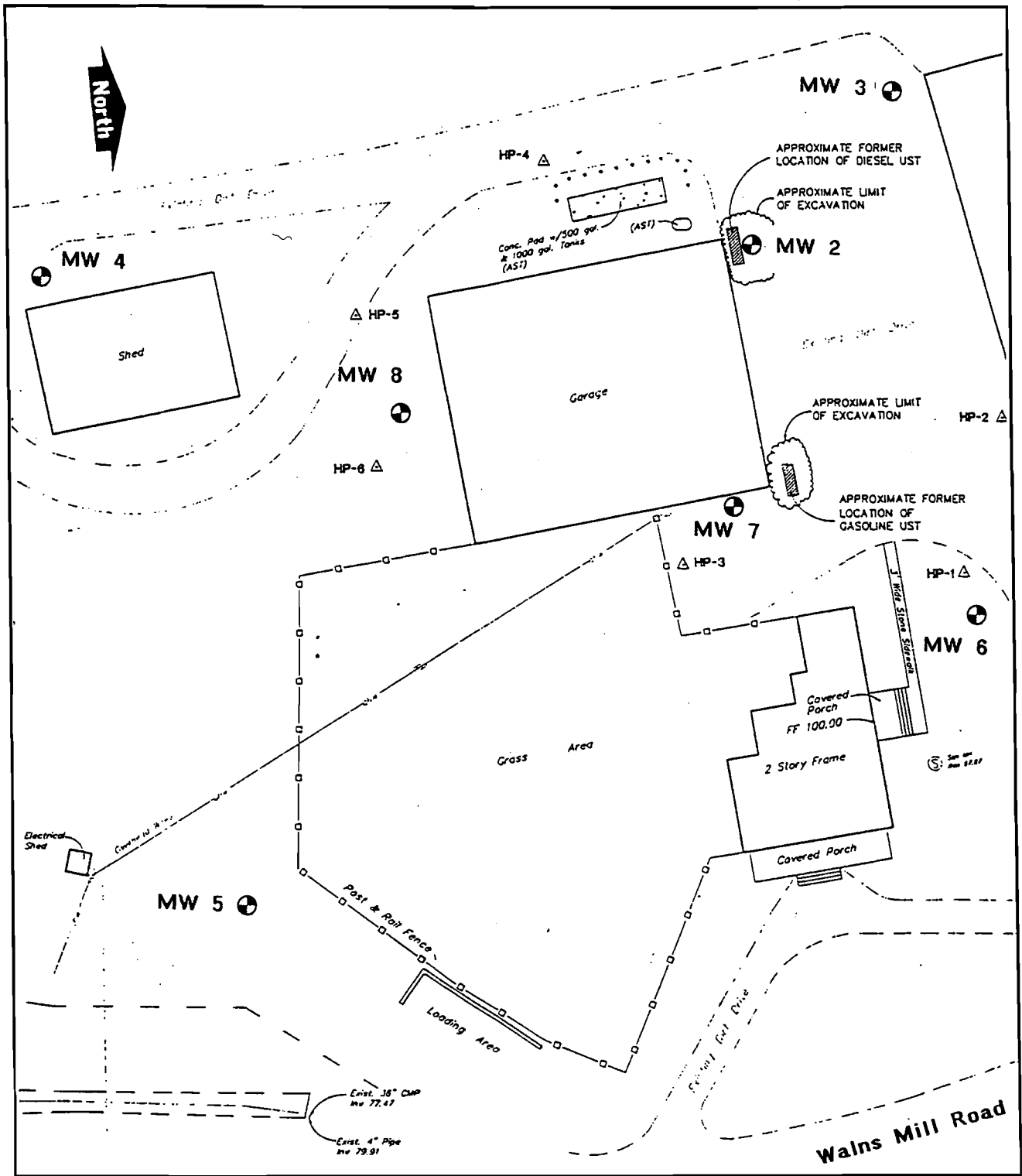
Wainford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Allentown Quadrangle

Scale: 1" = 2,000'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 3-

SITE MAP
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 40'

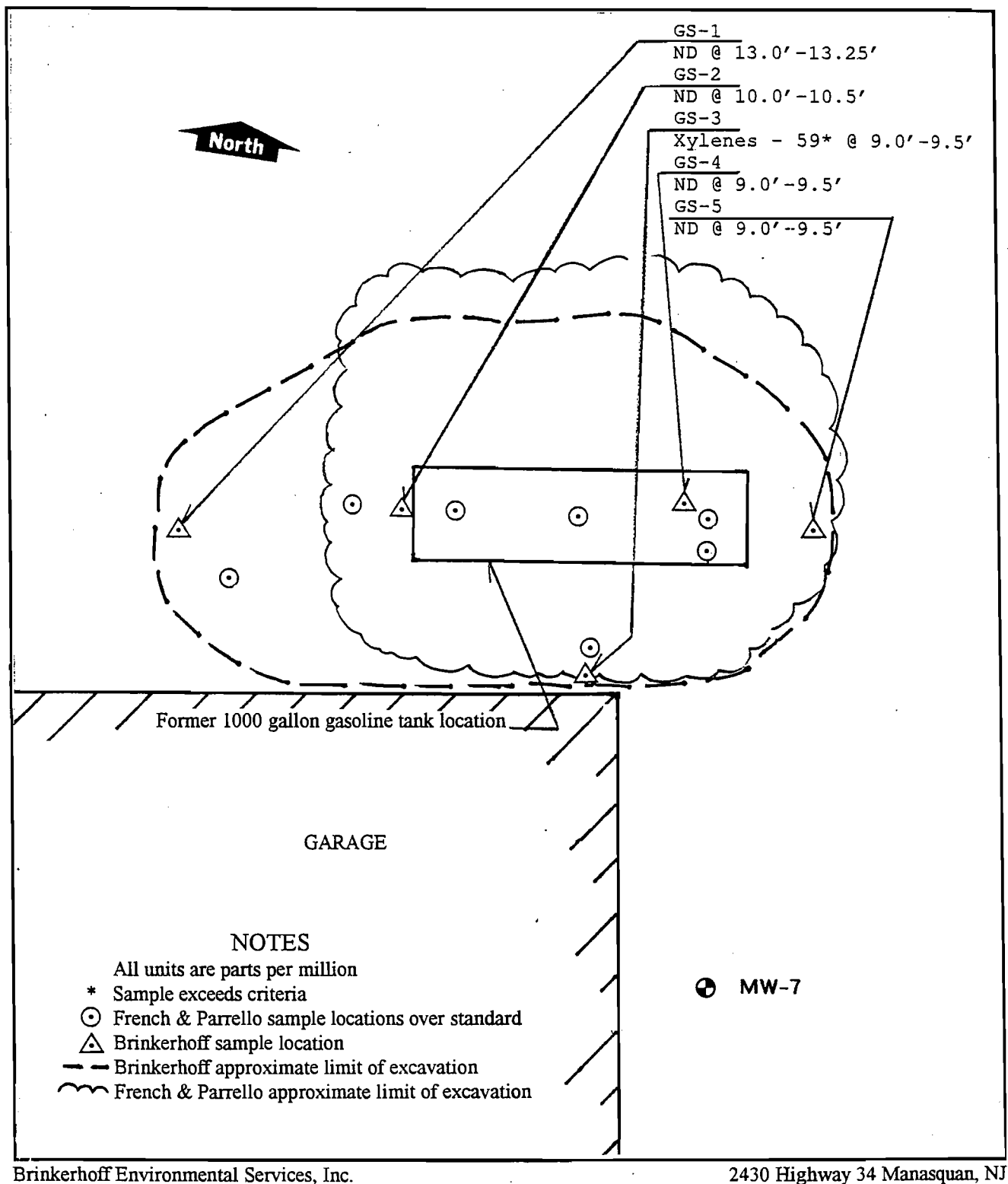


FIGURE 4-

SOIL SAMPLE LOCATIONS

Walnford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Scale: 1" = 5'

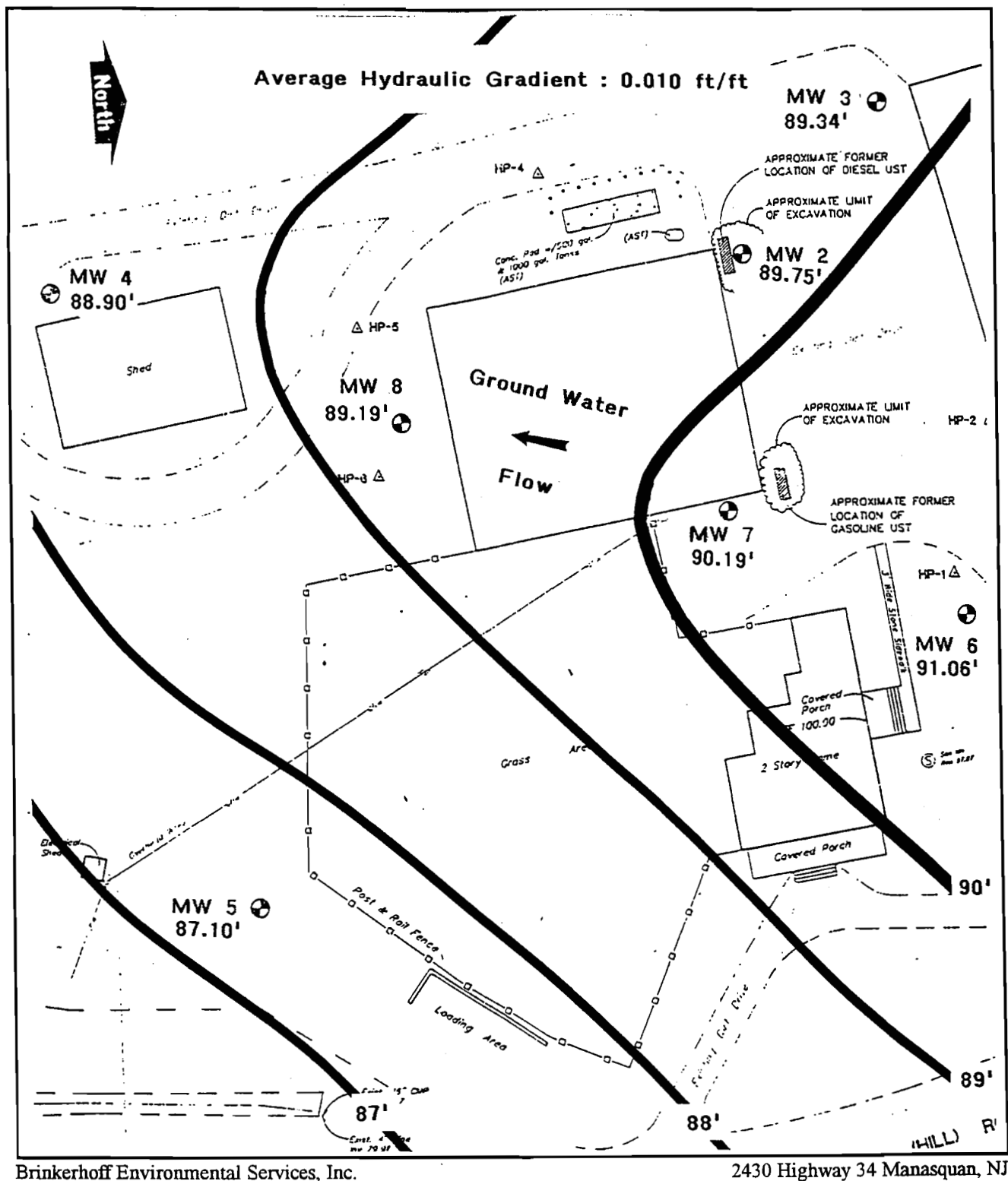


FIGURE 5-

GOUND WATER FLOW MAP
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 40'

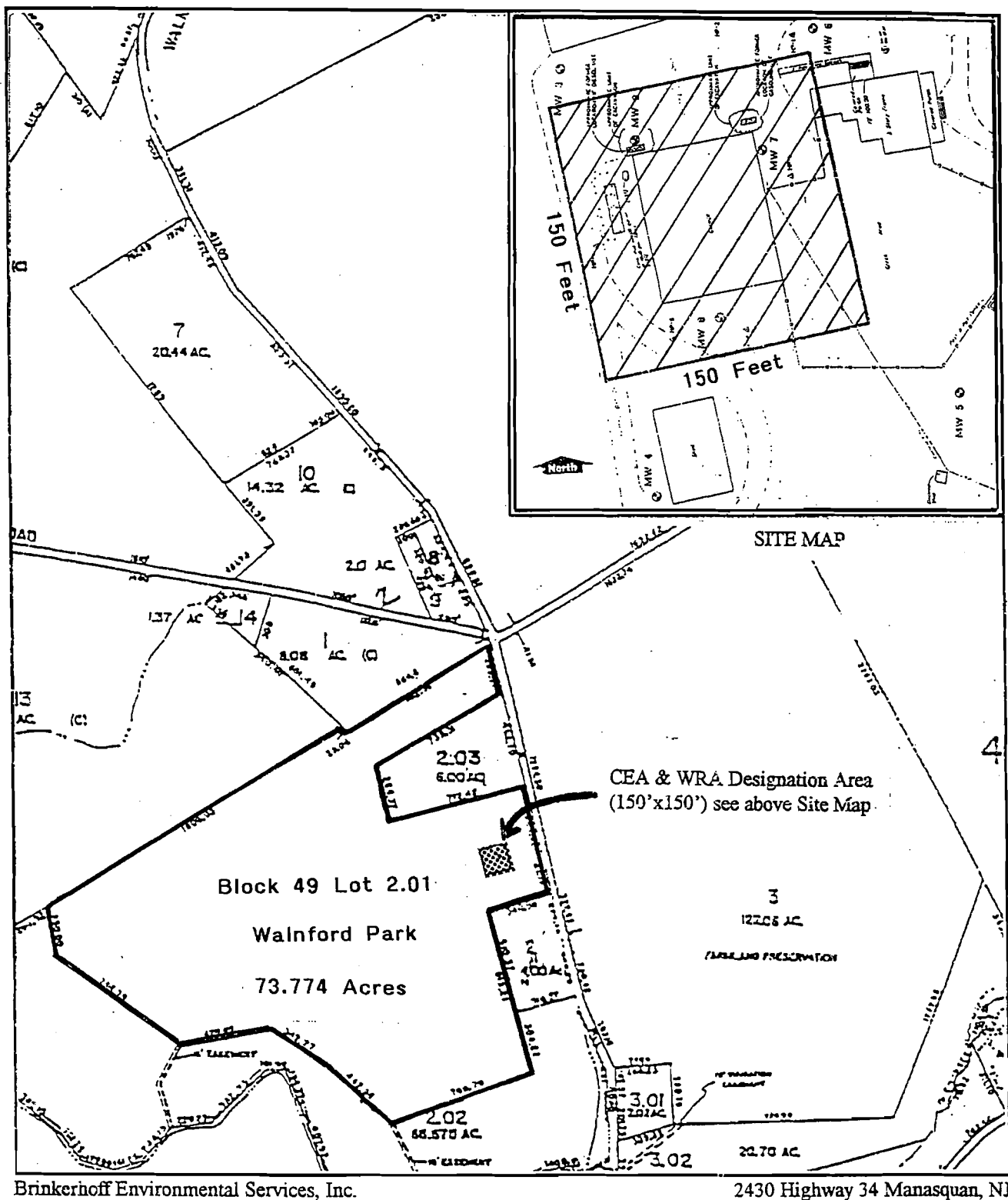


FIGURE 6- CLASSIFICATION EXCEPTION AREA DESIGNATION MAP

Walnford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Scale: 1" = 600'

REMEDIAL ACTION WORKPLAN ADDENDUM

FOR THE

MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD)
MONMOUTH COUNTY, NEW JERSEY

NJDEP CASE NO. 93-12-17-1452-46

NJDEP CASE NO. 93-12-17-1205-53

OCTOBER 1, 1998

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- Figure 2 - Soil Sample Locations
- Figure 3 - Soil Sample Locations
- Figure 4 - Ground Water Elevation and Flow Map (5/26/98)
- Figure 5 - Ground Water Flow Map

EXHIBITS

- Exhibit I - Field Data/Boring Logs
- Exhibit II - Soil Sampling Analytical Data
- Exhibit III - Laboratory Data Package
- Exhibit IV - Ground Water Sampling Results
- Exhibit V - CEA and WRA Designation Forms

REMEDIAL ACTION WORKPLAN ADDENDUM

for the

**Monmouth County Park System
Walnford Park Maintenance Building
Walns Mill (Hill) Road
Allentown (Upper Freehold), Monmouth County, New Jersey**

NJDEP Case No. 93-12-17-1452-46

NJDEP Case No. 93-12-17-1205-53

October 1, 1998

1.0 Introduction

On April 16, 1997, the New Jersey Department of Environmental Protection (NJDEP) completed the review of a Remedial Action Workplan (RAW) prepared for the Monmouth County Park System (MCPS) for two (2) underground storage tanks (USTs) at the Walnford Park Maintenance Facility. (See Figure 1.) The report prepared by Brinkerhoff Environmental Services, Inc. (BES) was conditionally approved as a Remedial Investigation Workplan (RIW).

The completed RIW served to outline additional investigative requirements to be completed by the MCPS. These additional requirements included the following: 1) delineation of the extent of impacted soil in the vicinity of the maintenance garage structure, 2) continued ground water monitoring, 3) revisions to the Classification Exception Area (CEA) application based on revised ground water monitoring results, and 4) additional investigation regarding an on-site potable water well located proximate to the impacted area.

2.0 Contaminated Soil Delineation

2.1 Former Gasoline UST

On February 3, 1998, BES collected additional soil samples directly south of the former gasoline underground storage tank (UST). Soil borings were completed from beneath the floor of the maintenance garage, as well as adjacent to the east wall of the maintenance garage. Soil borings were completed using a Geoprobe unit contracted from Diamond Drilling Co., Inc. All borings were continuously sampled using four-foot (4') long by two-inch (2") diameter sampling spoons. Sample spoons were screened at six-inch (6") intervals utilizing a photoionization detector (PID). One (1) sample from each boring exhibiting the highest PID reading was collected for laboratory analyses. Samples were collected in conformance with the NJDEP May 1992 *Field Procedures Sampling Manual* and the February 1997 *Methodology For The Field Extraction & Preservation Of Soil Samples With Methanol For Volatile Organic Compounds*. Relevant field data was recorded on Table 1 below and in Exhibit I.

Table 1
February 3, 1998 Soil Sampling Information

Sample	Date of Sample	Depth of Sample	Hnu Readings	Analysis
SD-1	2-3-98	9.5'-10.0'	7	VO+10
SD-2	2-3-98	4.0'-4.5'	60	VO+10
SD-3	2-3-98	5.5'-6.0'	925	VO+10
SD-5	2-3-98	5.5'-6.0'	1275	VO+10
SD-6	2-3-98	5.5'-6.0'	1900	VO+10

PID readings in meter units.

Three (3) soil samples were collected from 5.5 feet - 6.0 feet below grade at Soil Boring Locations SD-3, SD-5 and SD-6. Collected soil samples were placed in a cooler on ice, transported to BES' office, placed in a designated refrigerator for pickup by Accredited Laboratories, Inc. (Accredited) (NJDEP #12007), and analyzed for volatile organics using EPA Method 8240 VO+10 calibrated for xylenes. Soil sampling results are summarized in Table 2 below and Figure 2. The soil sampling analytical data package is provided in Exhibit II.

Soil Sample SD-3 exhibited contaminant concentrations below the cleanup standards. Soil Samples SD-5 and SD-6 reported benzene and total xylenes exceeding cleanup criteria. Soil samples were not collected below the six-foot (6') depth interval because of the presence of ground water. Soils became moist to wet between five feet (5') and six feet (6') below grade. Samples screened from below six feet (6') demonstrated a significant decrease in PID readings.

Table 2
Soil Sampling Results
February 3, 1998

Sample	Benzene	Toluene	Ethylbenzene	Xylenes
SD-1	ND	ND	ND	ND
SD-2	ND	1.5	ND	ND
SD-3	ND	0.23	0.31	2.2
SD-5	2.5	31	15	94
SD-6	3.6	26	6.3	37
*NJDEP	1	1,000	100	90**

Concentrations reported in parts per million (ppm); *NJDEP - Impact to Ground Water Soil Cleanup Criteria; ND - Compound not detected; Note - Methylene Chloride, a common lab contaminate, was detected in Samples SD-1, SD-2, SD-3, SD-5, and SD-6. ** Proposed cleanup criteria for xylenes

2.2 Former Diesel UST

On February 3, 1998, BES completed additional soil sampling, Samples SD-1 and SD-2 in the vicinity of the former diesel UST. (See Figure 3.) Soil Boring SD-1 was completed beneath the invert of the former diesel UST to delineate the vertical extent of impacted soil beneath the former UST location. Soil Boring SD-2 serves to determine the horizontal extent of impacted soils. Soil borings were completed using a Geoprobe unit. All borings were continuously sampled using a four-foot (4') long by two-inch (2") diameter sampling spoon. Collected sample spoons were screened at six-inch (6") intervals utilizing a Photoionization detector (PID). One (1) sample from each boring was collected for laboratory analyses. All analytical samples were collected in conformance with the NJDEP May 1992 *Field Procedures Sampling Manual* and the February 1997 *Methodology For The Field Extraction & Preservation Of Soil Samples With Methanol For Volatile Organic Compounds*. Relevant field data was recorded and summarized in Table 1 and as Boring Logs in Exhibit I.

A total of two (2) soil samples were collected from the diesel UST area, SD-1, 9.5 feet (9.5') to 10 feet (10') below grade and SD-2, 4.0 feet (4.0') to 4.5 (4.5') below grade. Collected soil samples were placed in a cooler on ice, returned to BES' office, placed in a designated refrigerator for pickup by Accredited, and analyzed for volatile organics using EPA Method 8240 VO+10 calibrated for xylenes. Soil sampling results are summarized in Table 2 and Figure 3. The analytical data package is provided in Exhibit II.

Soil Samples SD-1 and SD-2 exhibited contaminant concentrations below NJDEP cleanup standards. Soil samples collected on February 3, 1998, as well as previously-collected soil samples outlined in the November 8, 1996 RAW indicate that the previously-elevated volatile organic contamination have either degraded to below cleanup criteria or represent a de minimus quantity. BES recommends no further remedial action at the former diesel UST area.

3.0 Ground Water

3.1 Ground Water Monitoring

Ground water monitoring was completed at the site on February 13, 1998 and May 26, 1998. Ground water monitoring included the collection of water level data, as well as the collection of ground water samples at Monitoring Wells MW-2 and MW-7 on February 13, 1998 and MW-7 on May 26, 1998.

Ground water gauging was completed at all monitoring wells on the above-referenced dates. Data is summarized in Table 3 below. Ground water elevation contour maps were generated from the May 26, 1998 collected ground water gauging data. (See Figure 4.) The direction of ground water flow is toward the southeast. A southeastern flow direction is consistent with past flow directions.

Table 3
Well Gauging Data
February 13, 1998 and May 26, 1998

Monitoring Well	Date	Total Well Depth	TOCE	Depth to Water	Water Table Elevation
MW-2	5-26-98	17.5	96.03	5.94	90.09
	2-13-98	17.5	96.03	6.04	89.99
	8-6-96	17.5	96.03	6.28	89.75
MW-3	5-26-98	15.0	93.37	4.04	89.33
	2-13-98	15.0	93.37	3.88	89.49
	8-6-96	15.0	93.37	NM	NM
MW-4	5-26-98	15.0	91.27	2.74	88.53
	2-13-98	15.0	91.27	2.13	89.14
	8-6-96	15.0	91.27	2.82	88.90
MW-5	5-26-98	15.0	92.83	5.51	87.32
	2-13-98	15.0	92.83	5.50	87.33
	8-6-96	15.0	92.83	5.73	87.10
MW-6	5-26-98	15.0	96.25	5.15	91.10
	2-13-98	15.0	96.25	5.25	91.00
	8-6-96	15.0	96.25	NM	NM
MW-7	5-26-98	17.9	95.02	4.06	90.96
	2-13-98	17.9	95.02	4.42	90.60
	8-6-96	17.9	95.02	4.83	90.19
MW-8	5-26-98	18.5	92.40	2.68	89.72
	2-13-98	18.5	92.40	2.73	89.67
	8-6-96	18.5	92.40	3.21	89.19

All measurements are in feet unless otherwise noted; TOCE – Top Of Casing Elevation

3.2 Ground Water Sampling and Analysis

On February 13, 1998, Monitoring Wells MW-2, MW-7, and MW-8 were sampled. The site was revisited on May 26, 1998 and a sample was collected from Monitoring Well MW-7. All ground water sampling was completed in accordance with procedures outlined in the NJDEP's May 1992 *Field Procedures Sampling Manual*. Field parameters of pH, temperature, conductivity and dissolved oxygen were collected prior to well purging and after sample collection. Collected field parameters are presented in Table 4 below.

Collected ground water samples were placed in a cooler on ice, transported to BES' office, placed in a designated refrigerator for pickup by Accredited and analyzed for volatile organic compounds including a forward library search (VO+10) calibrated for xylenes. Analytical results are summarized in Table 5 below. The laboratory data package is in Exhibit III.

The analytical results of the February 13, 1998 and May 1998 ground water sampling events indicate the presence of targeted volatile organic compounds in Monitoring Well MW-7. The February 13, 1998 sample round indicated nondetectable levels of targeted volatile organic compounds in MW-8. Monitoring Well MW-8 was not sampled in May of 1998.

The concentration of volatile organic compounds, including benzene, decreased significantly between February of 1998 and May of 1998. A continuously decreasing trend is evident when the August 1996 sample results are included. It should also be noted that water levels have not fluctuated significantly, indicating that changes in water levels are not influencing the decrease in volatile concentrations. Based on the sampling results, the remedial action conducted was effective in reducing contaminate levels to where natural attenuation is occurring.

Table 4
Field Readings
February 13, 1998 and May 26, 1998

Well #	Date	Prior to Excavation				Subsequent to Sampling			
		PH	Temp °C	Cond.(mV)	D.O.	PH	Temp °C	Cond.(mV)	D.O.
MW-2	5-26-98	-	-	-	-	-	-	-	-
	2-13-98	6.8	7.9	257	3.9	6.6	8.6	149	2.5
MW-7	5-26-98	6.2	18.7	60.3	4.3	6.4	18.4	70.4	4.1
	2-13-98	5.4	8.9	268	3.1	5.5	9.6	139	6.0
MW-8	5-26-98	-	-	-	-	-	-	-	-
	2-13-98	6.4	9.5	490	5.0	5.7	9.3	320	5.6

Table 5
Summary Of Ground Water Sampling Results
(Results in parts per billion)

Monitor Well	Sample Date	Benzene	Ethyl-benzene	Toluene	Total Xylenes	MTBE
MW-1	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed
	4-17-95	11,000	600	8,900	3,700	9,200
	3-28-95	9,900	790	8,700	4,000	10,000
MW-2	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	NT	NT	NT	NT	NT
	3-28-95	ND	ND	ND	ND	ND
MW-3	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-4	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-5	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	0.9	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-6	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-7	5-26-98	23	1.3	0.9	3.6	ND
	2-13-98	40	10	2.2	7.1	150
	8-6-96	110	19	45	47	ND
MW-8	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
Potable	2-13-98	ND	ND	ND	ND	ND
	NJDEP Std	1	700	1,000	40	700

*NJDEP Std. – NJDEP Class II-A Ground Water Quality Standards; ND – Compound not detected above the method detection limit; D - indicates results based on a dilution; MTBE – Methyl *tert*-butyl ether; DTW – Depth to water; NS – Denotes well not sampled.

4.0 Aquifer Characteristics and Classification Exception Area Application Revision

4.1 Hydraulic Gradient

On August 6, 1996, prior to well purging and sampling, five (5) on-site monitoring wells, MW-2, MW-4, MW-5, MW-7, and MW-8, were gauged and all measurements recorded. Field data was later compiled and ground water elevation contour maps with flow directions were constructed. The average ground water table gradient was then calculated from the collected data. The average ground water table gradient on August 6, 1998 was determined to be 0.010 feet per foot (ft/ft).

4.2 Hydraulic Conductivity

To evaluate hydraulic conductivity, BES field personnel conducted aquifer slug testing on Monitoring Wells MW-7 and MW-8. A volume of water was removed from each well using a dedicated stainless steel bailer while monitoring changes in static water level over time using a Hermit Data Logger. A quantitative hydrogeologic assessment of the data was performed using the AQTESOLV ground water modeling program. The slug test data was analyzed using the Bouwer and Rice method for unconfined aquifers. Hydraulic conductivity and ground water and pollutant transport rates were calculated using the slug test data and AQTESOLV modeling calculations. Slug test data reduction determined hydraulic conductivity of 0.000092454 feet per minute.

4.3 Ground Water Velocity

The rate of ground water movement in the area of concern was determined using the ground water velocity equation derived from a combination of Darcy's law and the velocity equation of hydraulics. Ground water velocity was then expressed as:

$$V_s = K \times i / n_e$$

Where:

V_s = seepage velocity

K = hydraulic conductivity (calculated from slug test data)

i = hydraulic gradient (calculated from ground water flow data)

n_e = effective porosity (assumed at 35%)

$\times$ = multiplication symbol

Ground water velocity in the area of concern was then calculated:

$$V_s = 0.000092454 \text{ ft/min} \times 0.010 \text{ ft/ft} / 0.35$$

$$V_s = 0.000002642 \text{ or } 1.39 \text{ ft/yr.}$$

Assuming a porosity of 35 percent (35%) and a calculated hydraulic gradient of 0.01 ft/ft obtained from the August 6, 1996 ground water contour map, ground water velocity is determined to be 1.39 feet (1.39') per year (ft/yr).

4.4 Pollutant Transport Rate

Applying a pollutant transport rate calculation to the ground water velocity rate, calculated above, the following retardation factor is derived:

$$R_d = 1 + (KOC \times foc \times pb/ne)$$

Where:

R_d = retardation factor

KOC = soil sorption coefficient (63 - standard benzene coefficient)

foc = fraction of organic carbon (assumed at 0.005)

pb = bulk density (assumed at 1.5 g/ml.)

ne = effective porosity (assumed at 35%)

The retardation factor is then calculated:

$$R_d = 1 + (63 \times 0.005 \times 1.5/0.35)$$

$$R_d = 2.35$$

The pollutant (benzene) transport rate is then calculated as follows:

$$V_{pt} = V/R_d$$

$$V_{pt} = 1.39 \text{ ft/yr.}/2.35$$

$$V_{pt} = 0.59 \text{ ft/yr.}$$

Using this formula, assuming a bulk density of 1.5 grams per milliliter, a fraction of organic carbon content of 0.5 percent (0.5%) and a porosity of 35 percent (35%), the benzene transport rate is calculated to be approximately 0.59 ft/yr.

4.5 Benzene Half-Life

The original CEA calculations included in the November 8, 1998 RAW included water quality data obtained from Monitoring Well MW-1. Monitoring Well MW-1 was destroyed during remedial activities and, therefore, is not representative of current site conditions. Benzene half-life was calculated from water quality data obtained from Monitoring Well MW-7.

Benzene Half-Life:

$$\frac{1}{2} \text{ Life} = 0.693 \times \text{Change in time} / \ln (C/Co)$$

Where:

Change in time = date of initial sampling to date of most recent sampling
of well MW-1 (8/6/96 to 5/26/98)

C = initial benzene concentration (MW-7)

Co = most recent benzene concentration (MW-7)

0.693 = standard coefficient for half-life calculation

ln = natural log

x = multiplication symbol

$\frac{1}{2}$ Life = $0.693 \times 641 \text{ days} / \ln (110 \text{ ppb}/23 \text{ ppb})$

$\frac{1}{2}$ Life = 284 days

Duration to reach NJDEP Ground Water Quality Standards:

<u>Number of Days</u>	<u>Benzene Concentration</u>
0	23
284	11.5
568	5.75
852	2.875
1136	1.4375
1309	1
1420	0.71875

Duration of CEA = 1,309 days or 3.59 years

Length of CEA = 3.59 years x Vpt
= 3.59 years x 0.59 ft/yr
= 2.12 ft

Based on the benzene transport rate calculated above, a benzene half-life of 284 days and an initial benzene concentration of 110 ppb (August 7, 1996), dissolved benzene concentrations are expected to naturally degrade to one (1) ppb within approximately 3.59 years and 2.12 feet (2.12') downgradient of MW 7.

A CEA and WRA designation is requested, using natural remediation, for a duration of five (5) years and cover an area of 100 feet by 100 feet of Pine Brook Golf Course as depicted on Figure 7 - Classification Exception Area Designation Map. Numerical modeling demonstrates the CEA need only be placed 28.56 feet (28.56') downgradient of MW 6. CEA and WRA designation forms are included in Exhibit V and an application is presented below.

4.6 Classification Exception Area Application and Well Restriction Area Application

A CEA and WRA are being proposed for a portion of Lot 2, Block 427.01, Englishtown, New Jersey. The area totals approximately 33 acres, as depicted on Figure 7 (CEA Map). The CEA and WRA would restrict the use of the shallow water table aquifer within this area. Irrigation and/or potable wells that produce from the shallow water table aquifer could not be installed within this lot.

The CEA and WRA would be in place for five (5) years, which would provide sufficient time to allow benzene concentrations to degrade to below the NJDEP Class II-A GWQS of one (1.0) ppb. Assuming a benzene half-life of 284 days, and an initial benzene concentration of 23 ppb (May 26, 1998), benzene concentrations should continue to degrade to below 1.0 ppb, through natural attenuation, in approximately 3.59 years from the most recent sampling round (May 25, 1998), taking into account varying geology, hydrogeology and degradation variables.

A five (5) year CEA should allow for the variations in subsurface conditions, which affect the natural remediation process, and provide adequate time for natural remediation to occur. The CEA would apply to the petroleum-related compounds detected in the ground water at the Pine Brook Golf Course site.

5.0 Receptor Evaluation

BES further investigated the presence of the on-site potable well which provides water to a house which is located 35 feet east of the maintenance garage area and is part of the Walnford Park complex. (See Figure 1.) Well searches conducted with the NJDEP and the Monmouth County Department of Health have not been able to recover well logs and, therefore, cannot determine the required well completion data. MCPS officials are, however, able to place the potable well on the north side of the house structure in the vicinity of MW-6.

The depth of the potable well is projected to be greater than 40 feet. (See Section 3.1 of the November 1998 RAW.) The Marshalltown Formation, a nonwater-bearing formation, outcrops in the area. Drillers' logs in the area indicate that the Marshalltown Formation is between 30 feet and 40 feet thick in the area. The potable well likely produces from the underlying Englishtown Formation.

The potable water well is reported to exist sidegradient of the former gasoline UST contaminated ground water plume. The potable ground water well was sampled during the February 13, 1998 site visit. The collected potable water well sample was submitted to Accredited Laboratories for volatile organic compound analysis utilizing EPA Method 524 VO+10 calibrated to xylenes. The sampling results of the potable well indicated no detectable concentrations of volatile organic compounds. (See Table 5 and Exhibit IV.)

6.0 Conclusions and Recommendations

Based on information summarized in this report, BES recommends natural attenuation at the Walnford Park site. Site specific ground water sampling results indicate that natural attenuation is ongoing and is an effective remedial option. In addition the combination of a limited extent of impacted ground water, a slow migration rate, the presence of a low permeability soil type, the removal of the source, and a lack of potential receptors in the area all support the natural attenuation option. BES recommends the implementation of the CEA.

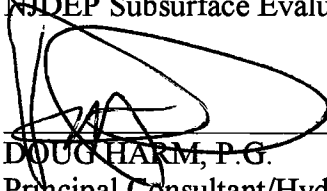
Soil sampling results in the location of the former diesel UST were below cleanup guidelines. Soil sampling results surrounding the former gasoline UST indicate a de minimus quantity-contaminated soil exists; however, is not impacting the ground water quality. Monitoring Well MW-7 downgradient of the gasoline UST has demonstrated a decreasing trend of volatile organic compounds.

Current and potential ground water users within the proposed CEA areas are not expected to change during the coverage of the CEA duration of five (5) years. One potable well is in use adjacent to the CEA area. The shallow aquifer (Marshalltown Formation), which is the aquifer affected by the discharge, is not considered a water bearing zone. Potable water is obtained from the deeper Englishtown Formation at a depth of between 70 feet and 90 feet. Ground water samples collected from the on-site potable water well demonstrate that volatile organic compounds are not present in the potable well.

This report was prepared and is respectfully submitted by

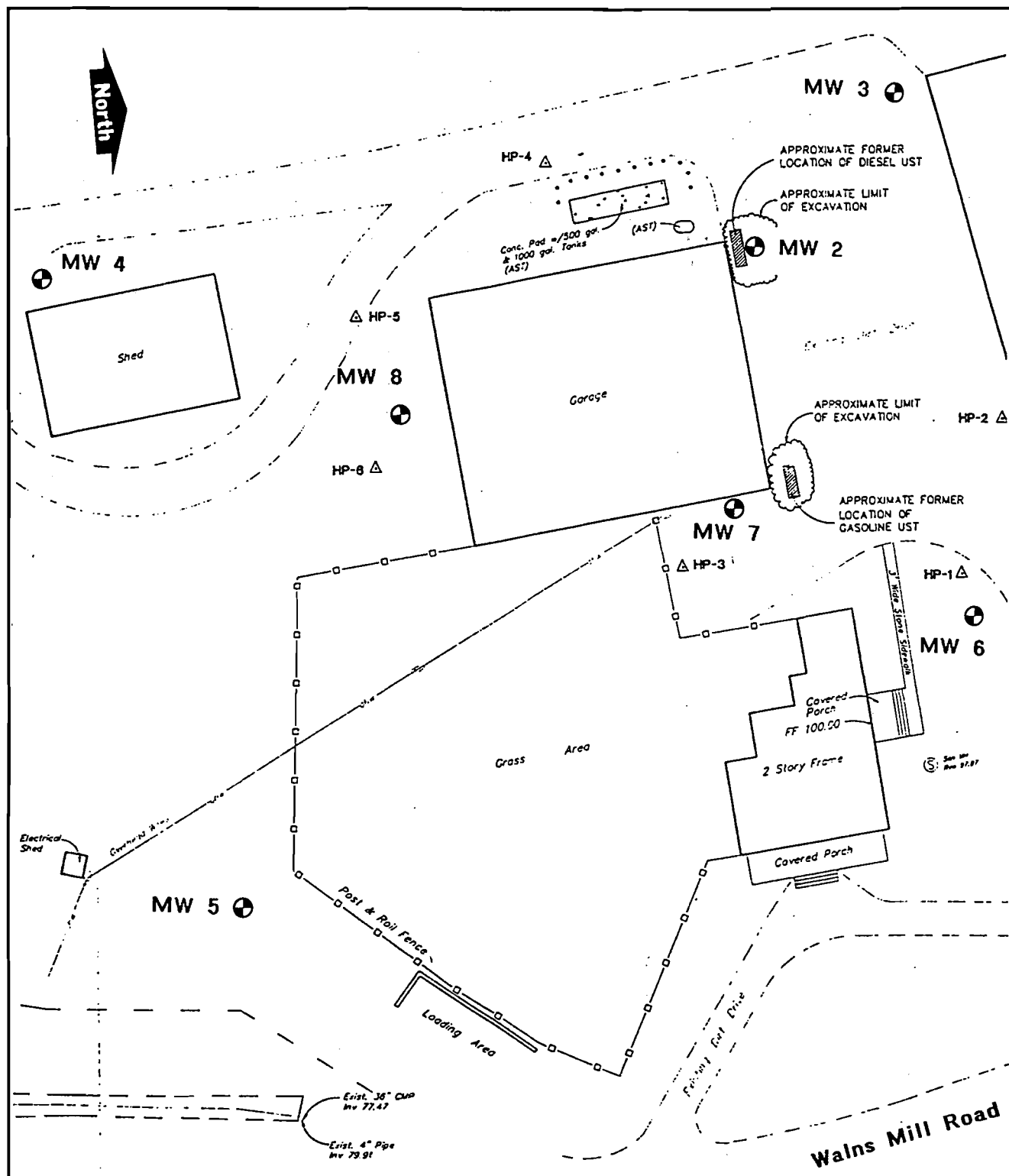
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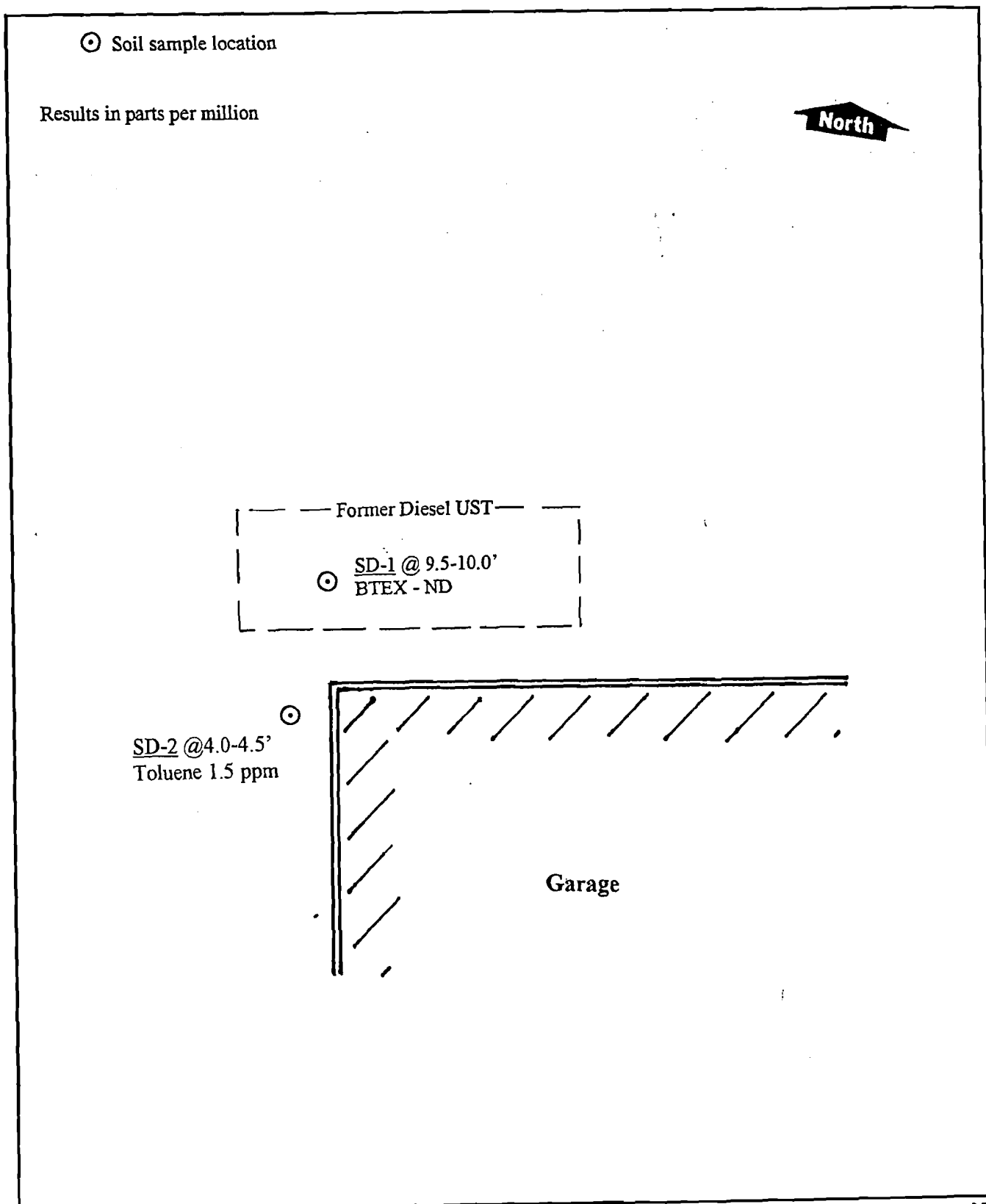


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FIGURE 1

SITE MAP
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 40'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 2

SOIL SAMPLE LOCATIONS

Walnford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Scale: 1" = 5'

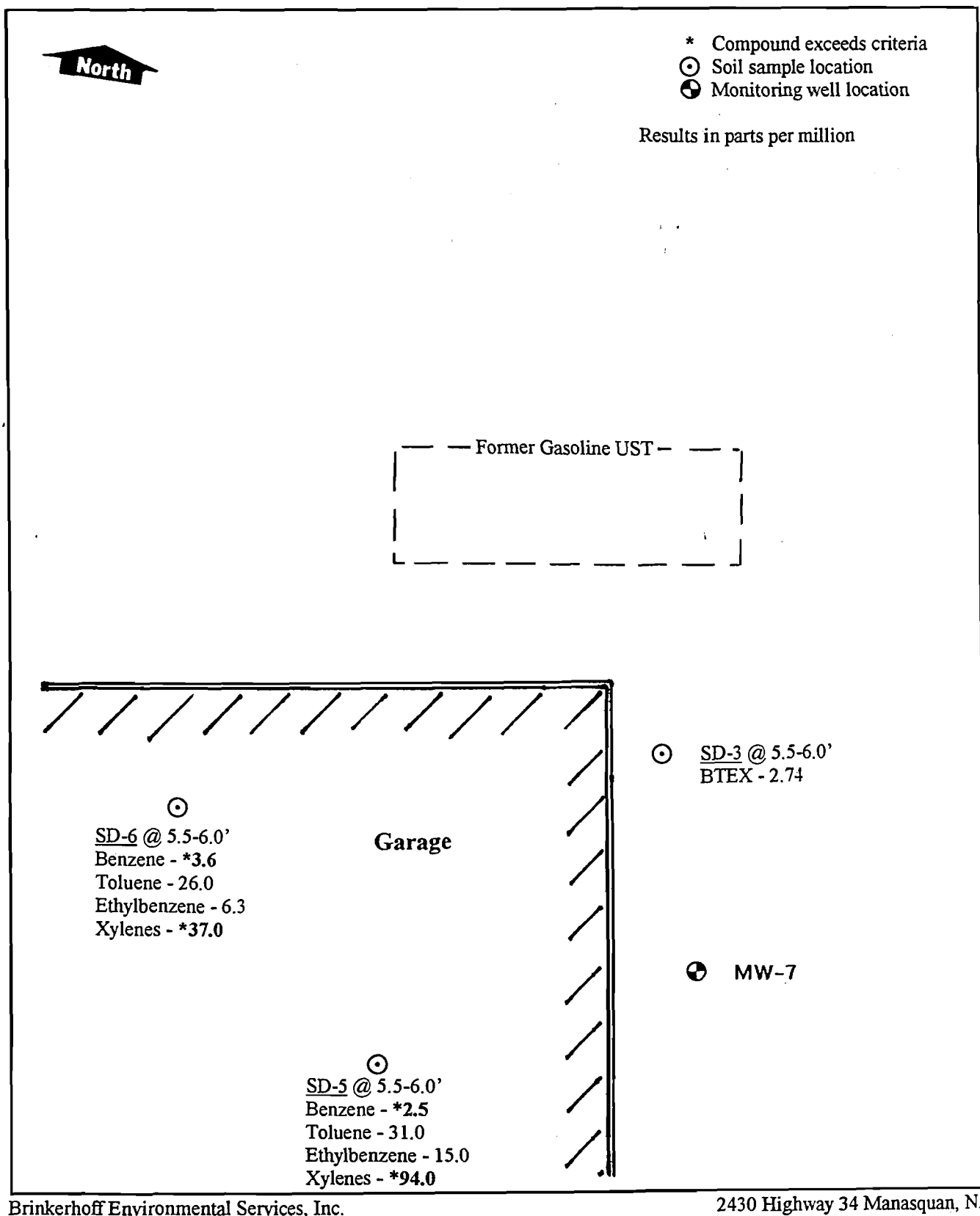
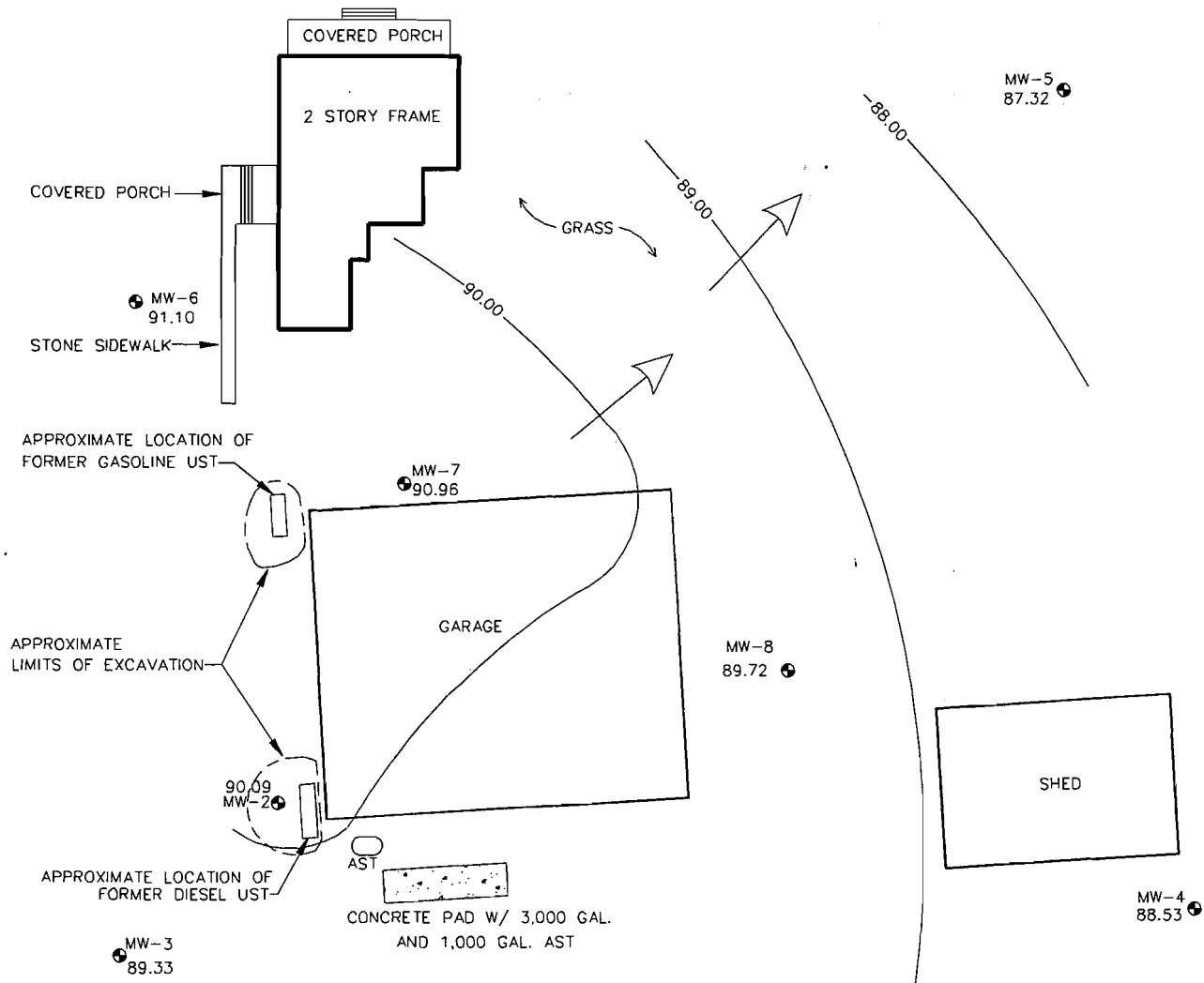


FIGURE 3

SOIL SAMPLE LOCATIONS
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 5'

NORTH



LEGEND

- MONITORING WELL LOCATION
- GROUND WATER FLOW DIRECTION
- CONTOUR INTERVAL = 1.0 FEET
- 89.00 — GROUND WATER LEVEL CONTOUR

BRINKERHOFF

A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 4- GROUND WATER ELEVATION AND FLOW MAP (5-26-98)
WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLETOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

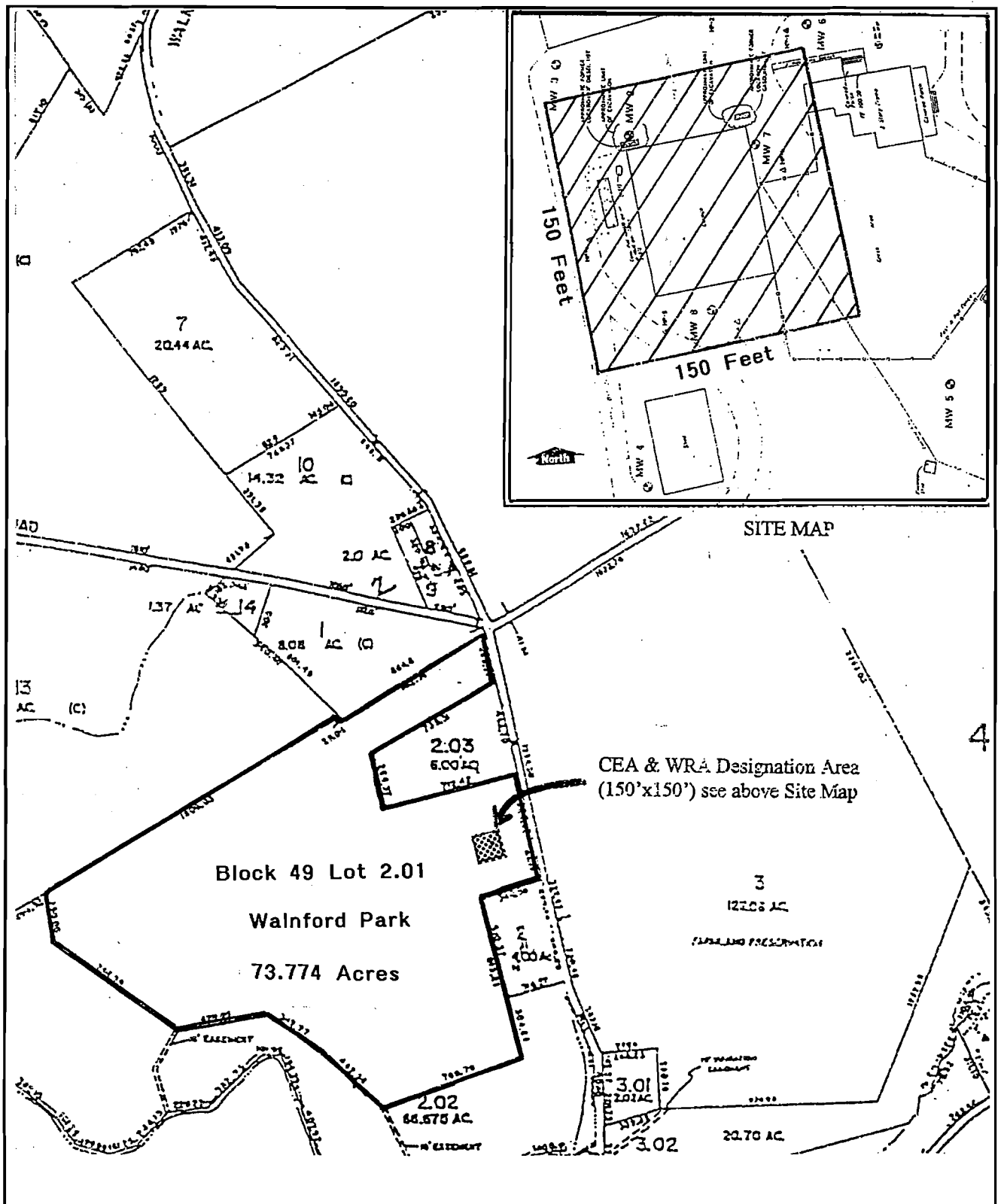
9-11-98

JOB NO.:

96106D

SCALE:

1" = 40'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 5

GROUND WATER FLOW MAP
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 5'

REMEDIAL ACTION WORKPLAN ADDENDUM

for the

**MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD)
MONMOUTH COUNTY, NEW JERSEY**

NJDEP Case No. 93-12-17-1452-46

NJDEP Case No. 93-12-17-1205-53

June 25, 1999

REMEDIAL ACTION WORKPLAN ADDENDUM

MONMOUTH COUNTY PARK SYSTEM WALNFORD PARK MAINTENANCE BUILDING

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REMEDIAL ACTION WORKPLAN ADDENDUM

MONMOUTH COUNTY PARK SYSTEM WALNFORD PARK MAINTENANCE BUILDING

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- Figure 1 – Site Location Map/Topographic Map
- Figure 2 – Soil Boring Locations
- Figure 3 – Site Map
- Figure 4 – Groundwater Elevation and Flow Map (6/10/99)
- Figure 5 – CEA/WRA Designation Map

EXHIBITS

- Exhibit I - Soil Boring Logs
- Exhibit II - Laboratory Analytical Data (Soil) – March 16, 1999
- Exhibit III - Well Permit Information and Well Logs
- Exhibit IV - Monitoring Well Sampling Data Forms
- Exhibit V - Laboratory Analytical Data (Groundwater) – March 30, 1999
- Exhibit VI - Classification Exception Area (CEA) and
Well Restriction Area (WRA) Designation Forms
- Exhibit VII - Laboratory Analytical Data (Potable Well) – February 13, 1998

REMEDIAL ACTION WORKPLAN ADDENDUM

for the

MONMOUTH COUNTY PARK SYSTEM WALNFORD PARK MAINTENANCE BUILDING WALNS MILL (HILL) ROAD ALLENTOWN (UPPER FREEHOLD) MONMOUTH COUNTY, NEW JERSEY

NJDEP Case No. 93-12-17-1452-46

NJDEP Case No. 93-12-17-1205-53

June 25, 1999

1.0 INTRODUCTION

On December 17, 1998, the New Jersey Department of Environmental Protection (NJDEP) completed the review of a Remedial Action Workplan (RAW) prepared for the Monmouth County Park System (MCPS) for two (2) underground storage tanks (USTs) at the Walnford Park Maintenance Facility. (See Figure 1.) The report prepared by Brinkerhoff Environmental Services, Inc. (BES) was conditionally approved as a Remedial Investigation Workplan (RIW).

The completed RIW served to outline additional investigative requirements to be completed by the MCPS. These additional requirements included the following:

1. Delineation of the extent of impacted soil associated with the former gasoline UST in the vicinity of the maintenance garage structure;
2. Continued groundwater monitoring;
3. Revisions to the Classification Exception Area (CEA) Application based on revised groundwater monitoring results; and
4. Additional investigation regarding an on-site potable water well located proximate to the impacted area.

2.0 CONTAMINATED SOIL DELINEATION

2.1 Former Gasoline UST

On March 16, 1999, BES completed additional soil borings and collected soil samples to delineate the extent of petroleum-impacted soils identified during postexcavation soil sampling and the February 3, 1998 soil boring survey. The source of the petroleum impact is the former 1,000-gallon gasoline UST which was removed in December of 1993. Three (3) soil borings were completed beneath the floor of the maintenance garage structure. Soil borings were completed using a concrete coring machine and stainless steel hand augers. All borings were screened in six-inch (6") intervals for the presence of volatile organic compounds (VOCs). Field-screening included the use of a photoionization detector (PID) visual evaluation for the presence or absence of free-phase petroleum and for the presence or absence of petroleum odors. One (1) sample from each boring exhibiting the highest PID reading was collected for laboratory analysis. All of the soil samples were collected above the groundwater table. Samples were collected in conformance with the NJDEP's May 1992 *Field Procedures Sampling Manual* and the February 1997 *Methodology For The Field Extraction & Preservation Of Soil Samples With Methanol For Volatile Organic Compounds*. Relevant field data was recorded on Table 1 below. Soil boring logs are provided in Exhibit I.

Table 1
Summary of Soil Sampling Field Measurements
March 16, 1999 Soil Boring Survey

Sample	Date of Sample	Depth of Sample	Hnu Readings	Analysis
SD-7	3-16-99	5.5'-6.0'	<1	VO+10
SD-8	3-16-99	5.5'-6.0'	<1	VO+10
SD-9	3-16-99	5.5'-6.0'	5	VO+10

PID readings in meter units.

Three (3) soil samples, SD-7 through SD-9, were collected from six (6) to six-and-a-half (6.5) feet below grade. Collected soil samples were placed in a cooler on ice, transported to BES' office, placed in a designated refrigerator for pickup by Accredited Laboratories, Inc. (Accredited) (NJDEP No. 12007), and analyzed for volatile organics using EPA Method 8240 VO+10 calibrated for xylenes. Soil sampling results for SD-7 through SD-9 are summarized in Table 2 which includes data from the February 3, 1998 sampling event. Soil boring locations are depicted in Figure 2. The soil sampling analytical data package for the March 16, 1999 soil sampling event are provided in Exhibit II.

VOCs, benzene and total xylenes were detected in Soil Sample SD-7. Detected concentrations of VOCs in Soil Sample SD-7 were below NJDEP Impact to Groundwater Soil Cleanup Guidelines. Targeted VOCs were not detected in Soil Samples SD-8 and SD-9. Soil sampling results have delineated the extent of petroleum-impacted soil.

Table 2
Soil Sampling Results
Impacted Soil Delineation, Former Gasoline UST
February 3, 1998 and March 16, 1999

Sample	Date Sampled	Sample Depth	Methylene Chloride	Benzene	Toluene	Ethylbenzene	Xylenes
SD-1	2-3-98	9.5-10.0	ND	ND	ND	ND	ND
SD-2	2-3-98	4.0-4.5	ND	ND	1.5	ND	ND
SD-3	2-3-98	5.5-6.0	ND	ND	0.23	0.31	2.2
SD-5	2-3-98	5.5-6.0	ND	2.5	31	15	94
SD-6	2-3-98	5.5-6.0	ND	3.6	26	6.3	37
SD-7	3-16-99	5.5-6.0	ND	0.93	ND	0.33 J	0.56
SD-8	3-16-99	5.5-6.0	0.70 B	ND	ND	ND	ND
SD-9	3-16-99	5.5-6.0	ND	ND	ND	ND	ND
*NJDEP			1	1	1,000	100	67**

Concentrations reported in parts per million (ppm);

*NJDEP – Impact to Groundwater Soil Cleanup Criteria;

ND – Compound not detected.

Note – Methylene Chloride, a common laboratory contaminant, was detected in Samples SD-1, SD-2, SD-3, SD-5, and SD-6.

J = Estimated Value; B = Compound found in blank; ** Proposed cleanup criteria for xylenes.

3.0 WELL INSTALLATION

On March 15, 1999, BES contracted Diamond Drilling Co, Inc. to install one (1) four-inch (4") diameter monitoring well within the former gasoline UST excavation. The newly-installed well was designated MW-9 and is intended to replace MW-1 which was destroyed during remedial excavation activities. The monitoring well was installed using hollow-stem augers. During monitoring well installation, well cuttings were logged at one-foot (1') intervals. The newly-installed monitoring well was designated MW-9. Monitoring Well MW-9 was screened from five (5) to 15 feet below grade. Following installation, the well's relative elevation and location were surveyed. The Monitoring Well Permit and Monitoring Well Record are provided as Exhibit III.

4.0 GROUNDWATER

4.1 Groundwater Monitoring

Groundwater monitoring was completed at the site on March 30, 1999. Groundwater monitoring included groundwater gauging and sampling. Monitoring well locations are presented in Figure 3.

Groundwater gauging was completed at all monitoring wells. Groundwater gauging data is summarized in Table 3. Groundwater elevation contour maps were generated from the March 30, 1999 gauging data. The groundwater elevation map is presented as Figure 4. The groundwater flow direction is predominantly toward the southeast and is consistent with past flow directions.

Table 3
Summary of Monitoring Well Gauging Data
August 6, 1996 through March 30, 1999
(Measurements in feet.)

Monitoring Well	Date	Total Well Depth	Top of Casing Elevation	Depth to Water	Water Table Elevation
MW-2	3-30-99	17.5	96.03	5.96	90.07
	5-26-98	17.5	96.03	5.94	90.09
	2-13-98	17.5	96.03	6.04	89.99
	8-6-96	17.5	96.03	6.28	89.75
MW-3	3-30-99	15.0	93.37	3.84	89.53
	5-26-98	15.0	93.37	4.04	89.33
	2-13-98	15.0	93.37	3.88	89.49
	8-6-96	15.0	93.37	NM	NM
MW-4	3-30-99	15.0	91.27	2.65	88.62
	5-26-98	15.0	91.27	2.74	88.53
	2-13-98	15.0	91.27	2.13	89.14
	8-6-96	15.0	91.27	2.82	88.90
MW-5	3-30-99	15.0	92.83	5.42	87.41
	5-26-98	15.0	92.83	5.51	87.32
	2-13-98	15.0	92.83	5.50	87.33
	8-6-96	15.0	92.83	5.73	87.10
MW-6	3-30-99	15.0	96.25	4.81	91.44
	5-26-98	15.0	96.25	5.15	91.10
	2-13-98	15.0	96.25	5.25	91.00
	8-6-96	15.0	96.25	NM	NM
MW-7	3-30-99	17.9	95.02	4.13	90.89
	5-26-98	17.9	95.02	4.06	90.96
	2-13-98	17.9	95.02	4.42	90.60
	8-6-96	17.9	95.02	4.83	90.19
MW-8	3-30-99	18.5	92.40	2.74	89.66
	5-26-98	18.5	92.40	2.68	89.72
	2-13-98	18.5	92.40	2.73	89.67
	8-6-96	18.5	92.40	3.21	89.19
MW-9	3-30-99	15.0	94.63	3.40	91.23

All measurements are in feet unless otherwise noted.

4.2 Groundwater Sampling and Analysis

On March 30, 1999, Monitoring Well MW-7 and the newly-installed MW-9 were sampled. Groundwater sampling was completed in accordance with procedures outlined in the NJDEP's May 1992 *Field Procedures Sampling Manual*. Field parameters of pH, temperature, conductivity and dissolved oxygen were collected prior to well purging and after sample collection. Collected field parameters are presented in Table 4 below. Monitoring Well Sampling Data Forms are provided as Exhibit IV.

Collected groundwater samples were placed in a cooler on ice, transported to BES' office, placed in a designated refrigerator for pickup by Accredited, and analyzed for VOCs, including a forward library search (VO+10) calibrated for xylenes. Analytical results are summarized in Table 5 below. The laboratory data package is provided as Exhibit V.

The analytical results of the March 30, 1999 groundwater sampling event indicate the presence of targeted VOCs in MW-7 and MW-9. NJDEP Class IIA Groundwater Quality Criteria were exceeded at MW-7 at a concentration of six (6) parts per billion (ppb). NJDEP Class IIA Groundwater Quality Criteria were exceeded at MW-9 for benzene at a concentration of 990 ppb.

The concentration of VOCs in MW-7, including benzene, decreased between May of 1998 and March of 1999. A continuously-decreasing trend is evident when the February 1998 and August 1996 sample results are included.

Groundwater samples collected from the newly-installed MW-9 can be compared with historic groundwater sampling results of the destroyed MW-1. Concentrations of targeted VOCs have decreased significantly since MW-1 was last sampled before its destruction during remedial soil excavation. Only benzene remains at concentrations which are above the NJDEP Class IIA Groundwater Quality Standards.

It should also be noted that water levels have not fluctuated significantly at the site, indicating that changes in water levels are not influencing the decrease in volatile concentrations. Based on the decreasing trends witnessed within the former gasoline UST excavation and MW-7, it can be concluded that the source of the impacted ground water has been eliminated and natural attenuation is ongoing.

Table 4
Summary of Field Readings
May 26, 1998

		Prior to Evacuation				Subsequent to Sampling			
Well #	Date	PH	Temp °C	Cond. (mV)	D.O. % Sat.	PH	Temp °C	Cond. (mV)	D.O. % Sat.
MW-7	3-30-99	5.6	12.8	62.1	27.6	5.5	12.8	86.1	35.8
MW-9	3-30-99	5.9	12.5	57.2	31.0	6.3	12.6	63.1	34.9

Table 5
Summary Of Groundwater Sampling Results
(Results in ppb.)

Monitoring Well	Sample Date	Benzene	Ethylbenzene	Toluene	Total Xylenes	MTBE
MW-2	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	NT	NT	NT	NT	NT
	3-28-95	ND	ND	ND	ND	ND
MW-3	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-4	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-5	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	0.9	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-6	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-7	3-30-99	6	1.2	ND	ND	15
	5-26-98	23	1.3	0.9	3.6	ND
	2-13-98	40	10	2.2	7.1	150
	8-6-96	110	19	45	47	ND
MW-8	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
MW-9	3-30-99	990	130	18	63	ND
MW-1	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed
	4-17-95	11,000	600	8,900	3,700	9,200
	3-28-95	9,900	790	8,700	4,000	10,000
Potable	2-13-98	ND	ND	ND	ND	ND
	NJDEP Std	1	700	1,000	40	700

*NJDEP Std. – NJDEP Class II-A Groundwater Quality Standards; ND – Compound not detected above the method detection limit; NA – Compound not analyzed; D - Indicates results based on a dilution; MTBE – Methyl *tert*-butyl ether; DTW – Depth to water; NS – Denotes well not sampled.

5.0 AQUIFER CHARACTERISTICS AND CLASSIFICATION EXCEPTION AREA REVISION

5.1 Hydraulic Gradient

On March 30, 1999, prior to well purging and sampling, five (5) on-site monitoring wells, MW-2, MW-4, MW-5, MW-7, and MW-8, were gauged and all measurements recorded. Field data was later compiled and groundwater elevation contour maps with flow directions were constructed. The average groundwater table gradient was then calculated from the collected data. The average groundwater table gradient on March 30, 1999 was determined to be 0.16 feet per foot (ft/ft).

5.2 Hydraulic Conductivity

To evaluate hydraulic conductivity, BES field personnel conducted aquifer slug testing on Monitoring Wells MW-7 and MW-8. A volume of water was removed from each well using a dedicated stainless steel bailer while monitoring changes in static water level over time using a Hermit Data Logger. A quantitative hydrogeologic assessment of the data was performed using the AQTESOLV groundwater modeling program. The slug test data was analyzed using the Bouwer and Rice method for unconfined aquifers. Hydraulic conductivity and groundwater and pollutant transport rates were calculated using slug test data and AQTESOLV modeling calculations. Slug test data reduction determined hydraulic conductivity of 0.000092454 feet per minute. Aquifer slug testing data is included in the November 6, 1996 Remedial Action Workplan.

5.3 Groundwater Velocity

The rate of groundwater movement in the area of concern was determined using the groundwater velocity equation derived from a combination of Darcy's law and the velocity equation of hydraulics. Groundwater velocity was then expressed as:

$$V_s = K \times i / ne$$

Where:

V_s = seepage velocity

K = hydraulic conductivity (calculated from slug test data)

i = hydraulic gradient (calculated from groundwater flow data)

ne = effective porosity (assumed at 35%)

$\times$ = multiplication symbol

Groundwater velocity in the area of concern was then calculated:

$$V_s = 0.000092454 \text{ ft/min} \times 0.010 \text{ ft/ft} / 0.35$$
$$V_s = 0.000002642 \text{ or } 1.39 \text{ ft/yr.}$$

Assuming a porosity of 35 percent (35%) and a calculated hydraulic gradient of 0.016 ft/ft obtained from the March 30, 1999 groundwater contour map, groundwater velocity is determined to be 2.37 feet (2.37') per year (ft/yr).

5.4 Pollutant Transport Rate

Applying a pollutant transport rate calculation to the groundwater velocity rate, calculated above, the following retardation factor is derived:

$$R_d = 1 + (KOC \times foc \times pb/ne)$$

Where:

R_d = retardation factor

KOC = soil sorption coefficient (.63- standard benzene coefficient)

foc = fraction of organic carbon (assumed at 0.005)

pb = bulk density (assumed at 1.5 g/ml.)

ne = effective porosity (assumed at 35%)

The retardation factor is then calculated:

$$R_d = 1 + (0.63 \times 0.005 \times 1.5/0.35)$$
$$R_d = 1.014$$

The pollutant (benzene) transport rate is then calculated as follows:

$$V_{pt} = V/R_d$$
$$V_{pt} = 2.37 \text{ ft/yr.}/1.014$$
$$V_{pt} = 2.341 \text{ ft/yr.}$$

Using this formula, assuming a bulk density of 1.5 grams per milliliter, a fraction of organic carbon content of 0.5 percent (0.5%) and a porosity of 35 percent (35%), the benzene transport rate is calculated to be approximately 0.2.341 ft/yr.

5.5 Benzene Half-Life

Monitoring Well MW-1 was located within the gasoline UST excavation. MW-1 was destroyed during remedial activities and replaced in March of 1999 with MW-9. Groundwater sampling data obtained from MW-1 and MW-9 are not as consistent as groundwater sampling data obtained from MW-7. MW-7 was used to calculate a benzene half-life for the site.

Benzene Half-Life:

$$\frac{1}{2} \text{ Life} = 0.693 \times \text{Change in time} / \ln (C/Co)$$

Where:

Change in time = date of initial sampling to date of most recent sampling
of Well MW-7 (8/6/96 to 3/3/90)

C = initial benzene concentration (MW-7)

Co = most recent benzene concentration (MW-7)

0.693 = standard coefficient for half-life calculation

ln = natural log

x = multiplication symbol

$$\frac{1}{2} \text{ Life} = 0.693 \times 641 \text{ days} / \ln (110 \text{ ppb}/6 \text{ ppb})$$

$$\frac{1}{2} \text{ Life} = 225 \text{ days}$$

5.6 Duration to Reach NJDEP Groundwater Quality Standards

Monitoring Well MW-9 is located within the former gasoline UST excavation. MW-9 exhibited the highest concentration of benzene at a concentration of 990 ppb. The benzene degradation rate calculated at MW-7 was applied to MW-9.

$$t = (\ln (c/co))/k = \text{Time to compliance}$$

ln = natural log

c = final concentration = one (1) ppb benzene

co = initial concentration of benzene in MW-9, 990 ppb

k = degradation rate 0.003078

$$t = 6.14 \text{ years to reach one (1) ppb}$$

$$\text{Duration of CEA} = 2,241 \text{ days or } 6.14 \text{ years}$$

$$\begin{aligned} \text{Length of CEA} &= 6.14 \text{ years} \times V_{pt} \\ &= 6.14 \text{ years} \times 2.341 \text{ ft/yr} \\ &= 14.373 \text{ ft} \end{aligned}$$

An updated benzene half-life was calculated using up-to-date sampling data. Based on the benzene transport rate calculated above, a benzene half-life of 225 days (MW-7) and an initial benzene concentration of 990 ppb (March 30, 1999), dissolved benzene concentrations are expected to naturally degrade to one (1) ppb within approximately 6.14 years and 14.37 feet downgradient of MW-9.

A CEA and WRA designation is requested, using natural remediation, for a duration of seven (7) years and cover an area of 100 feet by 100 feet of Walnford Park depicted on Figure 5 – CEA Designation Map. CEA and WRA designation forms are included in Exhibit VI.

5.7 Classification Exception Area (CEA) Application and Well Restriction Area (WRA) Application

A CEA and WRA are being proposed for a portion of Lot 2, Block 49, Upper Freehold, Monmouth County, New Jersey. The area totals approximately 10,000 square feet, as depicted on Figure 5. The CEA and WRA would restrict the use of the shallow water table aquifer within this area. Irrigation and/or potable wells that produce from the shallow water table aquifer could not be installed within this lot.

The CEA and WRA would be in place for seven (7) years, which would provide sufficient time to allow benzene concentrations to degrade to below the NJDEP Class II-A GWQS of one (1) ppb. Assuming a benzene half-life of 225 days and an initial benzene concentration of 990 ppb (March 30, 1999), benzene concentrations should continue to degrade to below one (1) ppb, through natural attenuation, in approximately 6.14 years from the most recent sampling round (March 30, 1999), taking into account varying geology, hydrogeology and degradation variables.

A seven (7) year CEA should allow for the variations in subsurface conditions, which affect the natural remediation process and provide adequate time for natural remediation to occur. The CEA would apply to benzene detected in the groundwater at the Walnford Park Maintenance Facility.

6.0 RECEPTOR EVALUATION

One (1) potable water well is located 90 feet sidegradient (east) of the gasoline-impacted groundwater plume. The potable water well is reported to exist sidegradient of the former gasoline UST impacted groundwater plume. The potable groundwater well was sampled during the February 13, 1998 site visit. The collected potable water well sample was submitted to Accredited for VOC analysis utilizing EPA Method 524 VO+10 calibrated to xylenes. The sampling results of the potable well indicated no detectable concentrations of VOCs. An abridged copy of the potable well sampling is included as Exhibit VII. The full laboratory data package was submitted in the October 1998 report, but was accidentally placed in Exhibit II. Please see Exhibit II of the October 1998 report for the full data package.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on information summarized in this report, BES recommends No Further Action with a CEA/WRA. Site-specific groundwater sampling results indicate that natural attenuation is ongoing and is an effective remedial option. In addition, the combination of a limited extent of impacted ground water, a slow migration rate, the presence of a low permeability soil type, the removal of the source, and a lack of potential receptors in the area all support the natural attenuation option. BES recommends the implementation of the CEA.

Soil sampling results in the location of the former diesel UST were below cleanup guidelines. Soil sampling results surrounding the former gasoline UST indicate a limited amount of impacted soil remains in the subsurface. Monitoring Well MW-7, downgradient of the gasoline UST, has demonstrated a decreasing trend of VOCs.

Current and potential groundwater users within the proposed CEA area are not expected to change during the coverage of the CEA duration of five (5) years. One (1) potable well is in use adjacent to the CEA area. The shallow aquifer (Marshalltown Formation), which is the aquifer affected by the discharge, is not considered a water-bearing zone. Potable water is obtained from the deeper Englishtown Formation at a depth of between 70 feet and 90 feet. (See the October 1998 report.) Groundwater samples collected from the on-site potable water well demonstrate that VOCs are not present in the potable well. No Further Action and case closure is recommended for the subject site.

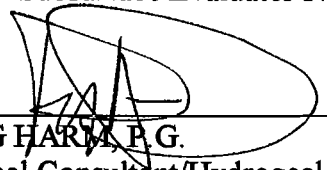
This report was prepared and is respectfully submitted by

BRINKERHOFF ENVIRONMENTAL SERVICES, INC.


MICHAEL H. MATRI
Environmental Project Manager
NJDEP Subsurface Evaluator No. 17115

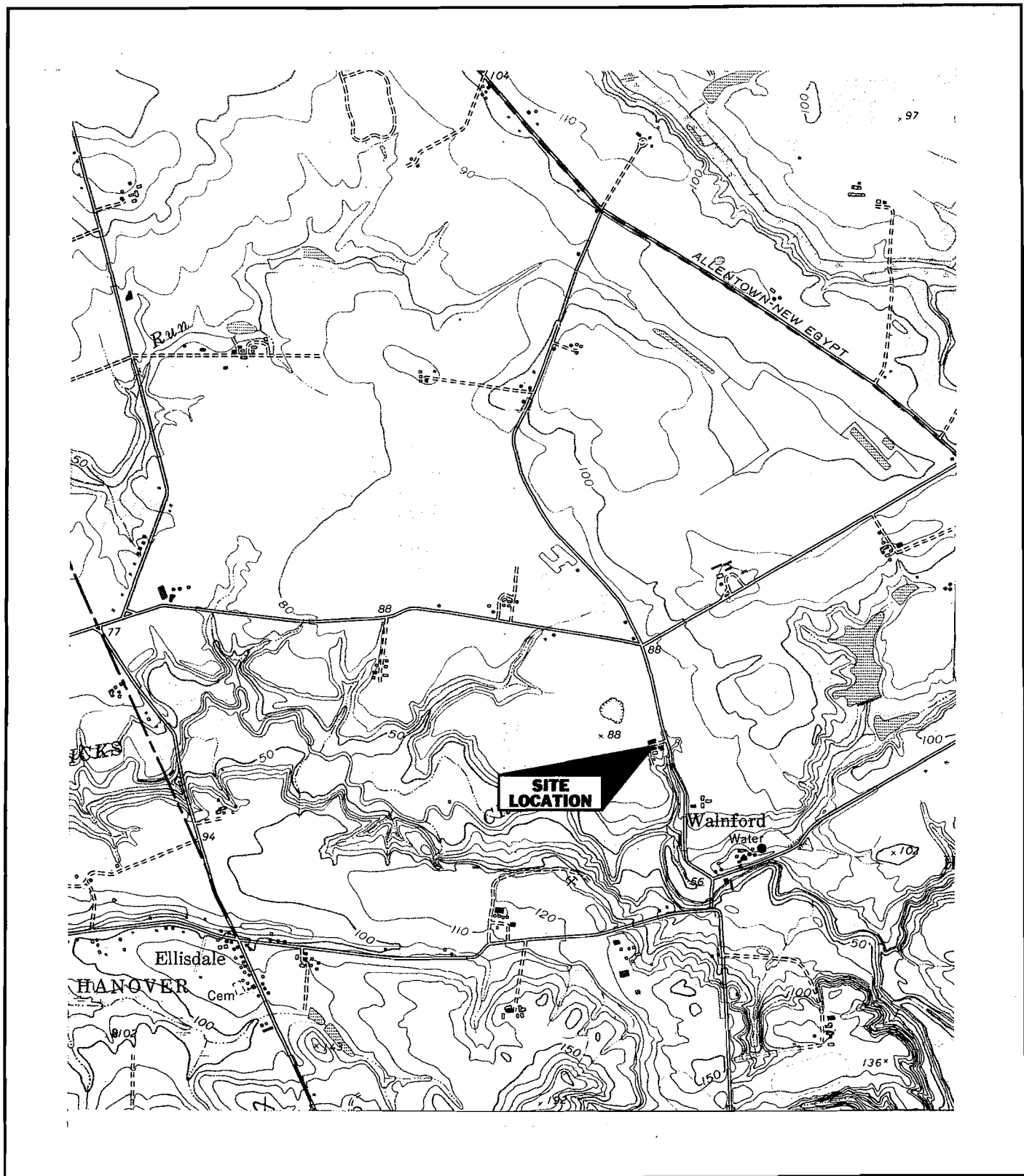
6-28-99

Date


DOUG HART, P.G.
Principal Consultant/Hydrogeologist
NJDEP Subsurface Evaluator No. 10556

6/28/99

Date

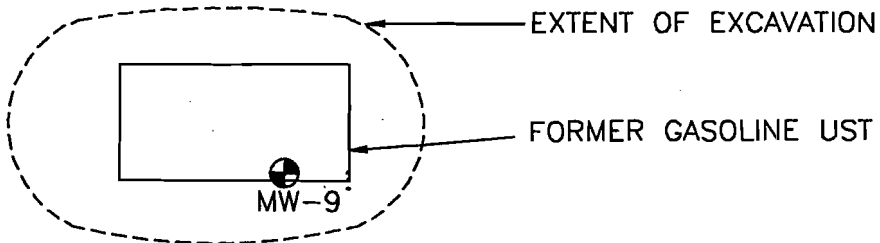


Brinkerhoff Environmental Services, Inc.

2430 Highway 34, Manasquan, NJ

Figure 1 – Site Location Map/ Topographic Map
Monmouth County Park System, Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 USGS Allentown Quadrangle

SCALE
 1"=2000'



SD-9 ●
BENZENE ND
XYLENES ND

● SD-6
BENZENE 3.6*
XYLENES 37

● SD-3
BENZENE ND
XYLENES ND

SD-8 ●
BENZENE ND
XYLENES ND

● SD-5
BENZENE 2.5
XYLENES 94

SD-7 ●
BENZENE 0.93
XYLENES 0.56

⊕ MW-7

GARAGE STRUCTURE

LEGEND

- ⊕ MONITORING WELL LOCATION
- SOIL BORING LOCATION
- * - BOLD* EXCEEDS NJDEP
IMPACT TO G.W. STANDARD

BRINKERHOFF

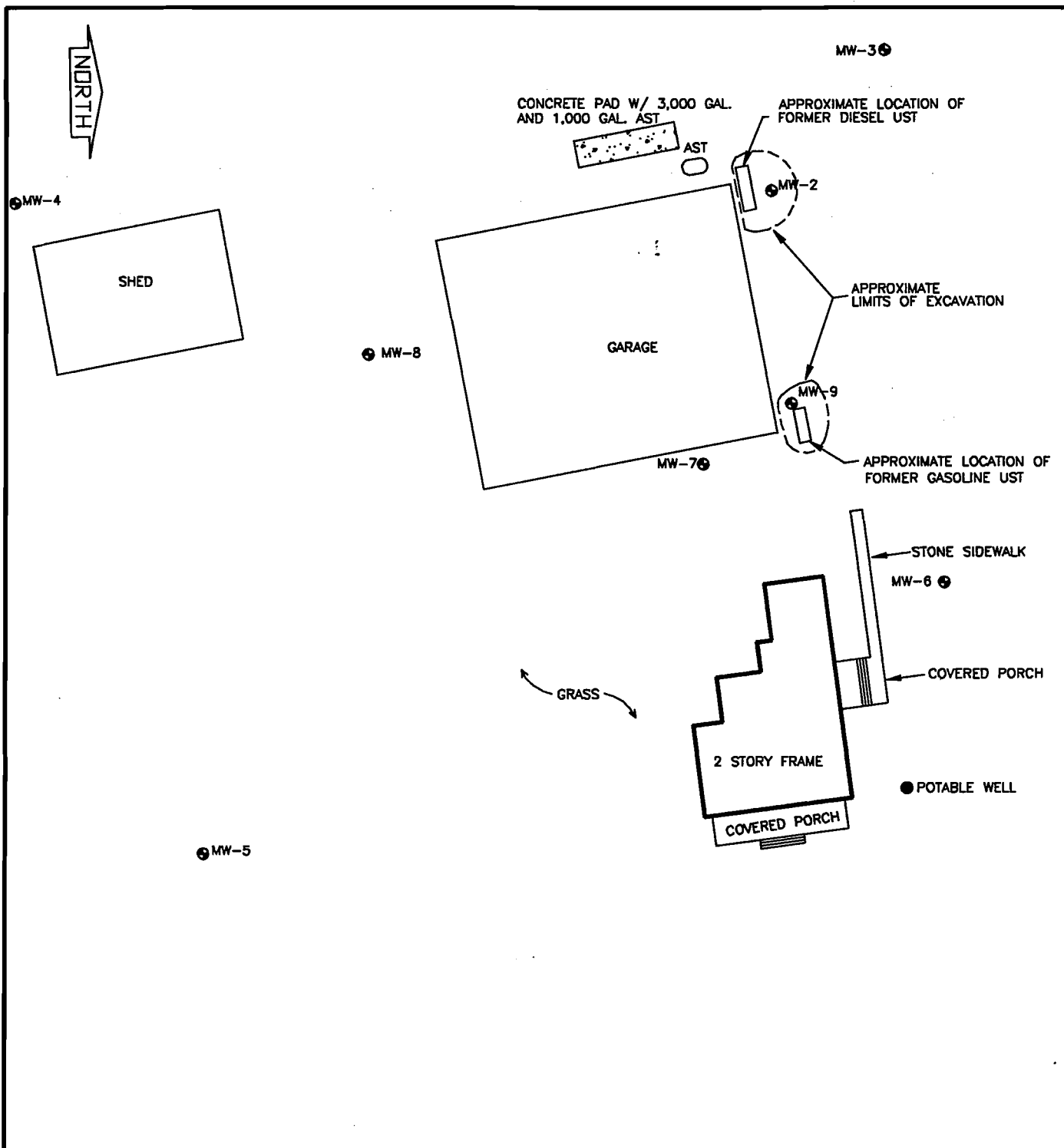
A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 2- SOIL BORING LOCATIONS
WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE: 6/10/99

JOB NO.: 96106D

SCALE: 1" = 10'



LEGEND

- ⊕ MONITORING WELL LOCATION
- GROUND WATER FLOW DIRECTION
- CONTOUR INTERVAL = 1.0 FEET
- 89.00 - GROUND WATER LEVEL CONTOUR

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FIGURE 3- SITE MAP
WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

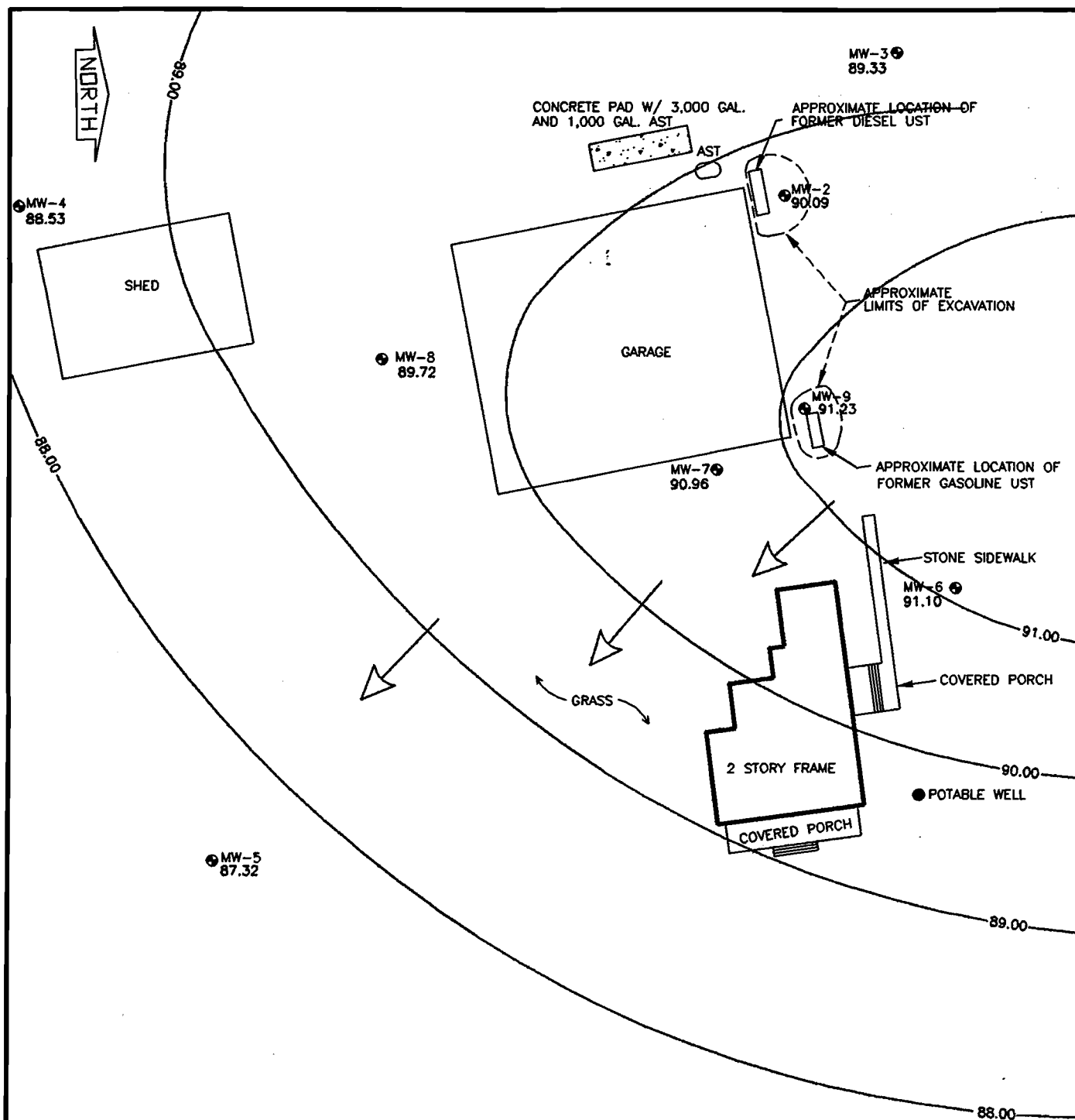
6/10/99

JOB NO.:

96106D

SCALE:

1" = 40'



LEGEND

- MONITORING WELL LOCATION
- GROUND WATER FLOW DIRECTION
- CONTOUR INTERVAL = 1.0 FEET
- 89.00 — GROUND WATER LEVEL CONTOUR

BRINKERHOFF

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FIGURE 4- GROUND WATER ELEVATION AND FLOW MAP (6/10/99)
WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

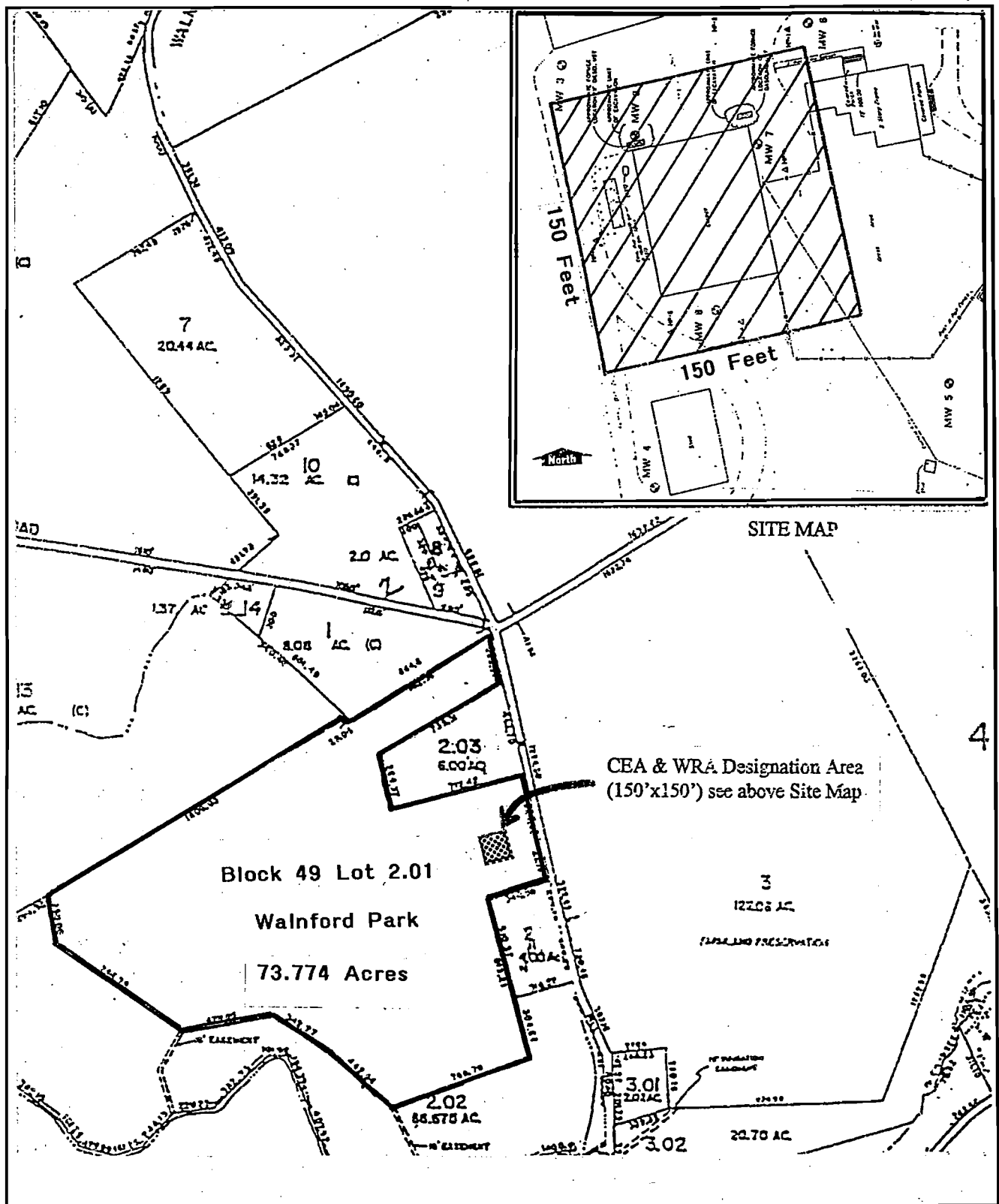
6/10/99

JOB NO.:

96106D

SCALE:

1" = 40'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

Figure 5 – CEA/WRA Designation Map
Monmouth County Park System, Wainford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 USGS Allentown Quadrangle

SCALE

REMEDIAL INVESTIGATION REPORT

**MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK
MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD)
MONMOUTH COUNTY, NEW JERSEY**

**NJDEP Case No. 93-12-17-1452-46
NJDEP Case No. 93-12-17-1205-53**

October 5, 2001

REMEDIAL INVESTIGATION REPORT
MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), MONMOUTH COUNTY, NEW JERSEY

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REMEDIAL INVESTIGATION REPORT
MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), MONMOUTH COUNTY, NEW JERSEY

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Figure 2 – Site Map

Figure 3 - Groundwater Contour Map

Figure 4 – Soil Boring Locations

EXHIBITS

Exhibit I - Potable Well Information Form

Exhibit II - Laboratory Analytical Data (Water) – May 7, 2001

Exhibit III - Monitoring Well Sampling Data Forms

Exhibit IV - Laboratory Analytical Data (Water) – April 30, 2001

Exhibit V - Laboratory Analytical Data (Soil) – May 7, 2001

REMEDIAL INVESTIGATION REPORT
MONMOUTH COUNTY PARK SYSTEM
WALNFORD PARK MAINTENANCE BUILDING
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD)
MONMOUTH COUNTY, NEW JERSEY

NJDEP Case No. 93-12-17-1452-46

NJDEP Case No. 93-12-17-1205-53

October 5, 2001

1.0 INTRODUCTION

On January 30, 2001, Brinkerhoff Environmental Services, Inc. (Brinkerhoff), representatives of the Monmouth County Park System (MCPS), and representatives of the New Jersey Department of Environmental Protection (NJDEP) held a meeting regarding the MCPS Walnford Park facility. (See Figure 1.) The meeting focused upon NJDEP requirements outlined in their correspondence dated August 4, 1999 and associated with the formerly-decommissioned gasoline underground storage tank (UST.) The results of the meeting were to complete environmental investigations of the following:

1. Completion of a receptor evaluation, specifically, resampling of an on-site residential potable well to ensure that petroleum-related compounds have not impacted the well;
2. Sampling of two (2) groundwater monitoring wells to generate data regarding the fate and transport of petroleum compounds in groundwater; and
3. Subsurface investigation of soil, specifically, the resampling of petroleum-impacted soil beneath the garage structure to delineate the extent of contamination and evaluate natural attenuation.

2.0 RECEPTOR EVALUATION

One (1) potable water well is located 90 feet sidegradient (east) of the gasoline-impacted groundwater plume. On May 7, 2001, Brinkerhoff collected representative groundwater samples from the potable well. An NJDEP Potable Well Information Form is included as Exhibit I. The potable well location is included on Figure 2.

The potable well was pumped at approximately three (3) gallons per minute for a duration of 45 minutes. Groundwater samples were collected prior to water-softening equipment. After collection, the samples were placed in a laboratory cooler on ice and transported to Brinkerhoff's office until picked up by Aqua Pro-Tech Laboratories (APL), an NJDEP-certified laboratory, NJDEP Certification No. 07010. The groundwater samples were analyzed for volatile organic compounds (VOCs), including a forward library search. The samples were analyzed by APL via EPA Method 524.1. The full laboratory analytical data are included in Exhibit II.

The potable well sampling analytical results reported nondetectable concentrations of targeted and nontargeted VOCs.

3.0 GROUNDWATER

3.1 Groundwater Monitoring

On April 30, 2001, Brinkerhoff completed groundwater monitoring and sampling at the site. The monitoring event included all of the monitoring wells, while groundwater sampling was limited to Wells MW-7 and MW-9. Groundwater monitoring included groundwater gauging and sampling. Monitoring well locations are presented on Figure 2.

Groundwater gauging was completed at all monitoring wells. Groundwater gauging data are summarized below in Table 1. Groundwater elevation contour maps were calculated from the groundwater gauging data. The groundwater elevation contour map is presented as Figure 3. The groundwater flow direction is predominantly toward the southeast and is consistent with past flow directions calculated for the site.

Table 1
Summary of Monitoring Well Gauging Data
August 6, 1996 through April 30, 2001
(Measurements in feet.)

Monitoring Well	Date	Total Well Depth	Top of Casing Elevation	Depth to Water	Water Table Elevation
MW-2	4-30-01	17.5	96.03	6.28	89.75
	3-30-99	17.5	96.03	5.96	90.07
	5-26-98	17.5	96.03	5.94	90.09
	2-13-98	17.5	96.03	6.04	89.99
	8-6-96	17.5	96.03	6.28	89.75
MW-3	4-30-01	15.0	93.37	4.14	89.23
	3-30-99	15.0	93.37	3.84	89.53
	5-26-98	15.0	93.37	4.04	89.33
	2-13-98	15.0	93.37	3.88	89.49
	8-6-96	15.0	93.37	NM	NM
MW-4	4-30-01	15.0	91.27	3.29	87.98
	3-30-99	15.0	91.27	2.65	88.62
	5-26-98	15.0	91.27	2.74	88.53
	2-13-98	15.0	91.27	2.13	89.14
	8-6-96	15.0	91.27	2.82	88.90
MW-5	4-30-01	15.0	92.83	5.86	86.97
	3-30-99	15.0	92.83	5.42	87.41
	5-26-98	15.0	92.83	5.51	87.32
	2-13-98	15.0	92.83	5.50	87.33
	8-6-96	15.0	92.83	5.73	87.10
MW-6	4-30-01	15.0	96.25	5.60	90.65
	3-30-99	15.0	96.25	4.81	91.44
	5-26-98	15.0	96.25	5.15	91.10
	2-13-98	15.0	96.25	5.25	91.00
	8-6-96	15.0	96.25	NM	NM
MW-7	4-30-01	17.9	95.02	4.51	90.51
	3-30-99	17.9	95.02	4.13	90.89
	5-26-98	17.9	95.02	4.06	90.96
	2-13-98	17.9	95.02	4.42	90.60
	8-6-96	17.9	95.02	4.83	90.19
MW-8	4-30-01	18.5	92.40	3.25	89.15
	3-30-99	18.5	92.40	2.74	89.66
	5-26-98	18.5	92.40	2.68	89.72
	2-13-98	18.5	92.40	2.73	89.67
	8-6-96	18.5	92.40	3.21	89.19
MW-9	4-30-01	15.0	94.63	3.94	90.69
	3-30-99	15.0	94.63	3.40	91.23

All measurements are in feet unless otherwise noted.

3.2 Groundwater Sampling and Analysis

On April 30, 2001, Monitoring Wells MW-7 and MW-9 were sampled. Monitoring Well MW-9 is located within the former gasoline UST excavation, while MW-7 is located 30 feet directly down hydraulic gradient from the source area. Monitoring Well MW-9 is a direct replacement of the formerly-destroyed Well MW-1.

Groundwater sampling was completed in accordance with procedures outlined in the NJDEP's May 1992 *Field Procedures Sampling Manual*. Field parameters of pH, temperature, conductivity and dissolved oxygen were collected prior to well purging and after sample collection. Collected field parameters are presented below in Table 2. Monitoring Well Sampling Data Forms are provided as Exhibit III.

Collected groundwater samples were placed in a cooler on ice and transported to Brinkerhoff's office until they were picked up by APL. Chain of custody documentation was maintained throughout sample handling. The groundwater samples were analyzed for VOCs, including a forward library search calibrated for xylenes. Laboratory analytical results are summarized below in Table 3. The full laboratory analytical data are provided as Exhibit IV.

Table 2
Summary of Field Readings
April 30, 2001

Well No.	Date	Prior to Evacuation				Subsequent to Sampling			
		PH	Temp °C	Cond. (mV)	D.O. mg/l	PH	Temp °C	Cond. (mV)	D.O. mg/l.
MW-7	3-30-99	5.1	13.8	340	2.63	5.8	14.2	1,430	3.78
MW-9	3-30-99	5.8	14.5	660	3.19	6.1	13.6	690	5.02

Table 3
Summary of Groundwater Sampling Laboratory Results
April 30, 2001

(Results in parts per million [ppm].)

Compound	MW-7	MW-9	NJDEP Standard
Benzene	55	1.3	1
Toluene	3.0	ND	500
Ethylbenzene	45	2.1	100
Total Xylenes	64	ND	67
MTBE	1.8	ND	70
Total TICs	530	292	500

ND - Not Detected; MTBE - Methyl Tertiary-Butyl Ether; TICs - Tentatively-Identified Compounds.

3.3 Groundwater Sampling Results

Laboratory results of groundwater samples collected from Well MW-9 reported slightly elevated concentrations of benzene. The detected concentration was one-point-three (1.3) parts per billion (ppb.) The detected benzene concentration slightly exceeded the NJDEP Class II-A Groundwater Quality Standards (GWQS) of one (1) ppb. Ethylbenzene and total TICs were detected at concentrations below their respective NJDEP GWQS

Laboratory results of groundwater samples collected from Well MW-7 reported elevated levels of targeted gasoline compounds. The detected compounds included benzene, toluene, ethylbenzene, total xylenes, MTBE, and total TICs. Benzene exceeded the NJDEP GWQS of one (1) ppb at a detected concentration of 55 ppb. Total TICs slightly exceeded the NJDEP GWQS of 500 ppb at a detected concentration of 530 ppb. The remaining detected compounds were below their respective NJDEP GWQS.

3.4 Historic Groundwater Sampling Results

Historic groundwater sampling results are summarized below in Table 4. Groundwater samples collected from Well MW-9 can be compared with historic groundwater sampling results of the destroyed MW-1. Well MW-9 was installed as a replacement to Well MW-1. Concentrations of targeted VOCs have decreased significantly since MW-1 was last sampled before its destruction during remedial soil excavation. Only benzene remains at concentrations that are above the NJDEP Class II-A GWQS.

Well MW-7 has exhibited a recent increase in the concentration of targeted compounds. Benzene increased from six (6) ppb on March 30, 1999 to 55 ppb on April 30, 2001. While the concentration of benzene detected in Well MW-7 has increased since the last sampling round, it does not exceed the maximum concentration observed in August of 1996.

Table 4
Summary Of Groundwater Sampling Results
 (Results in parts per billion [ppb].)

Monitoring Well	Sampling Date	Benzene	Ethylbenzene	Toluene	Total Xylenes	MTBE
MW-2	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	NT	NT	NT	NT	NT
	3-28-95	ND	ND	ND	ND	ND
MW-3	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-4	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	ND	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-5	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	8-6-96	ND	ND	0.9	ND	ND
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-6	5-26-98	NS	NS	NS	NS	NS
	2-13-98	NS	NS	NS	NS	NS
	4-17-95	ND	ND	ND	ND	ND
	3-28-95	ND	ND	ND	ND	ND
MW-7	4-30-01	55	3.0	45	64	1.8
	3-30-99	6	1.2	ND	ND	15
	5-26-98	23	1.3	0.9	3.6	ND
	2-13-98	40	10	2.2	7.1	150
	8-6-96	110	19	45	47	ND
MW-8	5-26-98	NS	NS	NS	NS	NS
	2-13-98	ND	ND	ND	ND	ND
	8-6-96	ND	ND	ND	ND	ND
MW-9	4-30-01	1.3	ND	2.1	ND	ND
	3-30-99	990	130	18	63	ND
MW-1	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed	Well Destroyed
	4-17-95	11,000	600	8,900	3,700	9,200
	3-28-95	9,900	790	8,700	4,000	10,000
	*NJDEP Standard	1	700	1,000	40	700

*NJDEP Standard - NJDEP Class II-A Groundwater Quality Standards (GWQS); ND – Compound not detected above the method detection limit; NA – Compound not analyzed; D - Indicates results based on a dilution; MTBE – Methyl Tertiary-Butyl Ether; DTW – Depth to Water; NS – Denotes well not sampled.

4.0 SUBSURFACE INVESTIGATION - SOIL

4.1 Soil Boring Installation

On May 7, 2001, Brinkerhoff installed soil borings and collected soil samples to confirm the presence of petroleum-impacted soils identified during postexcavation soil sampling and soil boring/soil sampling events completed on February 3, 1998 and March 16, 1999. The source of the petroleum impact was the former 1,000-gallon gasoline UST that was decommissioned in December of 1993. Two (2) soil borings were completed beneath the floor of the maintenance garage structure. Soil borings were completed, using a concrete coring machine and stainless steel hand augers. All borings were screened in six-inch (6") intervals for the presence of VOCs. Field-screening included the use of a photoionization detector (PID) and inspection for discernible evidence of petroleum impact such as free-phase petroleum, petroleum staining and odors.

The soil borings were designated SS-501-1 and SS-501-2. The soil borings were installed to investigate subsurface conditions in the area of historic Soil Borings SD-5 and SD-6 completed on February 3, 1998. Laboratory results of soil samples collected from the historic borings had exceeded NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) for benzene and xylenes.

The May 7, 2001 soil samples are summarized below in Table 5. Both of the soil borings exhibited elevated PID readings and strong petroleum odors starting at a depth of four (4) feet below grade. PID readings were highest at six (6) inches above the water table.

Table 5
Summary of Soil Sampling Field Measurements
May 7, 2001 Subsurface Investigation

Sample	Description	Depth of Sample (feet)	PID Reading (meter units)	Analysis
SS-501-1	6 inches above water table	5.5 - 6.0	200	VOCs
SS-501-1D	Deep Sample	9.5 - 10.0	200	VOCs
SS-501-2	6 inches above water table	5.5 - 6.0	200	VOCs

4.2 Soil Boring Soil Sampling Results

The May 7, 2001 soil boring soil sampling results are summarized below in Table 6. The full laboratory analytical data are provided as Exhibit V. Elevated concentrations of targeted VOCs were detected in all three (3) soil samples. Detected compounds included methylene chloride, benzene, toluene, ethylbenzene and total xylenes. All three (3) of the soil samples exceeded NJDEP IGWSCC for benzene. Soil Sample SS-501-1 also exceeded the NJDEP IGWSCC for methylene chloride. Methylene chloride is a common laboratory cross-contaminant and was reported within the laboratory quality control blank.

Table 6
Soil Sampling Results
May 7, 2001

(Concentrations in parts per million [ppm].)

Sample	Depth of Sample	Methylene Chloride	Benzene	Toluene	Ethylbenzene	Total Xylenes
SS-501-1	5.5 - 6.0	3.2	2.2	20.1	3.8	24.8
SS-501-1D	9.5 - 10.0	0.6	15.8	34.3	7.2	26.1
SS-501-2	5.5 - 6.0	0.3	4.1	31.8	5.3	40.9
*NJDEP		1	1	500	100	67

*NJDEP – Impact to Groundwater Soil Cleanup Criteria (IGWSCC); Compounds in **bold** exceed NJDEP standards.

4.3 Historic Soil Sampling Results

The historic delineation soil boring/soil sampling laboratory results are summarized below in Table 7. The May 7, 2001 results have been included in Table 7 for comparison. The soil boring locations are included on Figure 4.

Elevated levels of targeted VOCs persist in soil beneath the Walnford Park garage structure. The May 7, 2001 concentrations exhibit roughly the same concentrations of target compounds when compared with the historic soil sampling results.

Table 7
Historic Soil Sampling Results
February 3, 1998, March 16, 1999 and May 7, 2001
(Concentrations in parts per million [ppm].)

Sample	Date Sampled	Sample Depth	Methylene Chloride	Benzene	Toluene	Ethylbenzene	Xylenes
SS-501-1	5-7-01	5.5-6.0	3.2	2.2	20.1	3.8	24.8
SS-501-1D	5-7-01	9.5-10.0	0.6	15.8	34.3	7.2	26.1
SS-501-2	5-7-01	5.5-6.0	0.3	4.1	31.8	5.3	40.9
SD-1	2-3-98	9.5-10.0	ND	ND	ND	ND	ND
SD-2	2-3-98	4.0-4.5	ND	ND	1.5	ND	ND
SD-3	2-3-98	5.5-6.0	ND	ND	0.23	0.31	2.2
SD-5	2-3-98	5.5-6.0	ND	2.5	31	15	94
SD-6	2-3-98	5.5-6.0	ND	3.6	26	6.3	37
SD-7	3-16-99	5.5-6.0	ND	0.93	ND	0.33 J	0.56
SD-8	3-16-99	5.5-6.0	0.70 B	ND	ND	ND	ND
SD-9	3-16-99	5.5-6.0	ND	ND	ND	ND	ND
*NJDEP			1	1	500	100	67

*NJDEP – Impact to Groundwater Soil Cleanup Criteria (IGWSCC); ND – Compound not detected, Compounds in **bold** exceed NJDEP standards.

5.0 SUMMARY AND RECOMMENDATIONS

On January 30, 2001, Brinkerhoff, representatives of the MCPS and representatives of the NJDEP held a meeting regarding the MCPS Walnford Park Facility. The results of the meeting were to complete environmental investigations as follows: Resampling of an on-site residential potable well to ensure that petroleum-related compounds have not impacted the well, sampling of two (2) groundwater monitoring wells to generate data regarding the fate and transport of petroleum compounds in groundwater, and completion of a subsurface investigation of soil, specifically the resampling of petroleum-impacted soil beneath the garage structure to delineate the extent of contamination and evaluate natural attenuation.

A sample was collected from the potable well located adjacent to former gasoline UST area of environmental concern (AOC). Laboratory results reported nondetectable concentrations of targeted VOCs.

Groundwater samples were collected from Wells MW-7 and MW-9. Well MW-9 is located within the former gasoline UST excavation, while MW-7 is located 30 feet directly down hydraulic gradient from the former gasoline UST location. Laboratory results from Well MW-9 reported nearly compliant levels of targeted VOCs, with the exception of benzene, which was slightly over the NJDEP GWQS. Well MW-9 has exhibited a significant reduction in the concentration of targeted VOCs over time.

Well MW-7 has exhibited a decreasing trend in the concentration of targeted VOCs since last sampled in 1999. Although elevated since the last sampling event, the detected levels are significantly lower than the 1996 sampling results.

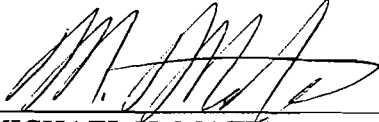
Soil borings were complete beneath the concrete slab foundation of the garage structure located within the former gasoline UST AOC. Several soil samples were collected to confirm the presence of gasoline compounds in soil at concentrations above NJDEP IGWSCC.

Elevated levels of benzene in the soil beneath the foundation of the garage structure persist. Benzene has been detected as deep as 10 feet below grade, four (4) feet deeper than the observed groundwater table, in this location.

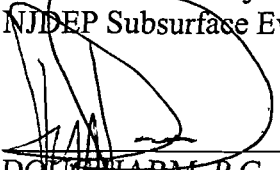
This report was prepared and is respectfully submitted by

BRINKERHOFF ENVIRONMENTAL SERVICES, INC.

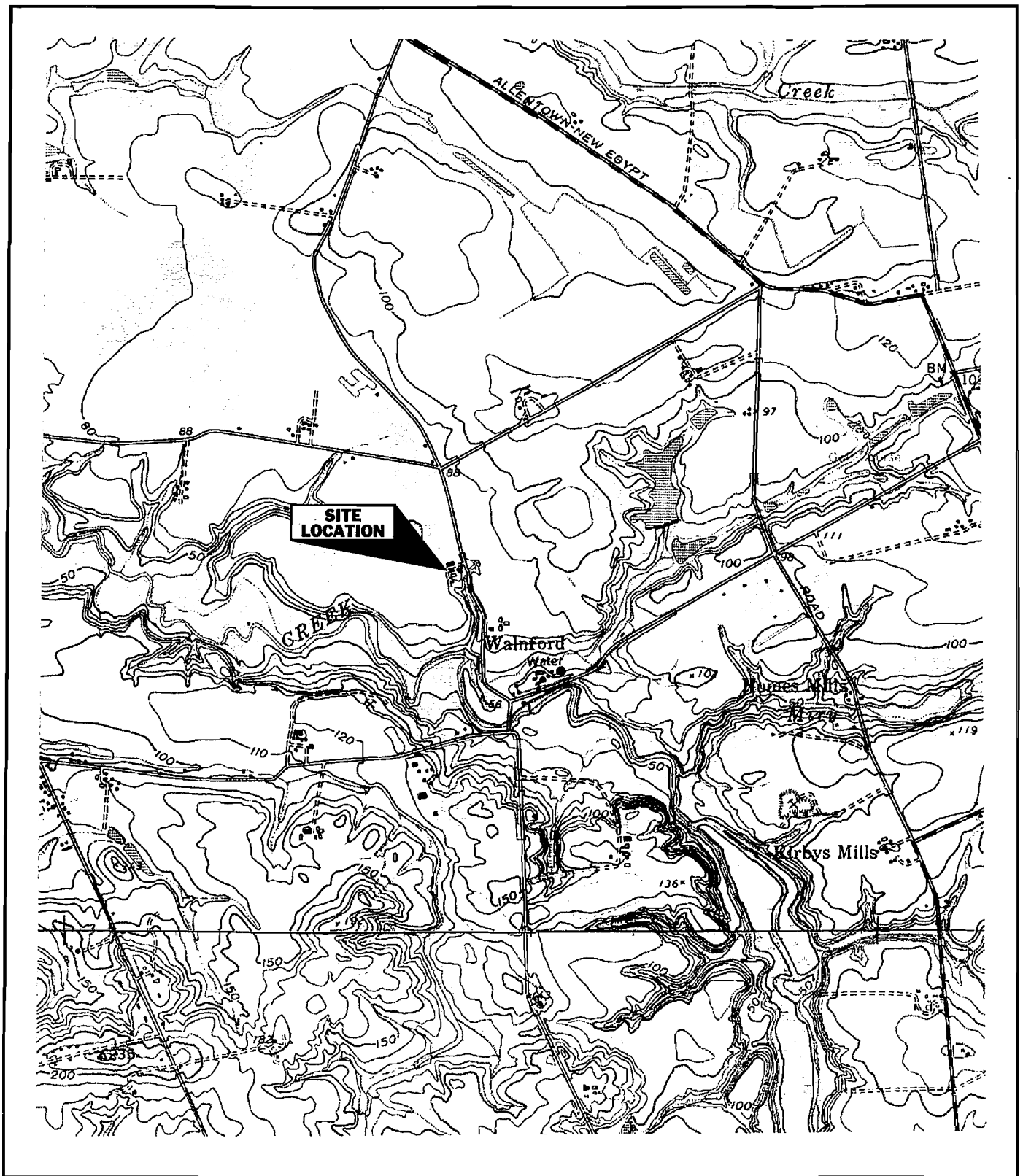
A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

 10-5-01

MICHAEL H. MATRI Date
Environmental Project Manager
NJDEP Subsurface Evaluator No. 17115

 10/5/01

DOUGLAS M. MATRI, P.G. Date
Principal Consultant/Hydrogeologist
NJDEP Subsurface Evaluator No. 10556



Brinkerhoff Environmental Services, Inc.

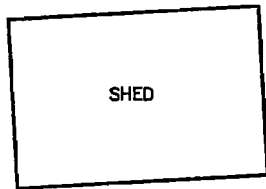
1913 Atlantic Ave., Suite R5, Manasquan, NJ

Figure 1 - Topographic Map/Site Location Map
Monmouth County Park System
Walnsford Park
Walns Mill (Hill) Road
Allentown, (Upper Freehold) Monmouth County, New Jersey

SCALE
1"=2000'

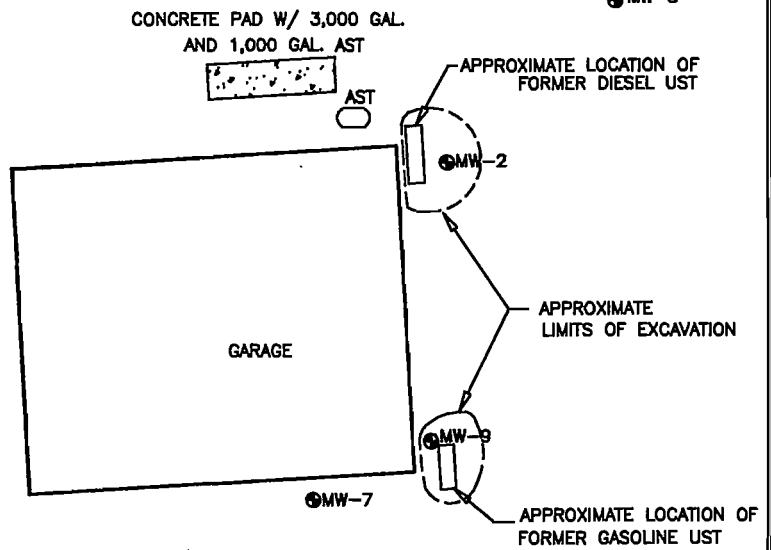


MW-4

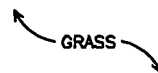


SHED

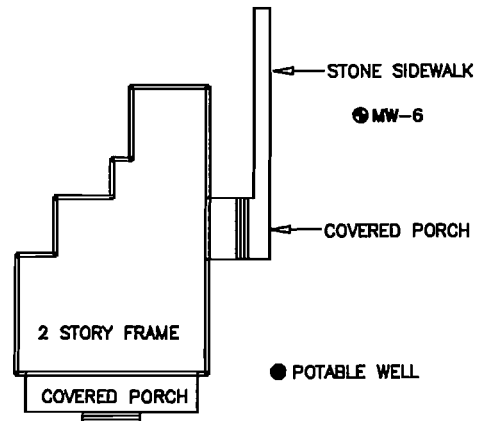
MW-8



MW-5



GRASS



LEGEND

⊕ - MONITORING WELL LOCATION

BRINKERHOFF

A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 2- SITE MAP

WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

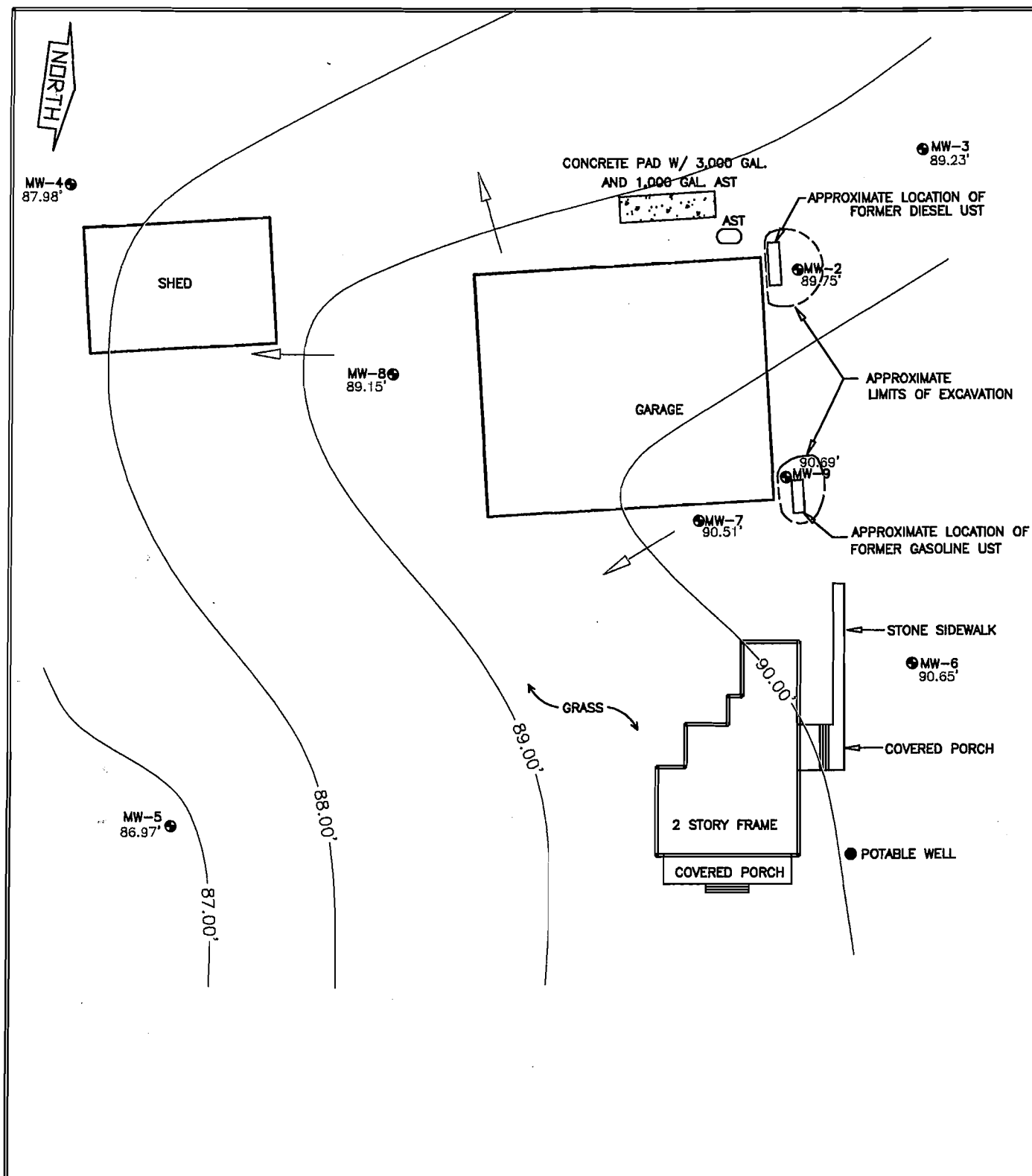
9/5/01

JOB NO.:

96106D

SCALE:

1" = 40'



LEGEND

-  - MONITORING WELL LOCATION
-  - GROUND WATER CONTOUR WITH FLOW DIRECTION

CONTOUR INTERVAL = 1.0 FEET

BRINKERHOFF

A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 3- GROUNDWATER CONTOUR MAP APRIL 30, 2001

WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

9/5/01

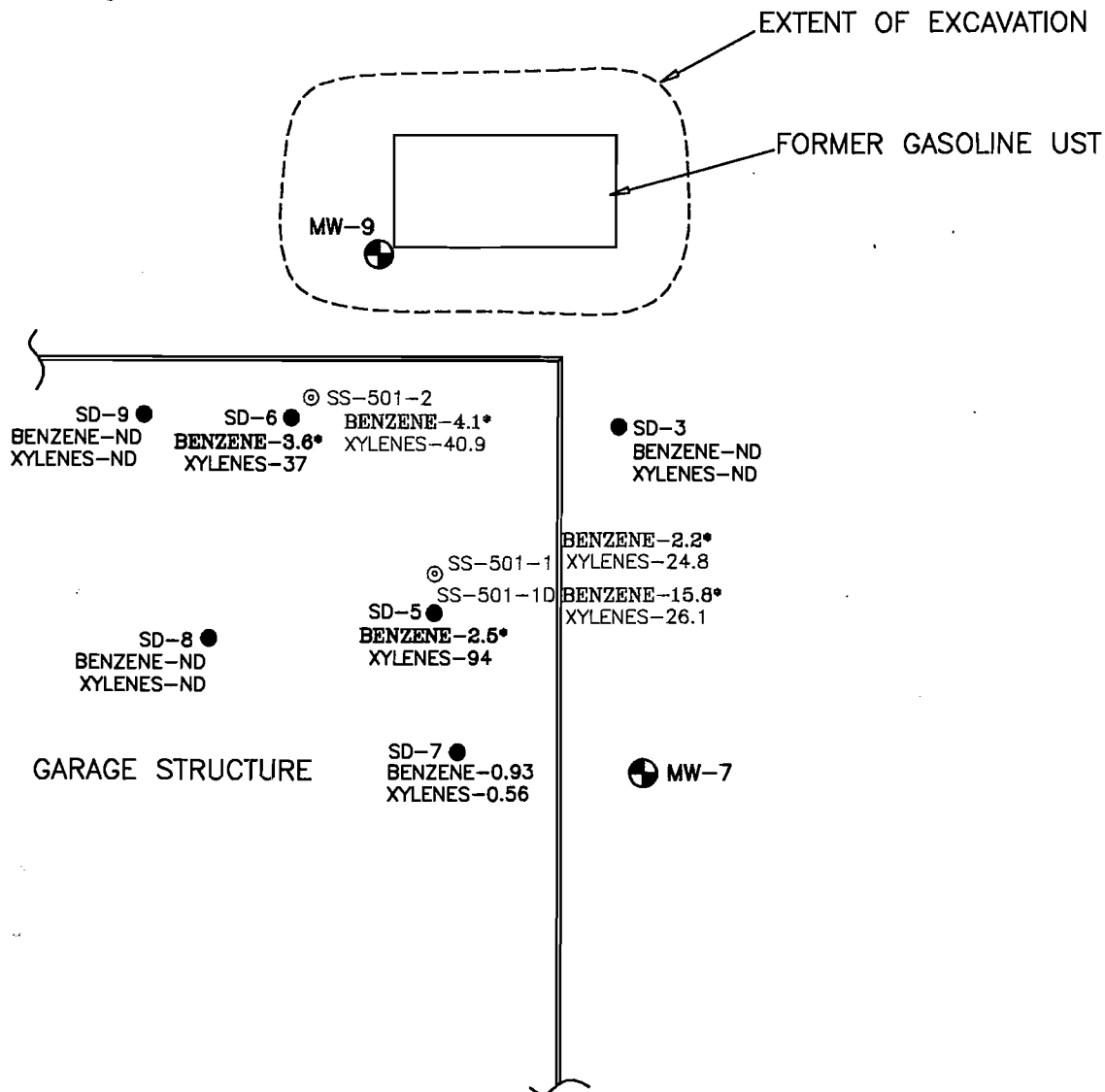
JOB NO.:

96106D

SCALE:

1" = 40'

NORTH



LEGEND

- ⊕ MONITORING WELL LOCATION
- SOIL SAMPLE LOCATION
- ◎ SOIL BORING LOCATION- 5/7/01
- *- BOLD * EXCEEDS NJDEP
IMPACT TO G.W. STANDARD

BRINKERHOFF

A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 4- SOIL BORING LOCATIONS

WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

9/5/01

JOB NO.:

96106D

SCALE:

1" = 10'

Najarian Associates

Engineers • Scientist • Planners • Surveyors

One Industrial Way West, Eatontown, 07724-2259

(732)389-0220

FAX (732)389-8546

LETTER OF TRANSMITTAL

TO MR. JAMES MOWCAN
MONMOUTH COUNTY PARK SYSTEM
805 NEWMAN SPRINGS ROAD
LINGBOET, NJ 07738

DATE	JAN 24, 2013	JOB NO.	6577
ATTENTION			
RE:	WALNFORD PARK FACILITY		
	91 WALNFORD ROAD		
	ALLEGENTOWN, NJ		

WE ARE SNENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

- ☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☒ R1 SUMMARY LETTER REPORT

COPIES	DATE	NO.	DESCRIPTION
2	1/24/13		REMEDIAL INVESTIGATION SUMMARY LETTER REPORT

THESE ARE TRANSMITTED as checked below

- ☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☒ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

*IF YOU HAVE ANY QUESTIONS OR COMMENTS, PLEASE
FEEL FREE TO CONTACT ME TO DISCUSS.*

COPY TO _____

SIGNED: Robert S.

January 24, 2013

Mr. James Mowczan, Senior Civil Engineer
Monmouth County Park System
805 Newman Springs Road
Lincroft, NJ 07738

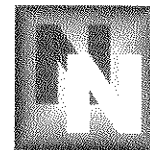
**Re: Remedial Investigation Summary Letter Report
Walnford Park Maintenance Facility
91 Walnford Road, Allentown
Monmouth County, NJ 08501
NJDEP PI Number: 022463
Case Number 93-12-17-1205-53
Our Ref. Job No. 6577**

Dear Mr. Mowczan:

T.O. Najarian Associates, Inc. (Najarian) was retained by the Monmouth County Park System to complete remedial investigation activities to address impacted groundwater at Walnford Park Maintenance Facility at 91 Walnford Road, Allentown, Upper Freehold Township, NJ (hereafter "Site" or "Property"). The site impacts are the result of leaking diesel and gasoline underground storage tanks (USTs) that were removed from the Property in December 1993. Contaminated soil was observed in both tank excavations at the time of the tank removals and the New Jersey Department of Environmental Protection (NJDEP) "Hotline" was notified of the releases; Case Numbers 93-12-17-1452-46 and 93-12-17-1205-53 were assigned, one per UST. Between the UST closure and 2001, soil remediation activities and soil and groundwater investigations were completed by other environmental consulting firms to address the contamination. A summary of the historic environmental work completed at the Site is presented in this letter report. Najarian sampled the groundwater at the Site in September 2012.

The NJDEP enacted the Site Remediation Reform Act (SRRA, N.J.S.A. 58:10C) in May 2009 with a three year phase-in period. SRRA and the corresponding regulations known as the Administrative Requirements for the Remediation of Contaminated Sites (ARRCS, N.J.A.C. 7:26C) set forth sweeping changes to the way in which sites are remediated in New Jersey. The legislation established an affirmative obligation to remediate discharges of hazardous substances in a timely manner. As part of the affirmative obligation, remediating parties must notify the Department, hire a Licensed Site Remediation Professional (LSRP), and remediate contamination pursuant to the Department's remediation rules within established regulatory and mandatory time frames.

Under the NJDEP LSRP program, the completion of specified site activities and the submission of forms documenting the information are required within established



timeframes. Prior to Najarian's involvement in this case, a Receptor Evaluation Form was sent to the NJDEP by the County. Since Najarian was retained, the case has met the requirements of the NJDEP LSRP program by completing the necessary activities documenting the actions in the following forms:

- LSRP Notice of Retention Form, May 2012, revised June 2012*
- Public Notification and Outreach Form, June 2012
- Annual Remediation Fee Reporting Form, September 2012

*The June 2012 form replaced the May 2012 form that listed the case as PI #G000027218 and Case # 93-12-17-1452-46. Based on NJDEP records, the current case is referenced as PI #022463 and Case # 93-12-17-1205-53.

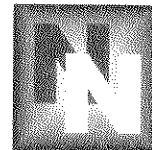
This remedial investigation letter report was prepared to summarize the historic environmental activities completed on the Site, to document the remedial investigation activities completed by Najarian, and based on this information, to provide recommendations to bring the case to closure. The remedial activities completed by Najarian involved the collection and analyses of groundwater samples from six (6) monitoring wells on September 5, 2012.

All remedial investigation activities were conducted in accordance with N.J.A.C. 7:26E (Technical Requirements for Site Remediation, dated May 7, 2012), the NJDEP Field Sampling Procedures Manual (last revised April 2005), and the Administrative Requirements for the Remediation of Contaminated Sites. Included in this report are several tables presenting historic groundwater and soil analytic data and sampling maps depicting previous soil and groundwater sampling locations. A Site Location Map is included as Figure 1, a Site Plan is included as Figure 2, and a Groundwater Contour and Analytical Results Map, based on Najarian's September 5, 2012 sampling event, is included as Figure 3.

Site History

The Site serves as a maintenance yard for the Monmouth County Park Service and consists of a maintenance building (#1715), a cedar block shed, and a 2 ½ story frame dwelling. Two (2) 1,000 gallon USTs and dispensers were formerly located along the north side of the maintenance building, with the diesel tank to the northwest and the gasoline tank to the northeast. Following the tank removals, the Site has been the subject of a number of soil and groundwater investigations to address the contamination in the area of the removed tanks. Based on information provided by Monmouth County, previous environmental work has been completed at the Site by French and Parrello Associates (FPA) and Brinkerhoff Environmental Services, Inc. (BES). The historic environmental reports prepared by these consultants and reviewed by Najarian as part of this letter report are listed below:

- **June 1995 UST/Site Investigation/Remedial Investigation Report (SI/RI) – FPA**
- **November 1996 Remedial Action Workplan (RAW) – BES**

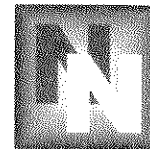


- **October 1998 RAW Addendum - BES**
- **June 1999 RAW Addendum - BES**
- **October 2001 RIR - BES**

On December 17, 1993, one (1) 1,000-gallon gasoline UST and one (1) 1,000-gallon diesel UST were decommissioned by removal and the environmental assessment was conducted by French & Parrello Associates, P.A. (FPA). During the removal of the gasoline and diesel USTs, stained soils were observed in the UST excavations generating NJDEP Case #'s 93-12-17-1452-46 (gasoline UST) and 93-12-17-1205-53 (diesel UST). Approximately thirty-seven (37) tons of contaminated soil were excavated from the gasoline and diesel UST areas and post-excavation soil samples were collected. The analytical results revealed concentrations of benzene and total xylenes above the NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) in affect at that time (1 part per million [ppm]) in the former gasoline UST excavation in several of the samples at depths of 8.0-8.5' below grade surface (bgs). Two of the benzene concentrations reported also exceeded the applicable NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) of 3 ppm in affect at that time. Concentrations of total xylenes were detected above the NJDEP IGWSCC in the former diesel UST excavation in one soil sample at 8.0-8.5' bgs. Due to the presence of contaminated soil and potential impact to the groundwater table, located within ten feet of grade, on May 5, 1994, two (2) groundwater monitoring wells (MW-1 and MW-2) were installed in each former UST location. The wells were later sampled by FPA. Volatile organic compound (VOC) contaminants above the NJDEP Groundwater Quality Standards (GWQS) were identified in the groundwater in the area of the former gasoline UST (MW-1), while groundwater in the former diesel UST excavation location (MW-2) exhibited non-detectable concentrations of VOCs. A copy of the figures and tables prepared by FPA depicting the post-excavation soil sample and monitoring well locations and results are included in Appendix A.

On January 30 and 31, 1995, to further evaluate the presence of elevated contaminant concentrations in soil and groundwater, delineation soil samples and hydropunch groundwater samples were collected in the area of the former USTs by FPA. In the soil, benzene was reported in excess of the IGWSCC and the Residential Soil Cleanup Criteria in several of the soil samples and benzene was reported above the GWQS in one groundwater sample during the investigation activities. The soil contamination was primarily found in the area surrounding the former gasoline UST; benzene was reported at elevated concentrations in samples collected at 8.0-8.5' and 10.0-10.5' bgs. Additional delineation was required. On March 6 and 7, 1995, four (4) additional monitoring wells (MW-3 through MW-6) were installed on the Site to further characterize and delineate the groundwater contamination. Historically, groundwater sampling results for monitoring wells (MW-1 through MW-6) demonstrated elevated levels of benzene, toluene, ethylbenzene and total xylenes (BTEX) and methyl tert butyl ether (MTBE) in MW-1 only. A copy of the figures and tables prepared by FPA associated with these delineation activities depicting sample locations and results are included in Appendix A.

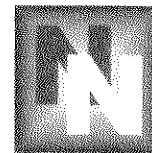
Brinkerhoff Environmental Services (BES) was contracted by Monmouth County Park System to continue the remediation of contaminated soils and groundwater at the Site.



On May 30, 1996, due to the elevated compound concentrations reported in the soil samples in the area of the former gasoline UST, forty-five (45) tons of contaminated soil were excavated from this area to approximately 10' deep and five (5) post-excavation soil samples were collected by BES. None of the post-excavation samples reported contaminant concentrations in excess of the IGWSCC, the most stringent criteria in affect at that time, although concentrations of benzene, toluene, and total xylenes were detected. Attempts were made to excavate contaminated soils from the former diesel UST where one soil sample from the 1993 decommissioning event reported levels of total xylenes above the IGWSCC. However, due to the nature of the soils, the walls of the excavation continued to collapse and began undermining of the garage floor of the maintenance building and jeopardizing the integrity of monitoring well MW-2. Additional excavation activities were not recommended for the former diesel UST because the limited area of contaminated soil was not impacting groundwater, as illustrated in historic sampling events for monitoring well MW-2. During the May 1996 excavation events, monitoring well MW-1 was abandoned and destroyed. A copy of a figure prepared by BES depicting the sample locations is included in Appendix B and results are summarized on Table 1.

On July 18, 1996, two (2) additional down-gradient monitoring wells (MW-7 and MW-8) were installed and later sampled by BES on August 6, 1996. In February 1998, three (3) soil samples were collected beneath the maintenance garage floor to delineate the extent of contamination associated with the former gasoline UST under the onsite garage, two (2) soil samples were collected in and around the former diesel UST, and a round of groundwater samples was collected from monitoring wells MW-2 through MW-8. Another round of groundwater samples were collected on May 26, 1998 for MW-2 through MW-8. On March 15 and 16, 1999, monitoring well MW-9 was installed to replace former MW-1 and three (3) additional soil samples were collected to further delineate soil contamination under the garage floor. On March 30, 1999 and April 30, 2001, monitoring wells MW-7 and MW-9 were sampled. Lastly, on May 7, 2001, three (3) additional soil samples were collected beneath the garage floor to further characterize soil contamination associated with the former gasoline UST.

When comparing the soil samples collected between 1998 and 2001 to the IGWSCC in affect at that time, several of the samples reported elevated benzene and total xylenes concentrations. Several of the benzene concentrations also exceeded the RDCSCC of 3 ppm and one exceeded the Non-Residential DCSCC (NRDCSCC) of 13 ppm. Revised impact to groundwater soil remediation standards, the Impact to Groundwater Soil Screening Levels (IGWSSL), were issued by the NJDEP in December 2008, and benzene, toluene, and ethylbenzene criteria became more stringent, while the criteria for total xylenes was slightly increased. When comparing the historic soil sampling data to the current IGWSSL, elevated BTEX concentrations exist in the soil remaining in the ground, particularly benzene. Benzene concentrations in several of these samples also exceed the current Residential Direct Contact Soil Remediation Standard (RDCSRS), effective May 7, 2012, of 2 ppm. One sample collected beneath the maintenance garage at a depth of 9.5' to 10.0' bgs reported benzene at 15.8 ppm, which also exceeds the current NRDCSRS of 5 ppm. Table 1 depicts the historic soil sampling results along with the IGWSCC, IGWSSL, NRDCSRS, and RDCSRS. Highlighted cells represent contaminant concentrations in excess of the current NJDEP IGWSSL.



The contamination remaining in the ground is primarily located in the former area of the gasoline UST and beneath the northeast corner of the maintenance garage floor. The samples collected in these areas demonstrate impacted soil between the depths of 5.5' and 10' below grade. The horizontal and vertical extent of the contamination has not yet been fully delineated. The soil samples collected in the vicinity of the former diesel UST exhibited concentrations of toluene, which, although below the IGWSSL, may indicate the presence of soil contamination in the area of the former UST. A copy of the figures prepared by BES associated with the soil delineation activities are included in Appendix B. Results are included in Table 1-Historic Soil Analytical Results.

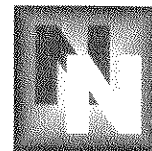
Onsite groundwater monitoring data and samples were collected by BES during the February 1998, May 1998, March 1999 and April 2001 investigations and elevated levels of VOCs were reported in MW-7 and MW-9. The wells are depicted on the Site Plan, Figure 2 and the results are included in Table 2-Historic Groundwater Analytical Results.

A potable well is located onsite and services the residential building. This well is located sidegradient to monitoring wells MW-7 and MW-9, which historically demonstrated groundwater impact from the release from the former gasoline UST. The potable well was sampled during BES's February 1998 and May 2001 site investigations and no contaminants were detected. The potable well analytical data is summarized on Table 2 and the well location is depicted on the Site Plan, Figure 2.

A total of nine (9) monitoring wells were installed at the Site: MW-1, which was destroyed and replaced with MW-9, and MW-2 through MW-8, although only eight wells existed on the Site at one time. The remedial actions and investigations conducted by FPA and BES between 1993 and 2001 revealed BTEX and MTBE concentrations above the GWQS in MW-1/9 and MW-7, the wells closest to the former gasoline UST. In soil, benzene, toluene, and total xylenes were reported at concentrations exceeding the current soil remediation standards (IGWSSL) in the area of the former gasoline UST. Benzene concentrations also exceed the current RDCSRS and NRDCSRS. Results of the previous investigations identified soil impacts within the area of the former gasoline UST that extend beneath the adjacent garage slab. A summary of the historic contaminated soils above the most stringent NJDEP soil standard (IGWSSL) that are still present onsite is included on Table 1. All impacted soil in the former gasoline UST area requires horizontal and vertical delineation; this requirement is discussed in the recommendations section. This report addresses and further identifies the groundwater characteristics from Najarian's September 2012 sampling event.

Field Methods and Sampling Procedures

Groundwater samples were collected from on-site monitoring wells MW-2, MW-4, MW-6, MW-7, and MW-9 on September 5, 2012 in accordance with the NJDEP Technical Requirements for Site Remediation and the Field Sampling Procedures Manual (FSPM). Monitoring well MW-8 could not be located and, thus, was not monitored or sampled. MW-3 is located up gradient and has never reported contaminants; therefore this well was not sampled. Prior to groundwater purging and sampling activities, depth to



groundwater was measured in all existing on-site monitoring wells. Groundwater elevations were recorded in the field log book and used to create a groundwater contour map. A summary of groundwater elevations is included on Table 3. Sampled monitoring wells were purged of three to five well volumes and allowed sufficient time to recharge prior to collection of groundwater samples. Groundwater samples were collected with a single-use Teflon bailer. Water quality parameters including pH, oxidation-reduction potential, dissolved oxygen, temperature, and conductivity were measured before and after purging wells and during sampling. Well information summaries of the water quality readings for the September 5, 2012 sampling event are included as Table 4.

Samples collected from monitoring wells MW-2, MW-4, MW-6, MW-7, and MW-9 were analyzed for Target Compound List volatile organic compounds (TCL VOCs) plus 15 library search compounds, MTBE, and tert butyl alcohol (TBA) analysis by United States Environmental Protection Agency (USEPA) Method 8260B and 8011. Samples from monitoring wells MW-2 and MW-5 were additionally analyzed for base neutral/acid extractables (BNA) plus 20 library search compounds by USEPA Method 8070. For quality assurance/quality control purposes, field blank, field duplicate and trip blank samples were prepared. The samples were analyzed by Integrated Analytical Laboratories, LLC (IAL) of Randolph, New Jersey (NJDEP laboratory number 14751). A summary of the analytical methods and quality assurance procedures is included on Table 5.

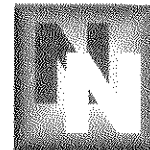
Groundwater Flow Conditions

Groundwater elevation measurements of on-site monitoring wells were recorded during the September 2012 sampling event. The shallow groundwater flow direction has not changed from observations documented in previous reports and was determined to be toward the southeast. Groundwater elevations for the September 2012 sampling event are provided in Table 3. A groundwater elevation contour map for the September 2012 sampling event is provided as Figure 3.

Analytical Results

Monitoring wells MW-2, MW-4, MW-6, MW-7, and MW-9 were sampled on September 5, 2012. All groundwater samples collected during the September 2012 monitoring event were submitted to Integrated Analytical Laboratories, Inc. (IAL) for Target Compound List Volatile Organic Compounds plus 15 library search compounds (TCL VOC+15), tert butyl alcohol (TBA), and ethylenedibromide (EDB) analysis. In addition, samples collected from monitoring wells located within and downgradient of the former diesel UST area (MW-2 and MW-4) were submitted to IAL for TCL Base Neutral plus 25 library search compounds (BN+25) and single ion monitoring (SIM) analysis. A summary of the September 2012 analytical results are presented on Table 6 and illustrated on Figure 3. The analytical results indicate that:

- No targeted compounds were detected above their respective NJDEP Groundwater Quality Standard in samples collected from any monitoring well sampled during the September 2012 monitoring event.



- No compounds were detected in the trip blank or field blank.
- The QA/QC duplicate sample results were similar to its respective environmental sample.

It is important to note that plume edge well MW-8 could not be located and, consequently, was not sampled. In addition, monitoring well MW-8 is best located to capture plume movement that may have resulted from advection and dispersion. While no targeted compounds were detected at concentrations above NJDEP GWQS in any well sampled during the September 2012 monitoring event, conclusive natural attenuation of the hydrocarbon plume can not be conclusively ascertained due to the lack of data from monitoring well MW-8. A summary of the groundwater sampling analytical results from April 1995 to September 2012 is included in Table 7.

Recommendations

Soils

Historic soil data revealed elevated levels of benzene, toluene and total xylenes above the most stringent NJDEP soil remediation standard in the area of the former gasoline UST. Although some soil was excavated following removal of the UST, soil samples collected beneath the garage maintenance floor and on the north side of the former gasoline UST excavation as part of previous remedial investigations demonstrate contaminant levels above the current NJDEP IGWSSL. Benzene was also reported at levels in excess of NJDEP Direct Contact Soil Remediation Standards. Additional soil sampling is required to determine whether elevated concentrations of gasoline constituents remain in the area, and if so, to determine the horizontal and vertical extent of the contamination.

The area of the former diesel UST needs to be further evaluated due to the possibility of residual soil contamination, as previous soil excavation attempts were thwarted due to the proximity of the maintenance garage and MW-2 and the fact that one historic soil sample reported the presence of toluene.

As presented in the NJDEP Technical Requirements for Site Remediation (N.J.A.C. 7:26E, dated May 7, 2012), the vertical and horizontal extents of soil with contaminants in excess of the most stringent NJDEP soil remediation standards need to be determined during the Remedial Investigation (RI). Additional RI activities are required at the Site to meet this requirement.

Groundwater

Historic groundwater data reported elevated concentrations of BTEX and MTBE in monitoring wells MW-1/MW-9 and MW-7 from 1995-2001. All other monitoring wells reported non-detectable concentrations or concentrations below their respective GWQS.



The most recent groundwater data (September 2012) reported non-detectable concentrations in all of the monitoring wells sampled: MW-2, MW-4, MW-5, MW-6, MW-7, and MW-9. However, during the most recent sampling event, the side/down gradient monitoring well MW-8 could not be located and therefore no groundwater data were generated. Additional investigation directly down-gradient of the source area (former gasoline UST) is needed to fully evaluate whether groundwater impact remains.

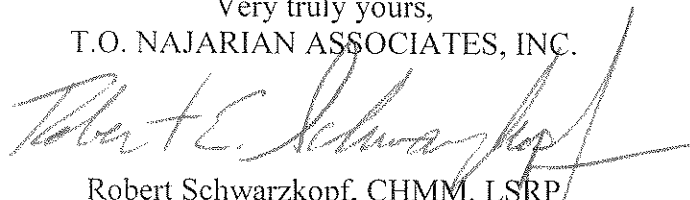
Prior to the initiation of additional RI activities on the Property, a file review at the NJDEP in Trenton is required to evaluate all correspondence pertaining to this case. If the soil and groundwater RI activities do not indicate the presence of contaminants at concentrations in excess of applicable NJDEP IGWSSL and GWQS, a Remedial Investigation Report (RIR)/Remedial Action Report (RAR), along with all required forms, will be prepared by the LSRP and submitted to the NJDEP. A Response Action Outcome (RAO) addressing the former UST area-of-concern (soil and groundwater) may then be issued by the LSRP.

If contaminants are discovered during the remedial investigation, additional delineation activities and remediation will be required. A Remedial Investigation Report (RIR) and Remedial Action Workplan (RAW) will be prepared and submitted to the NJDEP along with the required forms. The RIR/RAW will document the site activities and analytical results, outline the specific remedial activities to address the contamination, and will include the required figures, laboratory data, and deliverables. Once all contaminants in the soil and/or groundwater are adequately addressed, a Remedial Action Report (RAR) and an RAO can be issued by the LSRP.

A scope of work and associated costs to complete the necessary remedial investigation activities for soil and groundwater will be sent to you for your review.

If you have any questions, please give me a call.

Very truly yours,
T.O. NAJARIAN ASSOCIATES, INC.

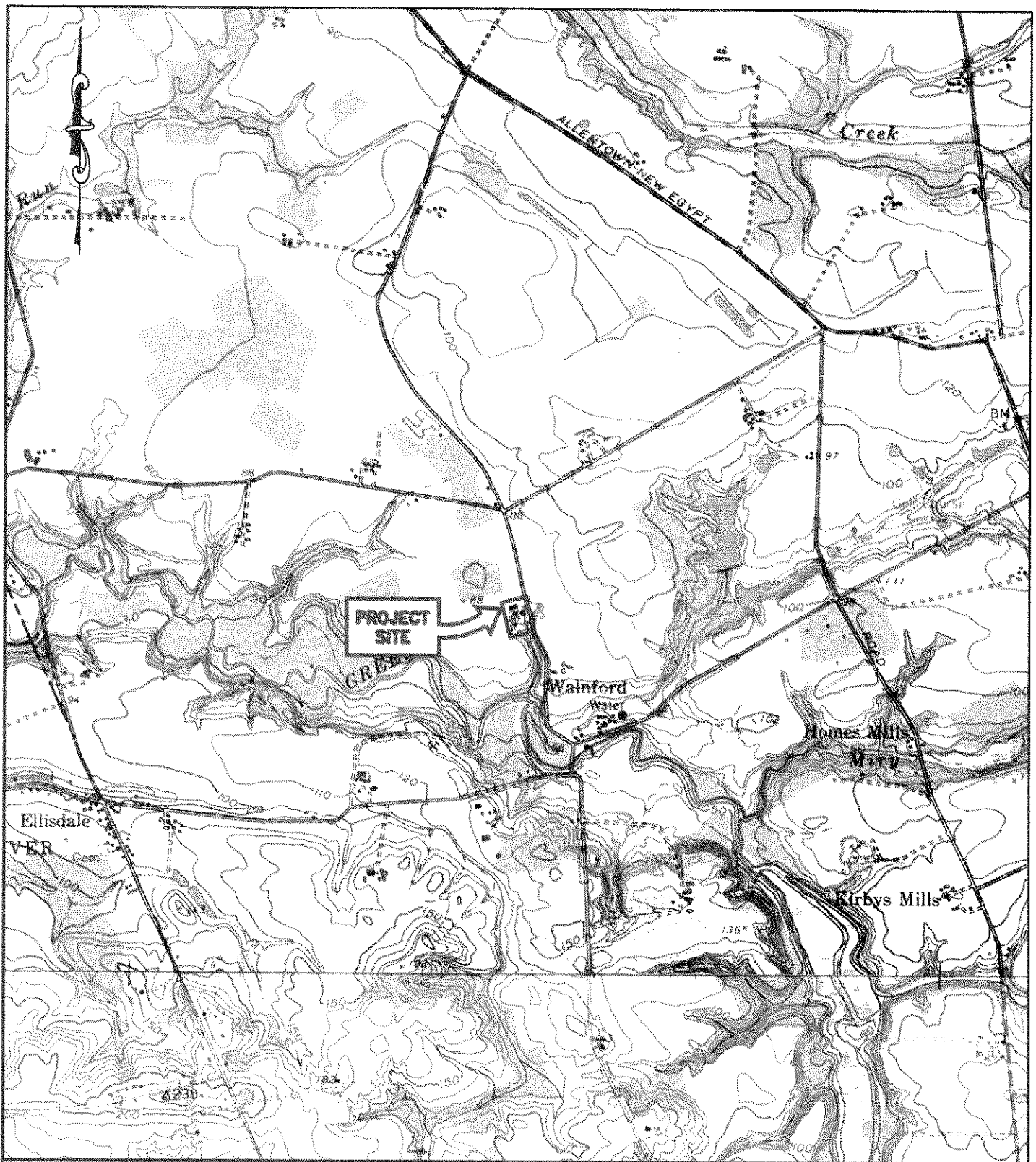


Robert Schwarzkopf, CHMM, LSRP
Senior Environmental Scientist / Project Manager

cc: Dana M. Kitchell, Environmental Geologist
Vajira Gunawardana, P.E., PP, CFM, F. ASCE

FIGURES

Y:\6577 Walnford Park LSRP\Figures\6577-USGS.dwg 1/22/2013 10:57:04 AM EST



LEGEND:

SOURCE: U.S.G.S. ALLENTOWN & NEW EGYPT

1"=2000'
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scale feet

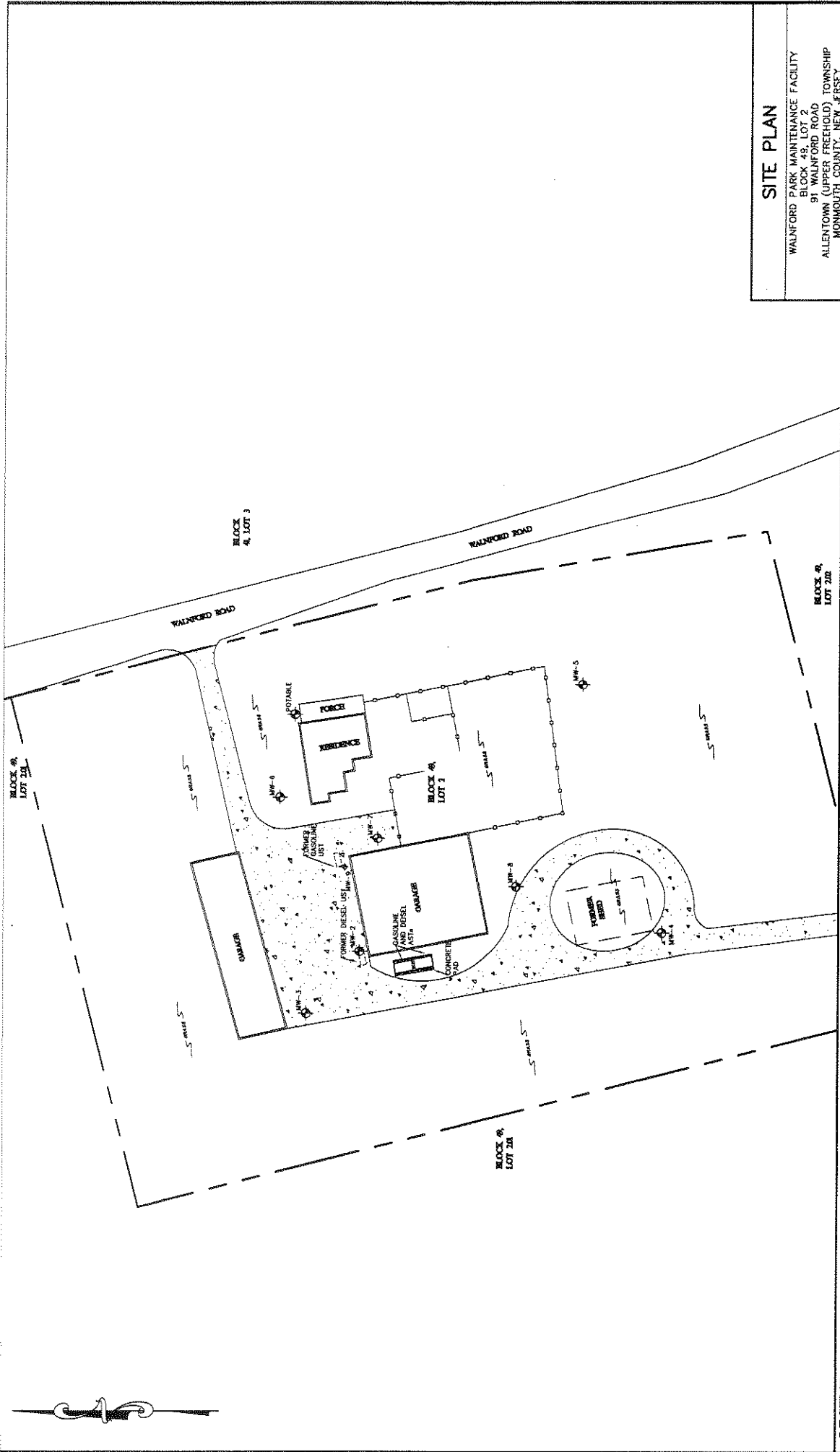
SITE LOCATION MAP

WALNORD PARK MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALNORD ROAD
ALLENTOWN (UPPER FREEHOLD) TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY

 **Najarian**
Associates

Engineers • Planners • Scientists • Surveyors
One Industrial Way West, Eatontown, New Jersey 07724

DRAWN BY	SCALE	DATE	DWG. NO.	FIGURE
W.S.	1"=2000'	1-22-13	6577	I



LEGEND

- FENCE
- — — PROPERTY BOUNDARY
- — — FORMER STRUCTURE
- GRAVEL
- MW-1 MONITORING WELL LOCATION

NOTES

PLAN BASED ON 2007 AERIAL PHOTOGRAPH AND UPPER FREEHOLD TAX MAP.

SITE PLAN

WALFORD PARK MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALFORD ROAD
ALLEN TOWN (UPPER FREEHOLD) TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY



Najarian
Associates

Professional Engineers, Land Surveyors, & Planners - Scientists
One Industrial Way West, Easton, New Jersey 07824
(732) 389-0520 • Facsimile No. (732) 389-8546
Certificate of Authorization # 24CA27993-500

DATE: 11-28-12
SCALE: 1"=40'
PROJECT NO.: 6577.E00
PAGE NO.: 2

TABLES

Table 1
Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Historic Soil Analytical Results

Soil Sample	Sampling Date	Sample Depth (fbs)	Collected by	Benzene	Toluene	Ethylbenzene	Total Xylenes
				Results reported in parts per million (ppm)			
NJDEP NON-RES DCSRS				5	91,000	110,000	170,000
NJDEP RES DCSRS				2	6,300	7,800	12,000
NJDEP IGWSSC (old standard)				1	500	100	10
NJDEP IGWSSL (current standard)				0.005	4	8	12
WG-1*	12/17/1993	8.0-8.5	FPA	8.1	120	69.0	290.0
WG-2*	12/17/1993	8.0-8.5	FPA	0.4	3.8	3.0	13.0
WG-3*	12/17/1993	8.0-8.5	FPA	4.8	150.0	40.0	230.0
WG-4*	12/17/1993	8.0-8.5	FPA	1.2	150.0	76	1700
WG-5*	12/17/1993	8.0-8.5	FPA	1.7	130.0	42.0	280.0
WD-1*	12/17/1993	8.0-8.5	FPA	0.3	2.8	7.7	94.0
WD-2*	12/17/1993	8.0-8.5	FPA	NA	NA	NA	NA
WD-3*	12/17/1993	8.0-8.5	FPA	NA	NA	NA	NA
WD-4*	12/17/1993	8.0-8.5	FPA	NA	NA	NA	NA
WD-6*	12/17/1993	8.0-8.5	FPA	NA	NA	NA	NA
WD-7*	1/30/1995	8.0-8.5	FPA	NA	NA	NA	NA
WD-7A*	1/30/1995	10.0-10.5	FPA	NA	NA	NA	NA
WD-8*	1/30/1995	8.0-8.5	FPA	NA	NA	NA	NA
WD-8A*	1/30/1995	10.0-10.5	FPA	NA	NA	NA	NA
WD-9*	1/30/1995	8.0-8.5	FPA	NA	NA	NA	NA
WD-9A*	1/30/1995	10.0-10.5	FPA	NA	NA	NA	NA
WD-10	1/30/1995	8.0-8.5	FPA	ND	ND	ND	0.0048
WD-10A	1/30/1995	10.0-10.5	FPA	ND	ND	ND	0.0038
WD-11	1/30/1995	8.0-8.5	FPA	ND	ND	ND	0.0032
WD-11A	1/30/1995	10.0-10.5	FPA	ND	ND	ND	ND
WD-12	1/30/1995	8.0-8.5	FPA	ND	ND	ND	0.0022
WD-12A	1/30/1995	10.0-10.5	FPA	ND	ND	ND	ND
WD-13	1/30/1995	8.0-8.5	FPA	0.45	1.5	0.25	2.2
WD-13A	1/30/1995	10.0-10.5	FPA	0.38	0.014	0.0047	0.025
WD-14*	1/31/1995	8.0-8.5	FPA	7.4	4.3	0.34	1.7
WD-14A*	1/31/1995	10.0-10.5	FPA	8.7	14.0	0.59	3.0
WD-15	1/31/1995	8.0-8.5	FPA	0.21	0.033	0.0061	0.032
WD-15A	1/31/1995	10.0-10.5	FPA	0.026	0.023	0.0051	0.030
WD-16*	1/31/1995	8.0-8.5	FPA	0.51	4.8	0.98	6.7
WD-16A*	1/31/1995	10.0-10.5	FPA	0.12	0.041	0.0081	0.062
WD-17*	1/31/1995	8.0-8.5	FPA	1.0	0.038	0.0048	0.024
WD-17A*	1/31/1995	10.0-10.5	FPA	0.0073	0.0041	ND	0.012
GS-1	5/30/1996	13.0-13.5	BES	0.92	1.4	0.37	2.05
GS-2	5/30/1996	10.0-10.5	BES	ND	2.7D	0.62D	5.5D
GS-3	5/30/1996	9.0-9.5	BES	0.88	17	7.8	59
GS-4	5/30/1996	9.0-9.5	BES	0.11D	0.041D	0.037D	1.6D
GS-5	5/30/1996	9.0-9.5	BES	0.037D	0.047D	ND	0.93D
SD-1	2/3/1998	9.5-10.0	BES	ND	ND	ND	ND
SD-2	2/3/1998	4.0-4.5	BES	ND	1.5	ND	ND
SD-3	2/3/1998	5.5-6.0	BES	ND	0.23	0.31	2.2
SD-5	2/3/1998	5.5-6.0	BES	2.5	31	15	94
SD-6	2/3/1998	5.5-6.0	BES	3.6	26	6.3	37
SD-7	3/16/1999	5.5-6.0	BES	0.93	ND	0.33 J	0.56
SD-8	3/16/1999	5.5-6.0	BES	ND	ND	ND	ND
SD-9	3/16/1999	5.5-6.0	BES	ND	ND	ND	ND
SS-501-1	5/7/2001	5.5-6.0	BES	2.2	20.1	3.8	24.8
SS-501-1D	5/7/2001	9.5-10.0	BES	15.8	34.3	7.2	26.1
SS-501-2	5/7/2001	5.5-6.0	BES	4.1	31.8	5.3	40.9

Notes:

NJDEP NON-RES DCSRS: New Jersey Department of Environmental Protection Residential Direct Contact Soil Remediation Standard; N.J.A.C. 7:26D, last amended May 7, 2012

NJDEP RES DCSRS: New Jersey Department of Environmental Protection Non-Residential Direct Contact Soil Remediation Standard; N.J.A.C. 7:26D, last amended May 7, 2012

NJDEP IGWSSC: New Jersey Department of Environmental Protection Impact to Groundwater Soil Cleanup Criteria; N.J.A.C. 7:26D (May/1999)

NJDEP IGWSSL: New Jersey Department of Environmental Protection Default Impact to Groundwater Soil Screening Levels; N.J.A.C. 7:26D (Dec/2008 latest revision)

NA: Not Analyzed

ND: Not Detected

D: Concentration results based on a diluted analysis

J: Concentration results based on an estimated value

B: Analyte was found in the associated method blank as well as in the sample, indicating probable laboratory contamination

FPA: French and Parrello Associates, P.A.

BES: Brinkerhoff Environmental Services

fbs: Feet below grade surface

Bold and shaded concentrations exceed the most stringent NJDEP standard

*: Soils remediated during later excavation events

Table 2

Walnford Park Maintenance Facility
 Allentown (Upper Freehold) Township
 Monmouth County, New Jersey
 Summary of Historic Groundwater Sample Analytical Results
 April 17, 1995 - April 30, 2001

Monitoring Well	Sampling Date	Collected By	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
	NJDEP GWQS		1	600	700	1000	~	70
MW-2	5/26/1998	BES	NS	NS	NS	NS	NR	NS
	2/13/1998	BES	ND	ND	ND	ND	NR	ND
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
	4/17/1995	FPA	NA	NA	NA	NA	NR	NA
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
MW-3	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
	5/26/1998	BES	NS	NS	NS	NS	NS	NS
MW-4	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
	5/26/1998	BES	NS	NS	NS	NS	NS	NS

Table 2

Wainford Park Maintenance Facility
 Allentown (Upper Freehold) Township
 Monmouth County, New Jersey
 Summary of Historic Groundwater Sample Analytical Results
 April 17, 1995 - April 30, 2001

Monitoring Well	Sampling Date	Collected By	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
	NJDEP GWQS		1	600	700	1000	~	70
MW-5	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	8/6/1996	BES	ND	0.9	ND	ND	NR	ND
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
MW-6	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	4/17/1995	BES	ND	ND	ND	ND	NR	ND
	3/28/1995	BES	ND	ND	ND	ND	NR	ND
	4/30/2001	BES	55	45	3	64	NR	1.8
MW-7	3/30/1999	BES	6	ND	1.2	ND	NR	15
	5/26/1998	BES	23	0.9	1.3	3.6	NR	ND
	2/13/1998	BES	40	2.2	10	7.1	NR	150
	8/6/1996	BES	110	45	19	47	NR	ND

Table 2
Walnford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Historic Groundwater Sample Analytical Results
April 17, 1995 - April 30, 2001

Monitoring Well	Sampling Date	Collected By	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
	NJDEP GWQS		1	600	700	1000	~	70
MW-8	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	ND	ND	ND	ND	NR	ND
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
MW-9*	4/30/2001	BES	1.3	2.1	ND	ND	NR	ND
	3/30/1999	BES	990	18	130	63	NR	ND
MW-1*	4/17/1995	FPA	11,000	8,900	600	3,700	NR	9,200
	3/28/1995	FPA	9,900	8,700	790	4,000	NR	10,000
Potable Well	5/7/2001	BES	ND	ND	ND	ND	ND	ND
	2/18/1998	BES	ND	ND	ND	ND	ND	ND

Notes:

NJDEP GWQS: New Jersey Department of Environmental Protection Groundwater Quality Standard; N.J.A.C. 7:9C, last amended July 22, 2010

TICs: Tentatively Identified Compounds

MTBE: Methyl tert-butyl ether

~: No standard established

NS: Not sampled

ND: Not detected

NR: Not reported

BES: Brinkerhoff Environmental Services

FPA: French and Parrello Associates, P.A.

*: Monitoring Well MW-1 destroyed, MW-9 replaced MW-1 in 2001.

Bold and shaded concentrations indicate compound above GWQS

Table 3

Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Groundwater Elevation Summary
September 5, 2012

Well	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8*	MW-9
Diameter (in)	4	4	4	4	4	4	4	4
TIC (ft amsl)^	96.03	93.37	91.27	92.83	96.25	95.02	92.4	94.63
DTW (ft)	8.01	5.05	3.97	12.56	9.17	8.26	NM	7
GWE (ft amsl)	88.02	88.32	87.3	80.27	87.08	86.76	NM	87.63

Notes:

ft - feet

amsl - above mean sea level in North American Vertical Datum 1988 (NAVD88)

in - inches

DTW - depth to water

GWE - groundwater elevation

TIC - top of inner casing

NM - not measured

* - Indicates monitoring well MW-8 could not be located in the field

^ - Indicates date obtained from BES's June 25, 1999 Remedial Action Workplan Addendum

Table 4
Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Groundwater Monitoring Physiochemical Parameters
September 5, 2012

Well	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8*	MW-9
Diameter (in)	4	4	4	4	4	4	4	4
TIC (ft amsl)^	96.03	93.37	91.27	92.83	96.25	95.02	92.4	94.63
DTW (ft)	8.01	5.05	3.97	12.56	9.17	8.26	NM	7
DTP (ft)	NE	NE	NE	NE	NE	NE	NM	NE
Product Thickness (ft)	NE	NE	NE	NE	NE	NE	NM	NE
GWE (ft amsl)	88.02	88.32	87.3	80.27	87.08	86.76	NM	87.63
TDW (ft)	20.1	13.81	13.8	20.65	13.91	17.6	NM	18.17
Water Column (ft)	12.09	8.76	9.83	8.09	4.74	9.34	NM	11.17
Volume (gal)	7.57	5.48	6.15	5.06	2.97	5.84	NM	6.99
To Purge (gal)	22.70	16.45	18.45	15.19	8.90	17.53	NM	20.97
Pre-Purge Physiochemical Parameters								
Time								
pH	7.14	NM	6.33	4.64	3.76	5.66	NM	6.45
T (°C)	17.79	NM	18.05	16.51	18.59	16.87	NM	18.47
Conductivity (µS/cm)	600	NM	335	163	446	148	NM	283
DO (mg/L)	2.58	NM	3.2	1.53	1.12	1.87	NM	1.54
ORP (mV)	142	NM	194.1	253.3	276.9	197.7	NM	180.7
Turbidity (NTU)	69.1	NM	71.2	95.6	175.4	37.5	NM	109.5
Post-Purge Physiochemical Parameters								
Time								
pH	6.65	NM	6.63	4.79	DRY	5.63	NM	DRY
T (°C)	20.83	NM	23.46	16.51	DRY	16.89	NM	DRY
Conductivity (µS/cm)	524	NM	342	157	DRY	116	NM	DRY
DO (mg/L)	5.35	NM	3.85	1.61	DRY	4.5	NM	DRY
ORP (mV)	180	NM	161.2	251.6	DRY	193.5	NM	DRY
Turbidity (NTU)	246.7	NM	23.8	35.7	DRY	47.35	NM	DRY
Sampling Physiochemical Parameters								
Time								
pH	6.54	NM	6.69	4.86	4.32	5.83	NM	6.49
T (°C)	21	NM	23.7	16.56	18.56	17.94	NM	16.97
Conductivity (µS/cm)	541	NM	342	158	389	117	NM	279
DO (mg/L)	5.21	NM	4.35	1.75	1.78	4.25	NM	5.15
ORP (mV)	173.2	NM	159.9	251.3	269.8	193.2	NM	169.5
Turbidity (NTU)	139.3	NM	25.9	52.6	21.3	78.4	NM	23.6
DTW (ft)	9.97	NM	5.42	17.76	9.56	10.01	NM	10.11

Notes:

ft - feet

amsl - above mean sea level in North American Vertical Datum 1988 (NAVD88)

in - inches

gal - gallons

°C - degrees Celcius

µS/cm - micro Siemens per centimeter

mg/L - milligrams per liter

mV - millivolts

* - Indicates monitoring well MW-8 could not be located in the field

^ - Indicates date obtained from BES's June 25, 1999 Remedial Action Workplan Addendum

NE - not encountered

NTU - Nephelometric Turbidity Unit

DTW - depth to water

GWE - groundwater elevation

DTP - depth to product

TDW - total depth of well

TIC - top of inner casing

NM - not measured

DRY - well went dry during purging

Table 5
Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Analytical Methods and Quality Assurance
September 5, 2012

Location	Sample Date	Sample Time	Matrix	Sample No.	Sample Depth (ft bgs)	Lab ID	Sample Container	Sample Preservation	Holding Time	Analytical Method	Analysis
MW-2	9/5/12	15:00	GW	1224904	NA	09035-004	40 mL Vial/1 L Amber	cool, 4°C, HCL	14 days	EPA 8260B/8011/8070C	TCL VOCs+TICs/TBA/EDB/BN+SIMs+TICs
MW-4	9/5/12	14:15	GW	1224902	NA	09035-002	40 mL Vial/1 L Amber	cool, 4°C, HCL	14 days	EPA 8260B/8011/8070C	TCL VOCs+TICs/TBA/EDB/BN+SIMs+TICs
MW-5	9/5/12	13:15	GW	1224901	NA	09035-001	40 mL Vial	cool, 4°C, HCL	14 days	EPA 8260B/8011	TCL VOCs+TICs/TBA/EDB
MW-6	9/5/12	14:30	GW	1224905	NA	09035-003	40 mL Vial	cool, 4°C, HCL	14 days	EPA 8260B/8011	TCL VOCs+TICs/TBA/EDB
MW-7	9/5/12	16:23	GW	1224907	NA	09035-007	40 mL Vial	cool, 4°C, HCL	14 days	EPA 8260B/8011	TCL VOCs+TICs/TBA/EDB
MW-9	9/5/12	15:47	GW	1224906	NA	09035-006	40 mL Vial	cool, 4°C, HCL	14 days	EPA 8260B/8011	TCL VOCs+TICs/TBA/EDB
FB	9/5/12	15:30	Blank	1224907	NA	09035-005	40 mL Vial/1 L Amber	cool, 4°C, HCL	14 days	EPA 8260B/8011/8070C	TCL VOCs+TICs/TBA/EDB/BN+SIMs+TICs
TB	9/5/12	NA	Blank	1224908	NA	09035-008	40 mL Vial	cool, 4°C, HCL	14 days	EPA 8260B/8011	TCL VOCs+TICs/TBA/EDB

Notes:

TAL - Target Analyte List
EPA - United States Environmental Protection Agency
VOCs - Volatile Organic Compounds
NA - Not Applicable
BNA - Base Neutrals
EDB - Ethylenedibromide
HCL - Hydrochloric Acid
mL - Milliliter
L - Liter
GW - Groundwater
ft bgs - feet below ground surface
TICs - tentatively identified library search compounds (+15 for VOCs and BNs)
SIMs - Selected Ion Monitoring Gas Chromatography/Mass Spectrometry

Table 6
Walnford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Groundwater Sample Analytical Results
September 5, 2012

Sample # Field ID: Lab ID: Date Sampled: Depth(ft):	HIGHER OF PQLs and GWQS Jul-10 (ug/L)	Vapor Intrusion Screening Levels (ug/L)	1224904 MW-2 09035-004 09/05/2012	1224902 MW-4 09035-002 09/05/2012	1224901 MW-5 09035-001 09/05/2012	1224903 MW-6 09035-003 09/05/2012	1224907 MW-7 09035-007 09/05/2012	1224906 MW-9 09035-006 09/05/2012	1224905 FB 09035-005 09/05/2012	1224908 TB 09035-008 09/05/2012	
	CAS		Conc	Q	MDL	Conc	Q	MDL	Conc	Q	MDL
Volatiles (ppb)	75-71-8	1000	ND	0.260	ND	0.260	ND	0.260	ND	0.260	ND
	74-87-3	NS	ND	0.360	ND	0.360	ND	0.360	ND	0.360	ND
Chloromethane	75-01-4	1	ND	0.330	ND	0.330	ND	0.330	ND	0.330	ND
Vinyl chloride	75-01-4	10	ND	0.400	ND	0.400	ND	0.400	ND	0.400	ND
Bromomethane	74-83-9	10	ND	0.400	ND	0.400	ND	0.400	ND	0.400	ND
Chloroethane	75-00-3	5	ND	0.400	ND	0.400	ND	0.400	ND	0.400	ND
Trichlorofluoromethane	75-69-4	2000	ND	0.340	ND	0.340	ND	0.340	ND	0.340	ND
1,1-Dichloroethene	75-35-4	1	ND	0.310	ND	0.310	ND	0.310	ND	0.310	ND
Acetone	67-64-1	6000	11.0	0.330	9.52	0.330	7.33	0.330	21.8	0.330	21.8
Carbon disulfide	75-15-0	700	ND	0.230	ND	0.230	ND	0.230	ND	0.230	ND
Methylene chloride	75-09-2	3	ND	1.98	ND	1.98	ND	1.98	ND	1.98	ND
tert-Butyl alcohol (TBA)	75-65-0	100	ND	0.830	ND	0.830	ND	0.830	ND	0.830	ND
trans-1,2-Dichloroethene	156-60-5	100	ND	0.370	ND	0.370	ND	0.370	ND	0.370	ND
Methyl tert-butyl ether (MTBE)	1634-04-4	70	ND	0.300	ND	0.300	ND	0.300	ND	0.300	ND
1,1-Dichloroethane	75-34-3	50	ND	0.210	ND	0.210	ND	0.210	ND	0.210	ND
cis-1,2-Dichloroethene	156-59-2	70	ND	0.340	ND	0.340	ND	0.340	ND	0.340	ND
2-Butanone (MEK)	78-93-3	300	ND	0.240	ND	0.240	ND	0.240	ND	0.240	ND
Bromochloromethane	74-97-5	NS	ND	0.250	ND	0.250	ND	0.250	ND	0.250	ND
Chloroform	67-66-3	70	ND	0.240	ND	0.240	ND	0.240	ND	0.240	ND
1,1,1-Trichloroethane	71-55-6	30	ND	0.330	ND	0.330	ND	0.330	ND	0.330	ND
Carbon tetrachloride	56-23-5	1	ND	0.270	ND	0.270	ND	0.270	ND	0.270	ND
1,2-Dichloroethane (EDC)	107-06-2	2	ND	0.400	ND	0.400	ND	0.400	ND	0.400	ND
Benzene	71-43-2	1	ND	0.210	ND	0.210	ND	0.210	ND	0.210	ND
Trichloroethene	79-01-6	1	ND	0.280	ND	0.280	ND	0.280	ND	0.280	ND
1,2-Dichloropropane	78-87-5	1	ND	0.290	ND	0.290	ND	0.290	ND	0.290	ND
1,4-Dioxane	123-91-1	10	ND	0.391	ND	0.391	ND	0.391	ND	0.391	ND
Bromodichloromethane	75-27-4	5	ND	0.330	ND	0.330	ND	0.330	ND	0.330	ND
cis-1,3-Dichloropropene	10061-01-5	NS	ND	0.220	ND	0.220	ND	0.220	ND	0.220	ND
4-Methyl-2-pentanone (MIBK)	108-10-1	800000	ND	0.290	ND	0.290	ND	0.290	ND	0.290	ND
Toluene	108-88-3	600	ND	0.230	ND	0.230	ND	0.230	ND	0.230	ND
trans-1,3-Dichloropropene	10061-02-6	NS	ND	0.230	ND	0.230	ND	0.230	ND	0.230	ND
1,1,2-Trichloroethane	79-00-5	3	ND	0.210	ND	0.210	ND	0.210	ND	0.210	ND
Tetrachloroethene	127-18-4	1	ND	0.220	ND	0.220	ND	0.220	ND	0.220	ND
2-Hexanone	591-78-6	300	2.97	0.390	8.77	0.390	6.49	0.390	4.52	0.390	4.52
Dibromochloromethane	124-48-1	1	ND	0.250	ND	0.250	ND	0.250	ND	0.250	ND
1,2-Dibromooethane (EDB)	106-93-4	0.03	ND	0.00855	ND	0.00855	ND	0.00855	ND	0.00855	ND
Chlorobenzene	108-90-7	50	ND	0.220	ND	0.220	ND	0.220	ND	0.220	ND
Ethylbenzene	100-41-4	700	ND	0.290	ND	0.290	ND	0.290	ND	0.290	ND
Total Xylenes	1330-20-7	1000	ND	0.680	ND	0.680	ND	0.680	ND	0.680	ND
Styrene	100-42-5	100	ND	0.240	ND	0.240	ND	0.240	ND	0.240	ND
Bromobenzene	75-25-2	4	ND	0.260	ND	0.260	ND	0.260	ND	0.260	ND
Isopropylbenzene	98-82-8	700	ND	0.210	ND	0.210	ND	0.210	ND	0.210	ND

Table 6
Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Groundwater Sample Analytical Results
September 5, 2012

Sample #/ Field ID/ Lab ID/ Date Sampled/ Depth (ft)	CAS	HIGHER OF PQLs and GWQS Jul-10 (ug/L)	Vapor Intrusion Screening Levels (ug/L)	1224904 MW-2 09035-004 09/05/2012	1224902 MW-4 09035-002 09/05/2012	1224901 MW-5 09035-001 09/05/2012	1224903 MW-6 09035-003 09/05/2012	1224907 MW-7 09035-007 09/05/2012	1224906 MW-9 09035-006 09/05/2012	1224905 FB 09035-005 09/05/2012	1214908 TB 09035-008 09/05/2012
1,1,2,2-Tetrachloroethane	79-34-5	1	4	ND	0.330	ND	0.330	ND	ND	0.330	ND
1,3-Dichlorobenzene	541-73-1	600	600	ND	0.250	ND	0.250	ND	ND	0.250	ND
1,4-Dichlorobenzene	106-46-7	75	75	ND	0.220	ND	0.220	ND	ND	0.220	ND
1,2-Dichlorobenzene	95-50-1	600	5900	ND	0.240	ND	0.240	ND	ND	0.240	ND
1,2-Dibromo-3-chloropropane	96-12-8	0.02	NS	ND	0.00855	ND	0.00855	ND	0.00855	0.00855	ND
1,2,4-Trichlorobenzene	120-82-1	9	2800	ND	0.270	ND	0.270	ND	ND	0.270	ND
1,2,3-Trichlorobenzene	87-61-6	NS	NS	ND	0.480	ND	0.480	ND	ND	0.480	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	NS	2400	ND	0.210	ND	0.210	ND	ND	0.210	ND
Methyl acetate	79-20-9	7000		ND	0.210	ND	0.210	ND	ND	0.210	ND
Cyclohexane	110-82-7	NS	1200	ND	0.360	ND	0.360	ND	ND	0.360	ND
Methylcyclohexane	108-87-2	NS	NS	ND	0.600	ND	0.600	ND	ND	0.600	ND
1,3-Dichloropropene (cis- and trans-)	542-75-6	1	NS	ND	0.230	ND	0.230	ND	ND	0.230	ND
TOTAL VOCs		NS	NS	14.0	18.3	12.9	13.6	29.1	21.8	ND	ND
TOTAL TICs		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
TOTAL VOCs & TICs		NS	NS	14.0	18.3	12.9	13.6	29.1	21.8	ND	ND
Semivolatiles - 8N (ppb)											
Benzaldehyde	100-52-7	NS	NS	ND	0.880	ND	0.880	ND	ND	0.880	ND
Big(2-chloromethyl) ether	111-44-4	7	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
Big(2-chloroisopropyl) ether	108-60-1	300	NS	ND	0.140	ND	0.140	ND	ND	0.140	ND
N-Nitrosodi-n-propylamine	621-64-7	10	NS	ND	0.150	ND	0.150	ND	ND	0.150	ND
Acetophenone	98-86-2	700	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
Hexachloroethane	67-72-1	7	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
Nitrobenzene	98-95-3	6	NS	ND	0.120	ND	0.120	ND	ND	0.120	ND
Isophorone	78-59-1	40	NS	ND	0.110	ND	0.110	ND	ND	0.110	ND
Big(2-chloroethoxy) methane	111-91-1	NS	NS	ND	0.080	ND	0.080	ND	ND	0.080	ND
Naphthalene	91-20-3	300	NS	ND	0.175	ND	0.175	ND	ND	0.175	ND
4-Chloroaniline	106-47-8	30	NS	ND	0.150	ND	0.150	ND	ND	0.150	ND
Hexachlorobutadiene	87-68-3	1	NS	ND	0.120	ND	0.120	ND	ND	0.120	ND
Caproalactam	105-60-2	5000	NS	ND	0.170	ND	0.170	ND	ND	0.170	ND
2-Methylnaphthalene	91-57-6	30	NS	ND	0.109	ND	0.109	ND	ND	0.109	ND
Hexachlorocyclopentadiene	77-47-4	40	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
1,1-Biphenyl	92-52-4	400	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
2-Chloronaphthalene	91-58-7	600	NS	ND	0.090	ND	0.090	ND	ND	0.090	ND
2-Nitroaniline	88-74-4	NS	NS	ND	0.130	ND	0.130	ND	ND	0.130	ND
Dimethyl phthalate	131-11-3	100	NS	ND	0.120	ND	0.120	ND	ND	0.120	ND
2,6-Dinitrotoluene	606-20-2	NS	NS	ND	0.120	ND	0.120	ND	ND	0.120	ND
Acenaphthylene	208-96-8	100	NS	ND	0.113	ND	0.113	ND	ND	0.113	ND
3-Nitroaniline	99-09-2	NS	NS	ND	0.130	ND	0.130	ND	ND	0.130	ND
Acenaphthene	83-32-9	400	NS	ND	0.100	ND	0.100	ND	ND	0.100	ND
2,4-Dinitrotoluene	121-14-2	NS	NS	ND	0.180	ND	0.180	ND	ND	0.180	ND
Dibenzofuran	132-64-9	NS	NS	ND	0.130	ND	0.130	ND	ND	0.130	ND
Diethyl phthalate	84-66-2	6000	NS	ND	0.190	ND	0.190	ND	ND	0.190	ND
Fluorene	86-73-7	300	NS	ND	0.145	ND	0.145	ND	ND	0.145	ND

Table 6
Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Groundwater Sample Analytical Results
September 5, 2012

Sample #/ Field ID: Lab ID: Date Sampled: Depth (ft):	CAS	HICHER OF PQLs and GWQS 1st-10 (ug/L)	Vapor Intrusion GW Screening Levels (ug/L)	1224904 MW-2 09035-004 09/05/2012	1224902 MW-4 09035-002 09/05/2012	1224901 MW-5 09035-001 09/05/2012	1224903 MW-6 09035-003 09/05/2012	1224907 MW-7 09035-007 09/05/2012	1224906 MW-9 09035-006 09/05/2012	1224905 FB 09035-005 09/05/2012	1224908 TB 09035-008 09/05/2012
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	100-01-6	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	86-30-6	10	NS	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	101-55-3	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	118-74-1	0.02	NS	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine	1912-24-9	3	NS	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	85-01-8	100	NS	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	120-12-7	2000	NS	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	86-74-8	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	84-74-2	700	NS	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	206-44-0	300	NS	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	129-00-0	200	NS	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	85-68-7	100	NS	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	91-94-1	30	NS	ND	ND	ND	ND	ND	ND	ND	ND
Benzofluoranthene	56-55-3	0.1	NS	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	218-01-9	5	NS	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	117-81-7	3	NS	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	117-84-0	100	NS	ND	ND	ND	ND	ND	ND	ND	ND
Benzofluoranthene	205-99-2	0.2	NS	ND	ND	ND	ND	ND	ND	ND	ND
Benzofluoranthene	207-08-9	0.5	NS	ND	ND	ND	ND	ND	ND	ND	ND
Benzofluoranthene	50-32-8	0.1	NS	ND	ND	ND	ND	ND	ND	ND	ND
Indene (1,2,3-cd)pyrene	193-39-5	0.2	NS	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	53-70-3	0.3	NS	ND	ND	ND	ND	ND	ND	ND	ND
Benzofluoranthene	191-24-2	100	NS	ND	ND	ND	ND	ND	ND	ND	ND
Dinitrofluorene (2,4- and 2,6-)	25321-14-6	10	NS	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL BNS		NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL TICs		NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL BNS & TICs		NS	NS	ND	ND	ND	ND	ND	ND	ND	ND
Notes:											
NS - No Standards Available											
-- Indication analyte not credited											
ND - Indication Not Detected at the MDL											
* - Indicates compound analyzed by Method 8011											
Bold - Indicates MDL exceeds the respective NJDEP GWQC											
PQL - Practical Quantitation Limit											
GWQS - NJDEP Groundwater Quality Standard, N.J.A.C. 7:9C, last amended July 22, 2010											
MDL - Laboratory Method Detection Limit											
Conc. - Reported Concentration											

Table 7

Wainford Park Maintenance Facility
 Allentown (Upper Freehold) Township
 Monmouth County, New Jersey
 Summary of Historic Groundwater Sample Analytical Results to Date
 April 17, 1995 - September 5, 2012

Monitoring Well	Sampling Date	Collected by	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
NJDEP GWQS			Results in parts per billion (ppb)					
MW-2	9/5/2012	NA	1	600	700	1000	~	70
	5/26/1998	BES	ND	ND	ND	ND	ND	ND
	2/13/1998	BES	NS	NS	NS	NS	NR	NS
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	NA	NA	NA	NA	NR	NA
MW-3	9/5/2012	NA	ND	ND	ND	ND	NR	ND
	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
	9/5/2012	NA	ND	ND	ND	ND	ND	ND
MW-4	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
	9/5/2012	NA	ND	ND	ND	ND	ND	ND

Table 7

Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Historic Groundwater Sample Analytical Results to Date
April 17, 1995 - September 5, 2012

Monitoring Well	Sampling Date	Collected by	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
	NJDEP GWQS		1	600	700	1000	~	70
MW-5	9/5/2012	NA	ND	ND	ND	ND	ND	ND
	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	8/6/1996	BES	ND	0.9	ND	ND	NR	ND
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
MW-6	9/5/2012	NA	ND	ND	ND	ND	ND	ND
	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	NS	NS	NS	NS	NS	NS
	4/17/1995	FPA	ND	ND	ND	ND	NR	ND
	3/28/1995	FPA	ND	ND	ND	ND	NR	ND
	9/5/2012	NA	ND	ND	ND	ND	ND	ND
MW-7	4/30/2001	BES	55	45	3	64	NR	1.8
	3/30/1999	BES	6	ND	1.2	ND	NR	15
	5/26/1998	BES	23	0.9	1.3	3.6	NR	ND
	2/13/1998	BES	40	2.2	10	7.1	NR	150
	8/6/1996	BES	110	45	19	47	NR	ND

Table 7

Wainford Park Maintenance Facility
Allentown (Upper Freehold) Township
Monmouth County, New Jersey
Summary of Historic Groundwater Sample Analytical Results to Date
April 17, 1995 - September 5, 2012

Monitoring Well	Sampling Date	Collected by	Benzene	Toluene	Ethylbenzene	Total Xylenes	TICs	MTBE
	NJDEP GWQS		Results reported in parts per billion (ppb)					
			1	600	700	1000	~	70
MW-8	5/26/1998	BES	NS	NS	NS	NS	NS	NS
	2/13/1998	BES	ND	ND	ND	ND	NR	ND
	8/6/1996	BES	ND	ND	ND	ND	NR	ND
MW-9*	9/5/2012	NA	ND	ND	ND	ND	ND	ND
	4/30/2001	BES	1.3	2.1	ND	ND	NR	ND
	3/30/1999	BES	990	18	130	63	NR	ND
MW-1*	4/17/1995	FPA	11,000	8,900	600	3,700	NR	9,200
	3/28/1995	FPA	9,900	8,700	790	4,000	NR	10,000
Potable Well	5/7/2001	BES	ND	ND	ND	ND	ND	ND
	2/13/1998	BES	ND	ND	ND	ND	ND	ND

Notes:

NJDEP GWQS: New Jersey Department of Environmental Protection Groundwater Quality Standard, N.J.A.C. 7:9C, last amended July 22, 2010

TICs: Tentatively Identified Compounds

MTBE: Methyl tert-butyl ether

~: No standard established

NS: Not sampled

ND: Not detected

NR: Not reported

NA: T.O. Najarian Associates, Inc.

BES: Brinkerhoff Environmental Services

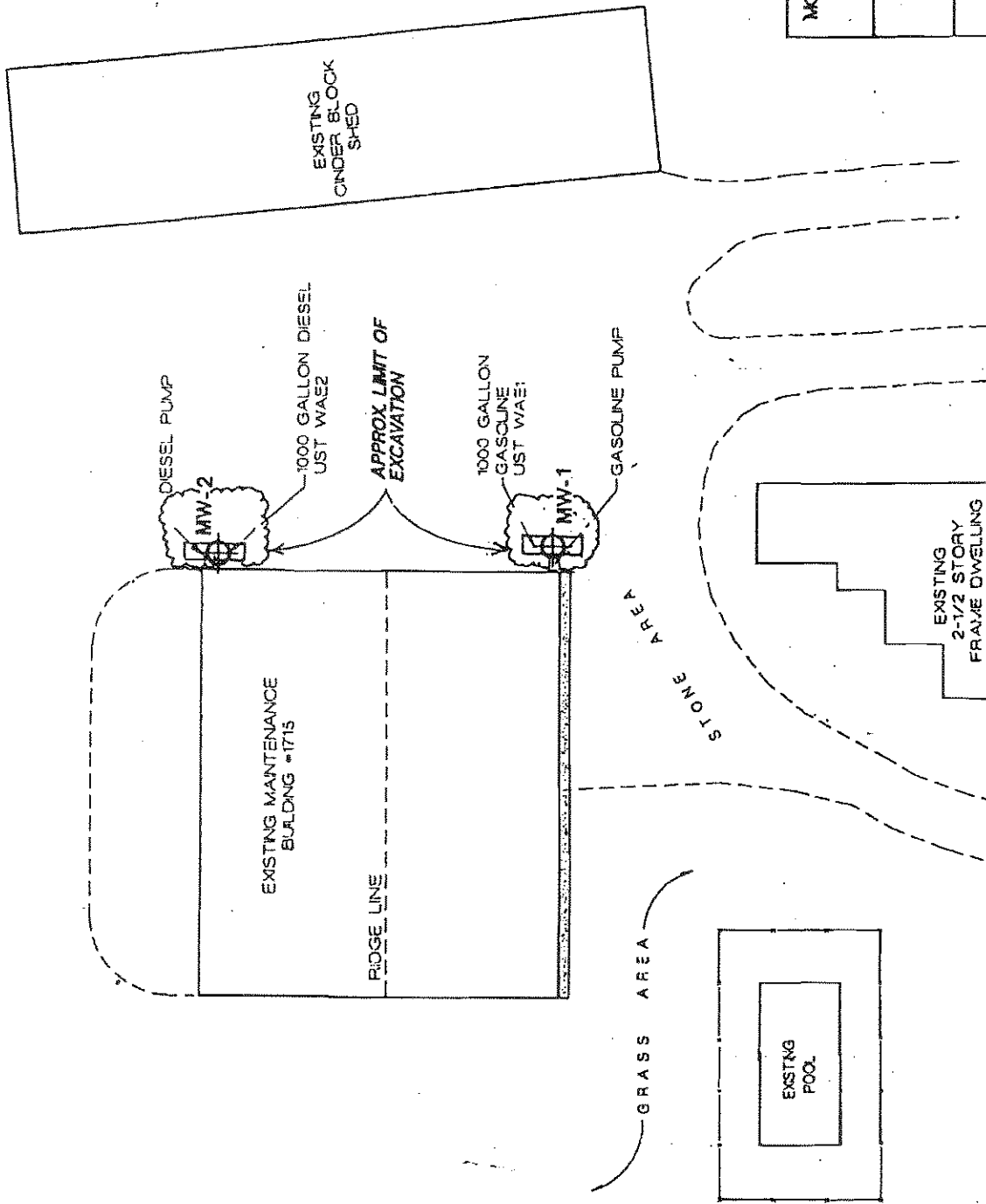
FPA: French and Parrello Associates, P.A.

*: Monitoring Well MW-1 destroyed, MW-9 replaced MW-1 in 2001.

Bold and shaded concentrations indicate compound above GWQS

APPENDIX A

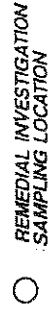
FRENCH AND PARRELLO ASSOCIATES: FIGURES AND TABLES



MONMOUTH COUNTY PARK SYSTEM BOARD OF RECREATION COMMISSIONERS	
PLANS FOR THE REMOVAL AND REPLACEMENT OF STORAGE TANKS	
WALNFORD PARK SITE PLAN	
FPA FRENCH & PARFELLO CONSULTING ENGINEERS 675 NORTH BROAD STREET SUITE 410 JERSEY CITY, NJ 07310	
DATE: 7-1-80	SCALE: AS SHOWN
JOB NO. 950723	SHEET NO. 2



LEGEND:

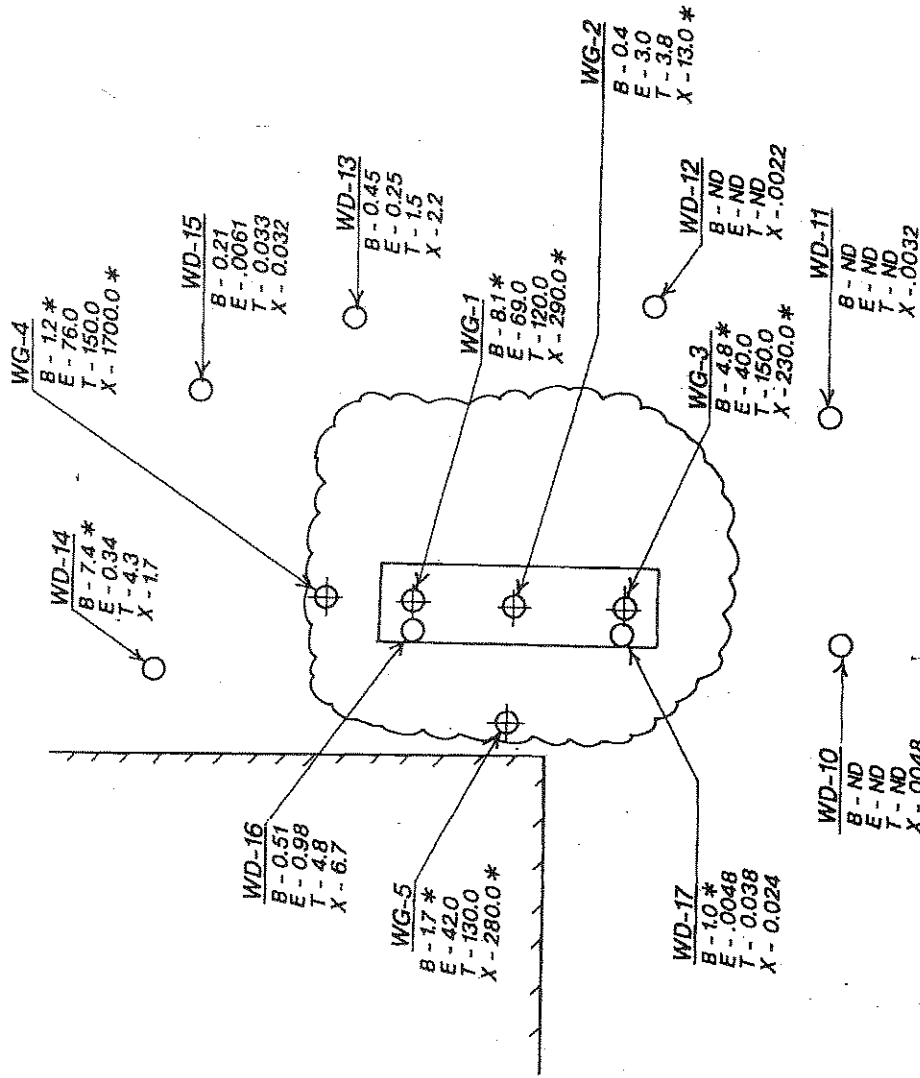


B = BENZENE
E = ETHYLBENZENE
T = TOLUENE
X = XYLENES

NS = NOT SAMPLED
ND = NON DETECT

* = ABOVE STANDARD

NOTE: ALL UNITS ARE PPM



MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK - GASOLINE UST

SAMPLING RESULTS AT 8 - 8.5'

FRENCH & PARRELL
ASSOCIATES, P.A.
CONSULTING ENGINEERS
870 NORTH BEERS STREET, SUITE 201, HOLMDEL, NEW JERSEY

DATE: JUNE/7/1995
JOB NO. 92E072E
SCALE: AS SHOWN
DWG. NO. 5



LEGEND:

⊙ POST EXCAVATION SAMPLING LOCATION

○ REMEDIAL INVESTIGATION SAMPLING LOCATION

B = BENZENE

E = ETHYLBENZENE

T = TOLUENE

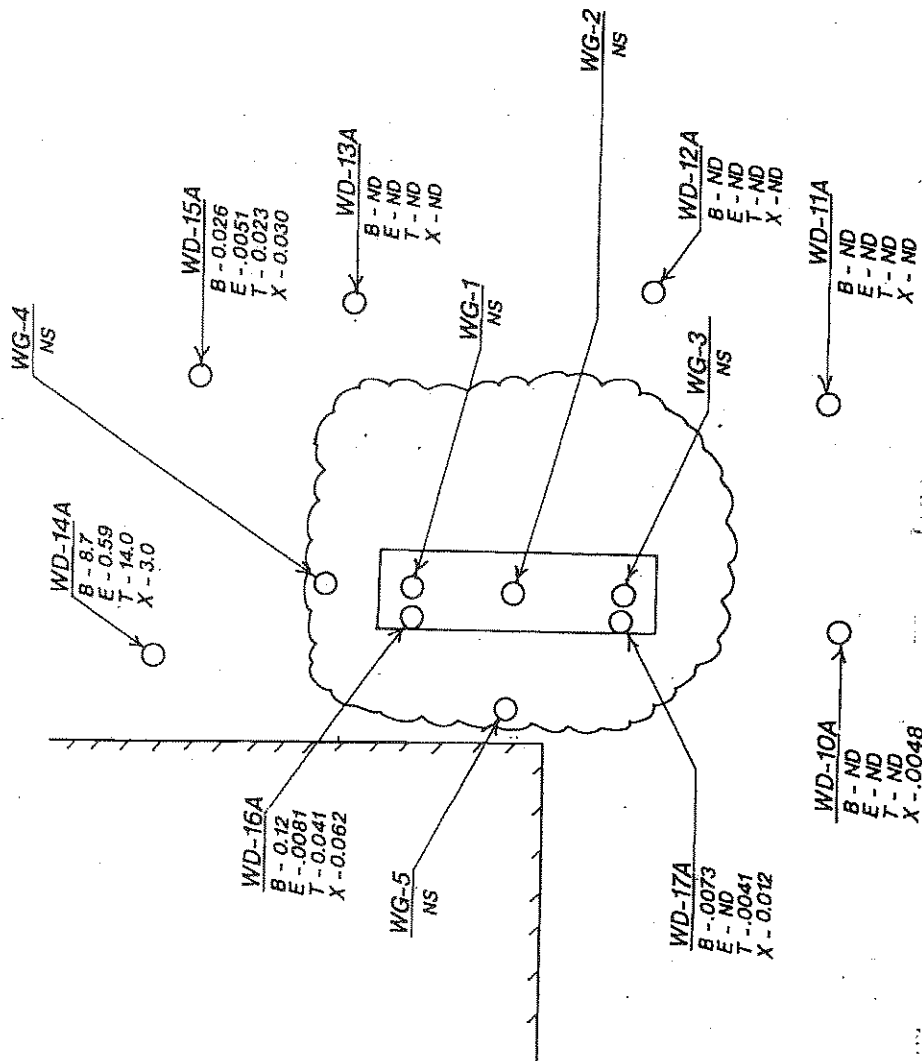
X = XYLENES

NS = NOT SAMPLED

ND = NON DETECT

* = ABOVE STANDARD

NOTE: ALL UNITS ARE PPM



MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNFORD PARK - GASOLINE UST

SAMPLING RESULTS AT 10 - 10.5'

FRENCH & PAPPARELLO
ASSOCIATES P.A.
CONSULTING ENGINEERS
370 NORTH BEERS STREET, BLDG. #1, HOLMDEL, NEW JERSEY

DATE: JUNE 7/1995
SCALE: AS SHOWN
JOB NO. 92E072E
DWG. NO. 5A



LEGEND:

⊕ POST EXCAVATION SAMPLING LOCATION

○ REMEDIAL INVESTIGATION SAMPLING LOCATION

B = BENZENE

E = ETHYLBENZENE

T = TOLUENE

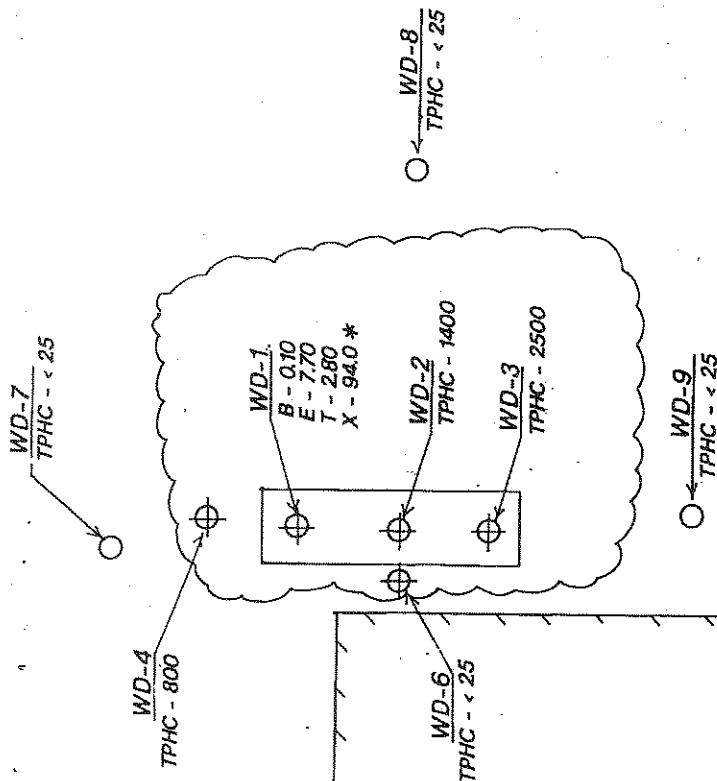
X = XYLENES

NS = NOT SAMPLED

ND = NON DETECT

* = ABOVE STANDARD

NOTE: ALL UNITS ARE PPM



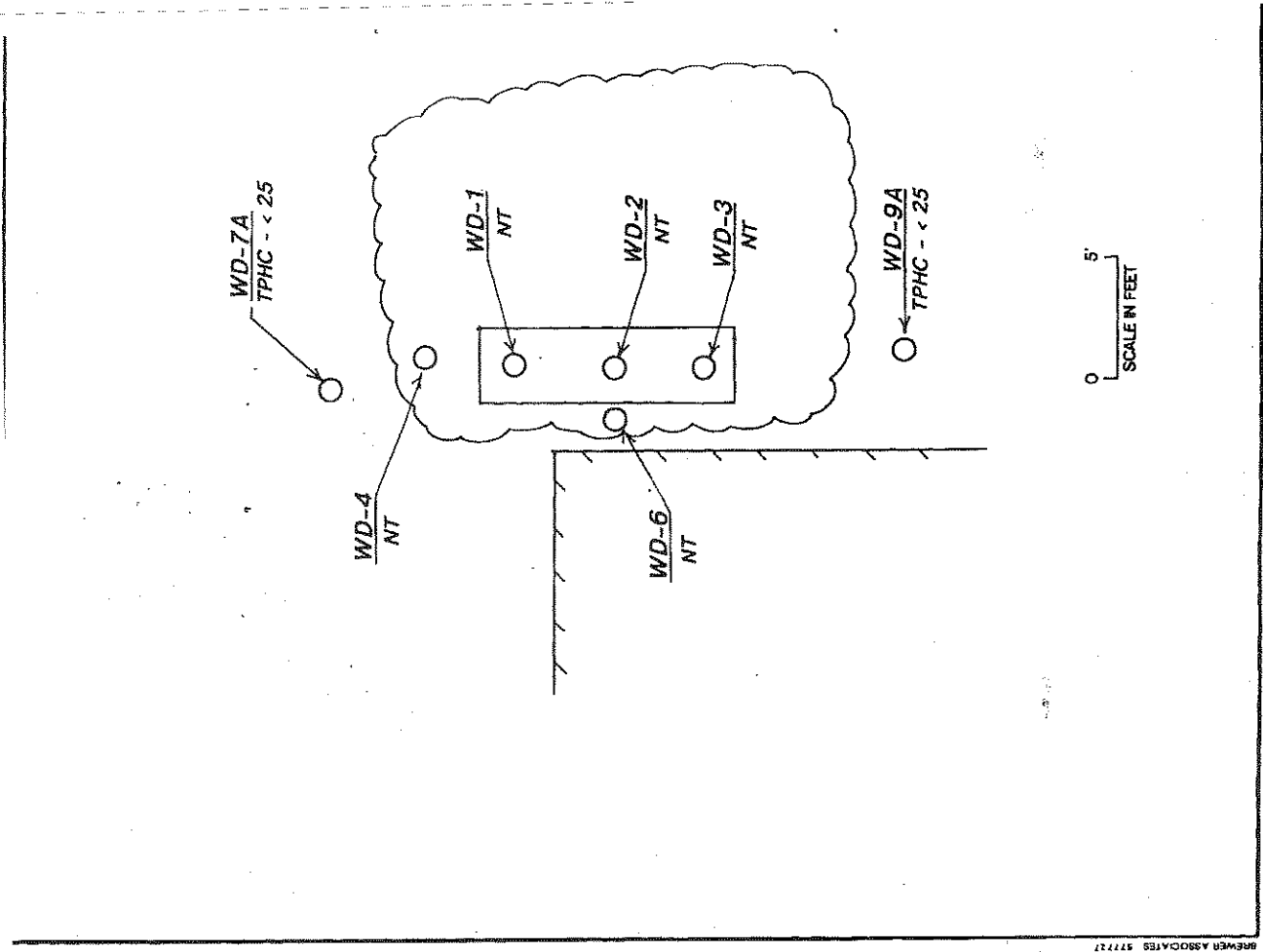
0 5'
SCALE IN FEET

MONMOUTH COUNTY PARK SYSTEM
BOARD OF RECREATION COMMISSIONERS
WALNORD PARK - DIESEL UST

SAMPLING RESULTS AT 8 - 8.5'

FRENCH & PARRELLO
ASSOCIATES P.A.
CONSULTING ENGINEERS
170 NORTH BEERS STREET, BLDG. # 1, HOLMDEL, NEW JERSEY

DATE: JUNE 7/1995	SCALE: AS SHOWN
JOB NO. 925072E	DWG. NO. 6



BREWER ASSOCIATES 577727

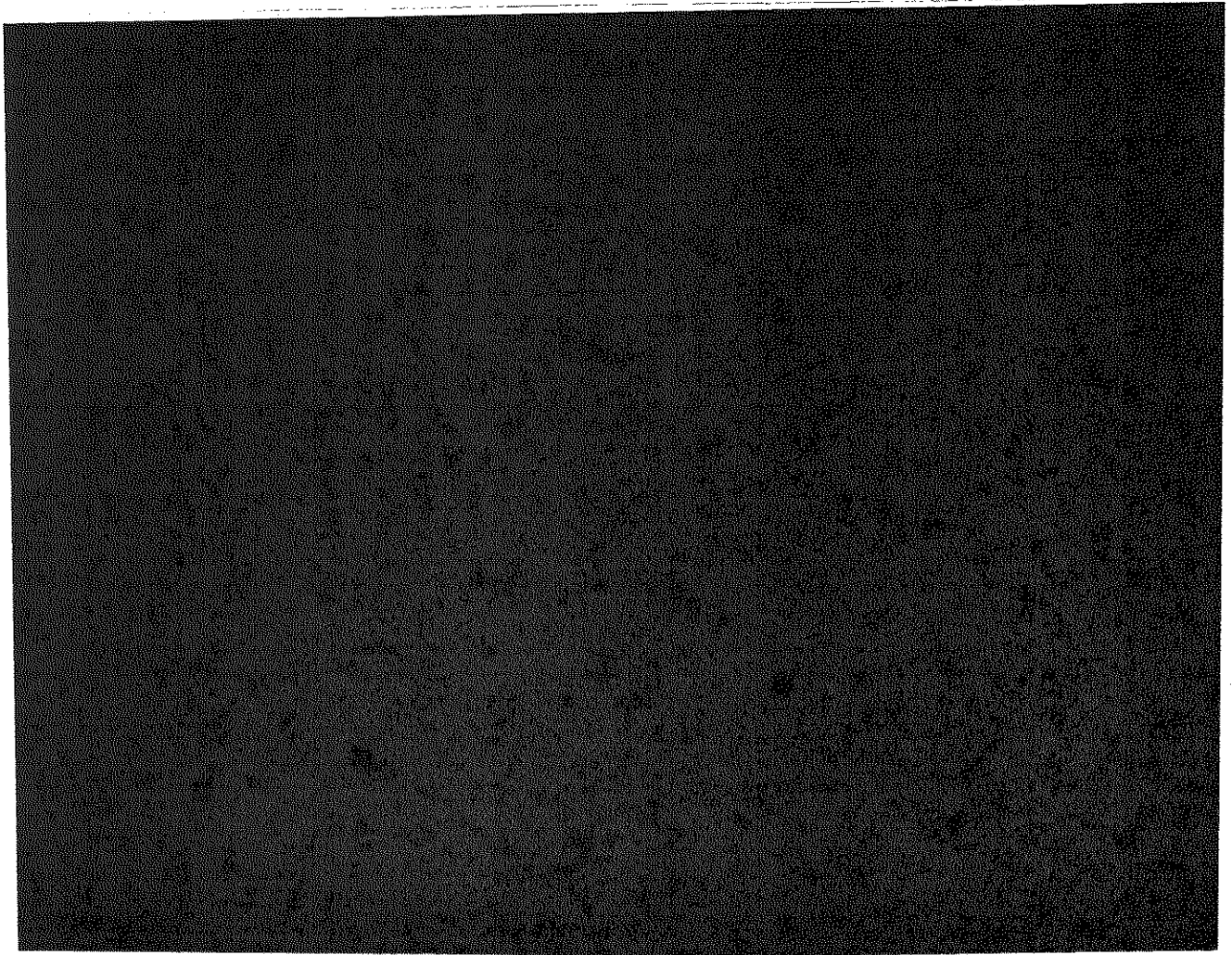


TABLE NO. 6
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLING-GASOLINE UST

PARAMETER		BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS
RESIDENTIAL STANDARD		3	1000	1000	410	
NON-RESIDENTIAL STANDARD		13	1000	1000	1000	
IMPACT TO GROUNDWATER STANDARD		1	100	500	10	
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE			
WG-1	E335537	8.0-8.5'	12-17-93	8.1	69.0	120.0
WG-2	E335538	8.0-8.5'	12-17-93	0.4	3.0	3.8
WG-3	E335539	8.0-8.5'	12-17-93	4.8	40.0	150.0
WG-4	E335540	8.0-8.5'	12-17-93	1.2	76.0	150.0
WG-5	E335541	8.0-8.5'	12-17-93	1.7	42.0	130.0
WG-FB	E335536	N/A	12-17-93	ND	ND	ND
				8.1	290.0	5746.0
				0.4	13.0	63.7
				4.8	230.0	127.4
				1.2	1700.0	939.5
				1.7	280.0	101.8

KEY: 1. All units in PPM
2. ND = Non-Detect
3. Shaded Area = Above Standard

TABLE NO. 6A
WALNORF PARK

TABULATED ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLING-DIESEL UST

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS	TPHC
RESIDENTIAL STANDARD			3	1000	1000	410	--	10000
NON-RESIDENTIAL STANDARD			13	1000	1000	1000	--	--
IMPACT TO GROUNDWATER STANDARD			1	100	500	10	--	--
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE					
WD-1	E335531	8.0-8.5'	12-17-93	0.10	7.70	2.80	94.0	117.4
WD-2	E335532	8.0-8.5'	12-17-93	NT	NT	NT	NT	1400
WD-3	E335533	8.0-8.5'	12-17-93	NT	NT	NT	NT	2500
WD-4	E335534	8.0-8.5'	12-17-93	NT	NT	NT	NT	800
WD-6	E335535	8.0-8.5'	12-17-93	NT	NT	NT	NT	<25
WD-FB	E335536	N/A	12-17-93	ND	ND	ND	ND	NT

KEY: 1. All units in PPM
2. ND = Non-Detect
3. Shaded Area = Above Standard
4. NT = Not tested

TABLE No. 7A
WALNFORF PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-DIESEL UST

PARAMETER				TPHC
RESIDENTIAL STANDARD				10000
NON-RESIDENTIAL STANDARD				--
IMPACT TO GROUNDWATER STANDARD				--
YPA SAMPLE NO.	LAB SAMPLE NO.	DEPTH OF SAMPLE	DATE OF SAMPLE	
WD-7	E855-1	8.0-8.5'	1-30-95	<25
WD-7A	E855-2	10-10.5'	1-30-95	<25
WD-8	E855-3	8.0-8.5'	1-30-95	<25
WD-8A	E855-4	10-10.5'	1-30-95	<25
WD-9	E855-5	8.0-8.5'	1-30-95	<25
WD-9A	E855-6	10-10.5'	1-30-95	<25

KEY: 1. All units in PPM

TABLE No. 7
WAINFORD PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD			3	1000	1000	410
NON-RESIDENTIAL STANDARD			13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD			1	100	500	10
FPA SAMPLE NO.	LAB SAMPLE NO.	DEPTH OF SAMPLE	DATE OF SAMPLE			
WD-10	E855-7	8.0-8.5'	1-30-95	ND	ND	.0048
WD-10A	E855-8	10-10.5'	1-30-95	ND	ND	.0038
WD-11	E855-9	8.0-8.5'	1-30-95	ND	ND	.0032
WD-11A	E855-10	10-10.5'	1-30-95	ND	ND	ND
WD-12	E855-11	8.0-8.5'	1-30-95	ND	ND	.0022
WD-12A	E855-12	10-10.5'	1-30-95	ND	ND	ND
WD-13	E855-13	8.0-8.5'	1-30-95	0.45	0.25	1.5
						2.2

TABLE No. 7 (Cont.)
WALNORF PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD			3	1000	1000	410
NON-RESIDENTIAL STANDARD			13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD			1	100	500	10
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE			
WD-13A	E855-14	10-10.5'	1-30-95	0.38	.0047	.014
WD-14	E889-1	8.0-8.5'	1-31-95	7.4	0.34	4.3
WD-14A	E889-2	10-10.5'	1-31-95	8.7	0.59	14.0
WD-15	E889-3	8.0-8.5'	1-31-95	0.21	.0061	0.033
WD-15A	E889-4	10-10.5'	1-31-95	0.026	.0051	0.023
WD-16	E889-5	8.0-8.5'	1-31-95	0.51	0.98	4.8
WD-16A	E889-6	10-10.5'	1-31-95	0.12	.0081	0.041
						0.062

TABLE No. 7 (Cont.)
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SOIL SAMPLING-GASOLINE UST

PARAMETER		BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
RESIDENTIAL STANDARD		3	1000	1000	410
NON-RESIDENTIAL STANDARD		13	1000	1000	1000
IMPACT TO GROUNDWATER STANDARD		1	100	500	10
FPA SAMPLE No.	LAB SAMPLE No.	DEPTH OF SAMPLE	DATE OF SAMPLE		
WD-17	E889-7	8.0-8.5'	1-31-95	1.00	0.024
WD-17A	E889-8	10-10.5'	1-31-95	.0073	0.012
FIELD BLANK	E855-15	N/A	1-30-95	ND	ND
FIELD BLANK	E899-16	N/A	1-31-95	ND	ND

KEY: (1) All units are ppm
(2) WD-10 - Field Number
E855-7 - Lab Number
(3) Shaded = Above Standard

TABLE No. 8
WALNFORD PARK
TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (MONITOR WELL) SITE INVESTIGATION
GASOLINE UST

DATE OF SAMPLE		5-23-94	6-15-94	7-11-94	AVERAGE
FPA SAMPLE NUMBER		MW-1	MW-1	MW-1	--
LAB SAMPLE NUMBER		E415024	E418665	E422195	--
PARAMETER	STANDARD				
BENZENE	1.0	10000	12000	21000	15000
ETHYLBENZENE	700	530	310	1100	647
TOLUENE	1000	9900	7800	20000	12567
XYLENES	40	5600	2500	7100	4317
TOTAL TICS		5300	2000	0	--
MTBE		33000	41000	57000	43667
TBA		ND	ND	ND	--

KEY: (1) All units in PPB
(2) ND = Non detect
(3) Shaded = Above Standard

TABLE No. 8A
WALNFORD PARK
TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (MONITOR WELL) SITE INVESTIGATION
DIESEL UST

DATE OF SAMPLE		5-23-94	6-15-94	7-11-94	AVERAGE
FPA SAMPLE NUMBER		MW-2	MW-2	MW-2	--
LAB SAMPLE NUMBER		E415025	E418666	E422196	--
PARAMETER	STANDARD				
VOLATILE ORGANICS	--	ND	ND	ND	ND
TOTAL VO TICS	--	5	36	9	16.7
BASE NEUTRALS	--	ND	ND	ND	ND
TOTAL BN TICS	--	7	ND	ND	2.3

KEY: (1) All units in PPB
 (2) ND = Non detect
 (3) Shaded = Above Standard

TABLE No. 9
WALNFORD PARK

TABULATED ANALYTICAL RESULTS
GROUNDWATER SAMPLING (HYDROPUNCH) REMEDIAL INVESTIGATION

PARAMETER			BENZENE	ETHYLBENZENE	TOLUENE	XYLENES
STANDARD			1.0	700	1000	40
FPA SAMPLE NUMBER	LAB SAMPLE NUMBER	DATE OF SAMPLE				
HP-1WD	E899-9	1-31-95	ND	1.3	4.6	4.6
HP-2WD	E899-10	1-31-95	ND	ND	ND	ND
HP-3WD	E899-11	1-31-95	ND	ND	ND	ND
HP-4WD	E899-12	1-31-95	ND	ND	2.7	ND
HP-5WD	E899-13	1-31-95	3B	ND	ND	2.7
HP-6WD	E899-14	1-31-95	ND	ND	ND	ND
NW-1WD	E899-15	1-31-95	18000	890	12000	5900
FIELD BLANK	E899-16	1-31-95	ND	ND	ND	ND
TRIP BLANK	E899-17	1-31-95	ND	ND	ND	ND

KEY: (1) ND = Not detected
(2) All values in ug/L
(3) Shaded = Above Standard

TABLE NO. 10
WAINFORD PARK

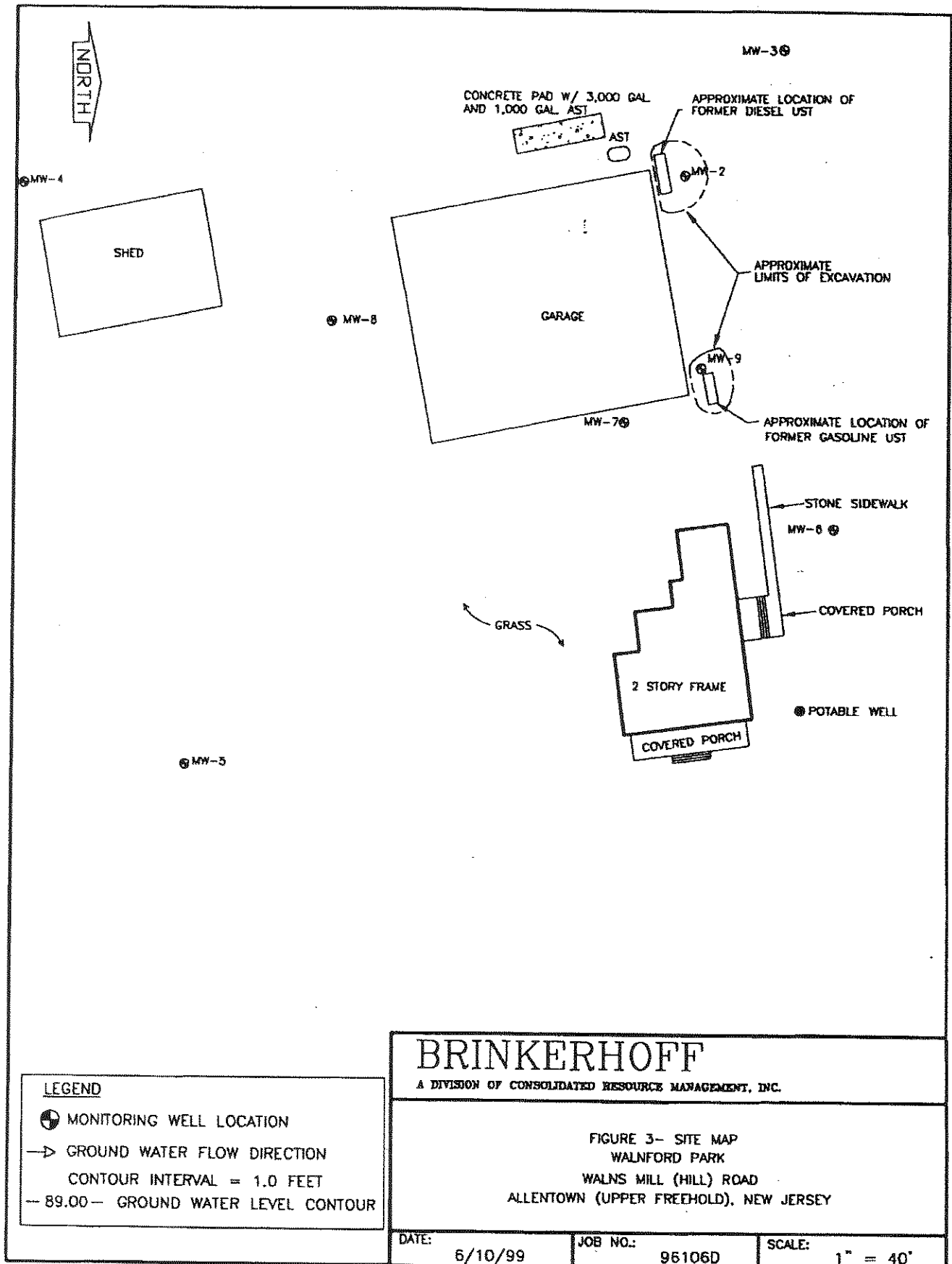
GROUNDWATER SAMPLING (MONITOR WELLS) REMEDIAL INVESTIGATION

PARAMETER		LAB SAMPLE NUMBER		BENZENE	ETHYLBENZENE	TOLUENE	XYLENES	TOTAL TICS	MTBE	TBA
STANDARD				1.0	700	1000	40			
WELL	DATE									
MW-1	3-28-95 4-17-95	E2338-1 E2876-1		9900 * 11000 *	790 * 600	8700 * 8900 *	4000 * 3700 *	1200 2690	10000 9200	ND ND
MW-2	3-28-95 4-17-95	E2338-2 NT		ND NT	ND NT	ND NT	ND NT	ND NT	ND NT	ND NT
MW-3	3-28-95 4-17-95	E2338-3 E2876-2		ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-4	3-28-95 4-17-95	E2338-4 E2876-3		ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-5	3-28-95 4-17-95	E2338-5 E2876-4		ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
MW-6	3-28-95 4-17-95	E2338-6 E2876-5		ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
FIELD BLANK	3-28-95 4-17-95	E2338-7 E2876-6		ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
TRIP BLANK	3-28-95 4-17-95	E2338-8 E2876-7		ND ND	ND ND	ND ND	ND ND	ND ND	NT NT	NT NT

KEY: NT = Not Tested
ND = Not Detected
* = Above Standard
All units in ug/L

APPENDIX B

BRINKERHOFF ENVIRONMENTAL SERVICES: FIGURES WITH RESULTS



LEGEND

-  MONITORING WELL LOCATION
-  GROUND WATER FLOW DIRECTION
- CONTOUR INTERVAL = 1.0 FEET
- 89.00- GROUND WATER LEVEL CONTOUR

BRINKERHOFF

A DIVISION OF CONSOLIDATED RESOURCE MANAGEMENT, INC.

FIGURE 3- SITE MAP
WALNFORD PARK
WALNS MILL (HILL) ROAD
ALLENTOWN (UPPER FREEHOLD), NEW JERSEY

DATE:

6/10/99

JOB NO.:

96106D

SCALE:

1" = 40'

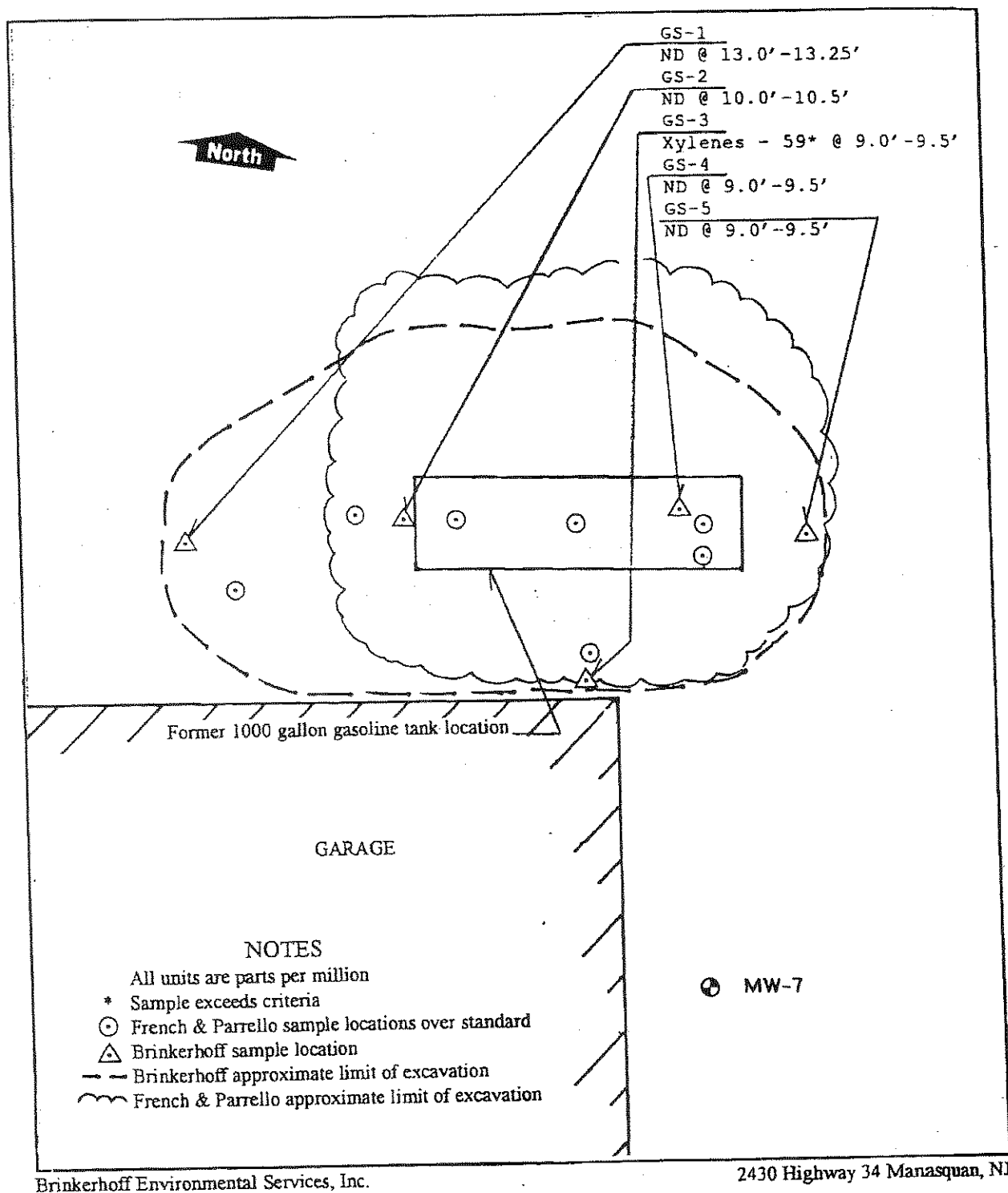
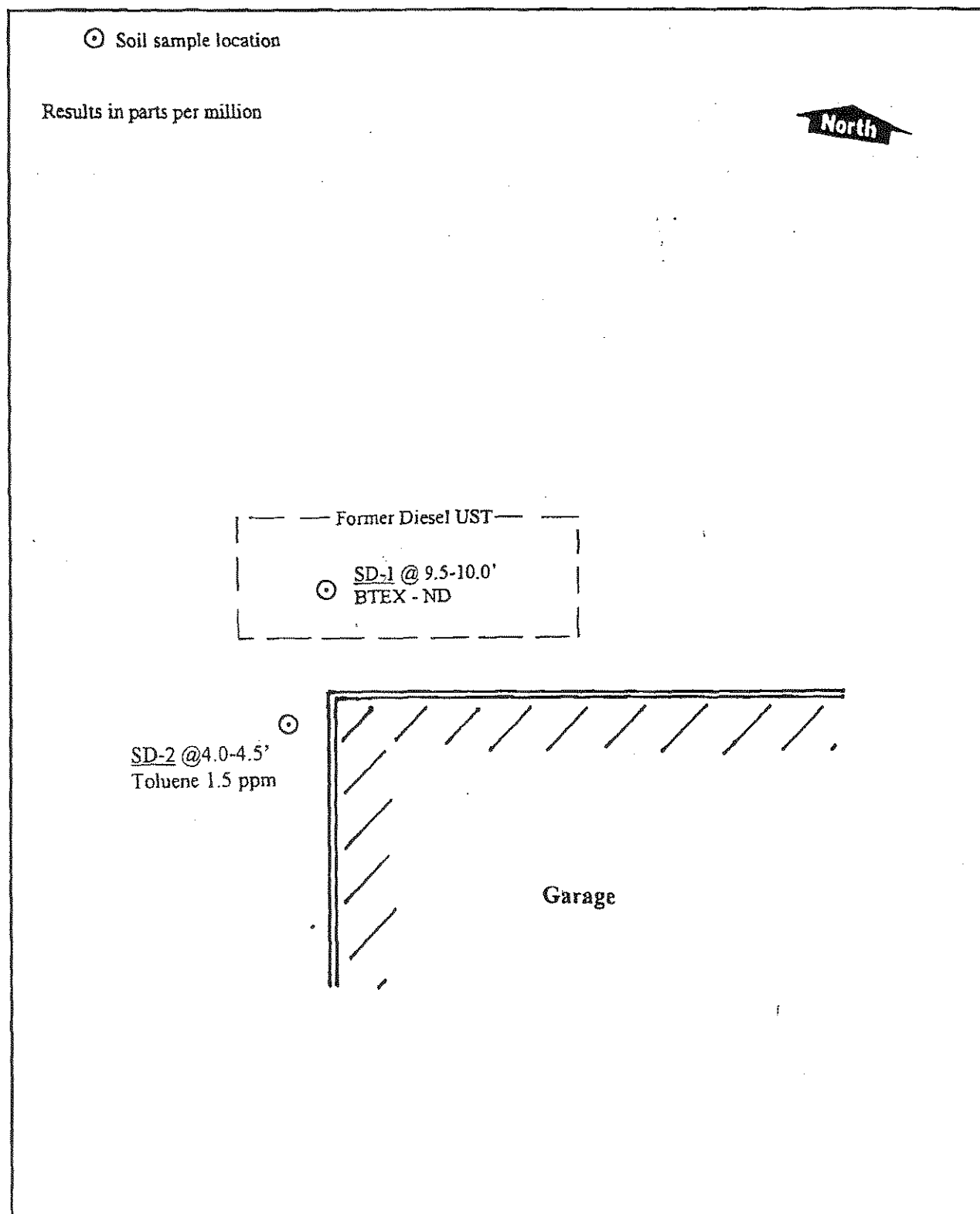


FIGURE 4-

SOIL SAMPLE LOCATIONS
Walnford Park
 Walns Mill (Hill) Road
 Allentown (Upper Freehold), New Jersey
 Scale: 1" = 5'



Brinkerhoff Environmental Services, Inc.

2430 Highway 34 Manasquan, NJ

FIGURE 2

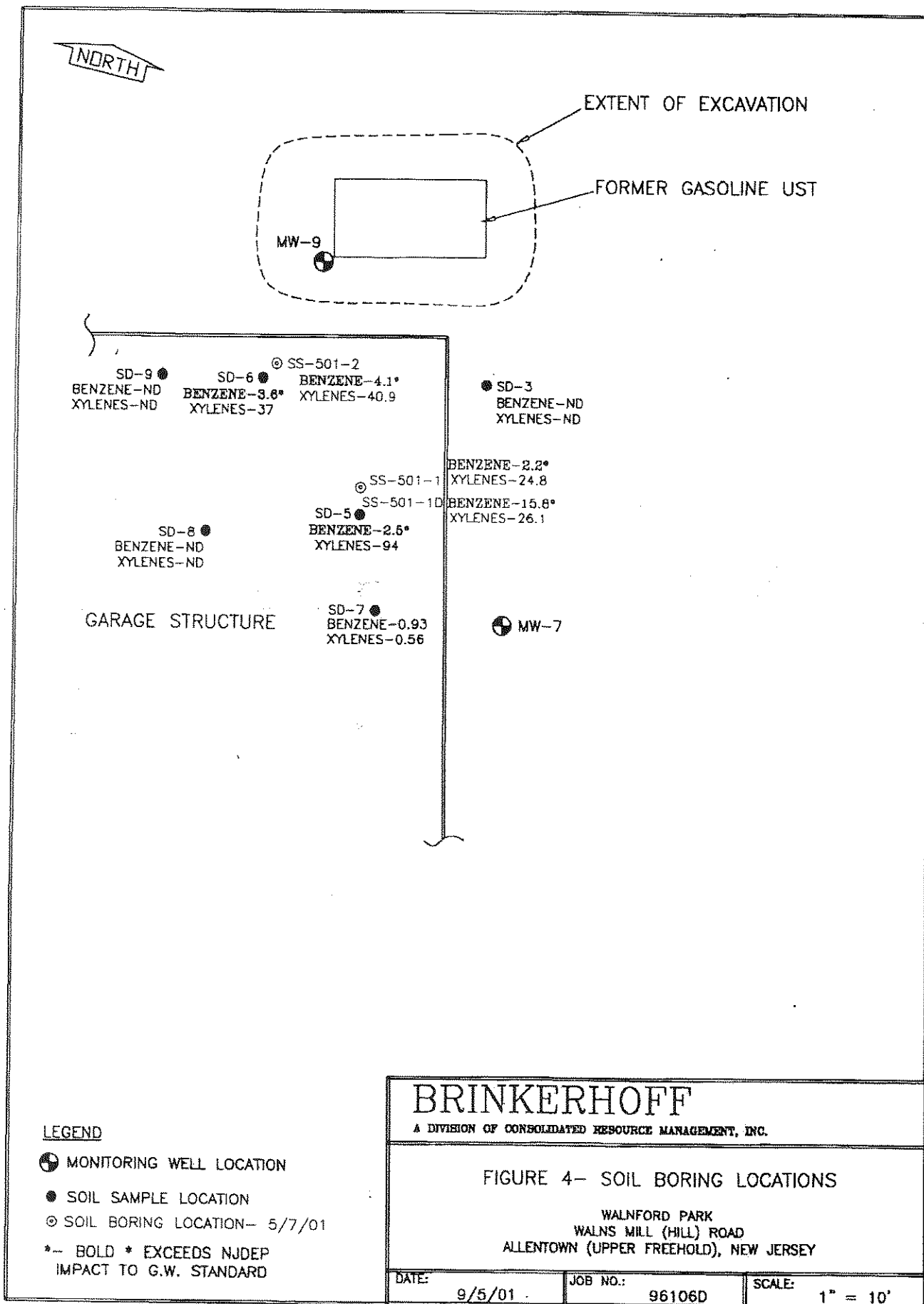
SOIL SAMPLE LOCATIONS

Walnford Park

Walns Mill (Hill) Road

Allentown (Upper Freehold), New Jersey

Scale: 1" = 5'



DATE: 9/5/01

JOB NO.: 96106D

SCALE: 1" = 10'



Najarian
Associates

Engineers • Planners • Scientists • Surveyors

December 9, 2014

Mr. James Mowczan, Senior Civil Engineer
Monmouth County Park System
805 Newman Springs Road
Lincroft, NJ 07738

**Re: Remedial Investigation Summary Letter Report
Walnford Park Maintenance Facility
91 Walnford Road, Allentown
Monmouth County, NJ 08501
NJDEP PI #: 022463
NJDEP Case #: 93-12-17-1205-53
Our Ref. Job #: 6577**

Dear Mr. Mowczan:

T.O. Najarian Associates, Inc. (Najarian) completed remedial investigation activities to evaluate contamination at the Walnford Park Maintenance Facility located at 91 Walnford Road, Allentown, Upper Freehold Township, New Jersey (hereafter "Site" or "Property"). The site impacts are the result of leaking diesel and gasoline underground storage tanks (USTs) that were removed from the Property in December 1993. The previous remedial activities completed by Najarian in September 2012 involved the collection and analyses of groundwater samples from six (6) existing monitoring wells. A Remedial Investigation (RI) Letter Report, which summarized the historic environmental activities completed on the Site by others, documented the remedial investigation activities completed by Najarian, and provided recommendations to bring the case to closure, was submitted to you in January 2013. Najarian completed additional RI work between August and October 2014, which included a New Jersey Department of Environmental Protection (NJDEP) file review in Trenton and a soil and groundwater investigation. The activities and results of the 2014 RI are presented in this letter report. A Site Location Map and Aerial Photograph Map are included as Figures 1 and 2.

Site Background

As presented in Najarian's January 2013 Letter Report, following the UST removals in 1993, petroleum impacted soils were identified in the area of each tank. Reportedly, visibly contaminated soil was excavated and disposed, and post-excavation soil samples were collected for laboratory analyses. Groundwater monitoring wells were installed on the Property and additional soil samples were collected and analyzed in an attempt to delineate the soil impacts. Elevated levels of BTEX (benzene, toluene, ethylbenzene, and total xylenes) compounds were identified in the soils in the area of the former tank locations and beneath the maintenance shed, particularly benzene from the former

gasoline tank. When comparing the historic soil sampling data to current NJDEP Standards, several samples representing the soil that remains in the ground reported benzene concentrations in excess of the NJDEP Default Impact to Groundwater Soil Screening Levels (DIGWSSLs) and the Residential Direct Contact Soil Remediation Standard (RDCSRS), while one sample collected beneath the maintenance shed reported benzene at a concentration that also exceeded the NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS). Contamination was identified in NJDEP-permitted groundwater monitoring wells located in the area of the former USTs in earlier sampling rounds completed by other consultants. BTEX compounds were elevated and, in several rounds, compounds were reported at levels exceeding applicable NJDEP Groundwater Quality Standards (GWQS). No elevated contaminant concentrations were reported as part of Najarian's September 2012 sampling round of monitoring wells MW-2 through MW-7 and MW-9. Monitoring well MW-8 was not located in the field during the September 2012 sampling event and therefore was not sampled at that time.

Remedial Activities 2014

Najarian completed a file review at the NJDEP offices in September 2014 and additional Remedial Investigation (RI) activities at the Site in October 2014 to evaluate the current soil and groundwater conditions. All remedial investigation activities were conducted in accordance with N.J.A.C. 7:26E Technical Requirements for Site Remediation, dated May 7, 2012, and the NJDEP Field Sampling and Procedures Manual, last revised April 2010.

NJDEP File Review

On August 19, 2014, Najarian submitted an NJDEP Open Public Records Act (OPRA) request for the Site. Files regarding the Site were reviewed by Najarian at the NJDEP offices in Trenton on September 25, 2014. No additional information was revealed during the file review.

Remedial Investigation

A total of nine (9) soil borings (SB-1 through SB-9) were advanced in the areas of the former UST systems on October 20, 2014. Boreholes SB-1, SB-3, SB-7, and SB-8 were converted to temporary well points to facilitate the collection of groundwater samples. A total of fifteen (15) soil samples and four (4) groundwater samples were collected as part of the investigation. The soil and groundwater samples, along with associated field/trip blanks, were analyzed at Integrated Analytical Laboratories (IAL), an NJDEP-certified laboratory, certification # 14571. A Sample Location Map is included as Figure 3.

Soil:

Several soil borings were placed at locations where previous soil samples reported elevated contaminant concentrations, including beneath the maintenance shed. Soil borings SB-1 through SB-4 were advanced through the concrete floor inside the

maintenance shed; SB-5 was installed at the former gasoline UST location; SB-6 was installed upgradient of SB-5; SB-7 was located side-gradient to the east; SB-8 was located down-gradient to the south; and SB-9 was located in the former diesel UST location. The soil borings were installed via Geoprobe™ Direct Push methodology. A concrete coring drill was utilized to access the soil beneath the concrete floor of the maintenance shed. Each soil boring was logged and field screened every six inches (6") by a Najarian Geologist using a Photoionization Detector (PID). The borings were advanced up to sixteen (16) feet below grade (ftbg). Brown silty sand (possibly fill material from previous UST excavation) was noted from grade to approximately 6 ftbg, beneath which a brown-green silty clay layer was observed to approximately 10 ftbg. A dark grey/brown silty clay micaceous layer was observed to the terminus of all borings. Groundwater was noted between 8 and 11 ftbg in the boreholes.

Petroleum odors and high PID readings (>500 ppm) were noted in three (3) of the nine (9) soil borings (SB-1, SB-2, and SB-5) at 7.0-8.0 ftbg. Fifteen (15) soil samples were collected at varying depths within the borings biased to the six-inch (6") increment exhibiting the highest PID readings; two samples were collected at different depths in several of the borings. Fourteen (14) soil samples, along with a field blank, were analyzed for TCL VO+TICS and TBA, and one (1) soil sample (SB-9 collected at 11.5-12.0) in the former diesel tank area was analyzed for Extractable Petroleum Hydrocarbons – Diesel Range Organics (EPH-DRO) Category 1. The analytical results for the contaminants-of-concern are tabulated below:

Table 1: Soil Analytical Data – October 2014 (ppm)								
Boring ID	Depth	PID reading (ppm)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TBA	EPH-DRO
SB-1	7.5-8.0	1,538	ND	0.694	79.4	177	ND	~
SB-1	10.5-11.0	142	ND	0.128	19.7	61.3	ND	~
SB-2	7.5-8.0	1,564	0.660	0.389	91.7	154	ND	~
SB-2	13.5-14.0	4.2	0.345	0.577	1.08	8.41	ND	~
SB-3	7.5-8.0	3.5	0.000489	ND	0.0036	0.00808	0.0032	~
SB-4	7.5-8.0	0.0	ND	ND	ND	ND	0.00525	~
SB-5	7.0-7.5	1,357	ND	0.125	3.99	27.9	ND	~
SB-5	15.5-16.0	0.0	0.091	0.204	4.18	2.05	ND	~
SB-6	7.5-8.0	6.1	0.032	ND	ND	ND	ND	~
SB-6	9.5-10.0	0.0	ND	ND	ND	ND	0.024	~
SB-7	7.5-8.0	0.0	ND	ND	ND	ND	0.014	~
SB-8	14.0-14.5	9.0	ND	ND	ND	ND	0.00306	~
SB-8	15.5-16.0	3.8	ND	ND	ND	ND	0.00787	~
SB-9	7.5-8.0	34.8	ND	ND	ND	ND	ND	~
SB-9	11.5-12.0	4.0	~	~	~	~	~	36.9
RDCSRS			2	6,300	7,800	12,000	1,400	5,100
NRDCSRS			5	91,000	110,000	170,000	11,000	54,000
DIGWSSL			0.005	7	13	19	0.3	NA

- RDCSRS: Residential Direct Contact Soil Remediation Standard, last amended 5/2012
- NRDCSRS: Non-Residential Direct Contact Soil Remediation Standard, last amended 5/2012
- DIGWSSL: Default Impact to Groundwater Soil Screening Level, last amended 11/2013
- TBA: Tertiary Butyl Alcohol
- EPH-DRO: Extractable Petroleum Hydrocarbons-Diesel Range Organics, Category 1
- Bold values represent exceedances of the NJDEP DIGWSSL
- Depth (ftbg): depth feet below grade
- ND: Not Detected
- ~: Not Analyzed
- (ppm): parts per million

The laboratory analyses revealed benzene, ethylbenzene and total xylenes in seven (7) soil samples exceeding the NJDEP Default Impact to Groundwater Screening Level (DIGWSSL) of 0.005 parts per million (ppm), 13 ppm, and 19 ppm, respectively. The volatile organic impacts were reported at depths between 7.0 and 16.0 feet below grade (ftbg), with the highest concentrations found between 7 and 11 ftbg. No contaminants were reported at concentrations exceeding applicable NJDEP Non-Residential or Residential Direct Contact Soil Remediation Standards. EPH-DRO was not reported at an elevated level in the soil sample collected near the former diesel underground storage tank (UST) system. The full analytical data table for soil is included in this letter report.

Groundwater:

Groundwater samples were collected from soil boring locations SB-1, SB-3, SB-7, and SB-8, which were converted to temporary sampling points labeled TWP-1, TWP-3, TWP-7 and TWP-8. The four (4) temporary well points were installed to depths up to sixteen (16) ftbg and were constructed of one-inch (1") diameter PVC casing with 0.010 slotted PVC well screens. The temporary well points were developed using a peristaltic pump until the discharge water was less turbid. Petroleum odors were observed in TWP-1. Following development, a groundwater sample was collected from each well point using a disposable bailer. The groundwater samples, along with trip and field blanks, were placed in laboratory supplied bottleware, properly preserved, labeled, secured in a cooler, and were shipped under chain-of-custody to IAL. The groundwater samples were analyzed for TCL VOC+TICs and TBA. The analytical results for the contaminants-of-concern are tabulated below:

Table 2: Groundwater Analytical Data – October 2014 (ppb)						
Sample #	Depth to Water (ftbg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	TBA
TWP-1	11.35	90.2	9.15	360	711	2.69
TWP-3	8.9	7.0	ND	ND	ND	3.45
TWP-7	9.3	ND	ND	ND	ND	ND
TWP-8	12.21	ND	ND	2.91	32.6	1.73
GWQS		1	600	700	1,000	100

- TBA: Tertiary Butyl Alcohol
- ftbg: feet below grade
- GWQS: NJDEP Groundwater Quality Standards, date last amended July 22, 2010 and readopted without change March 4, 2014
- Bold values in shaded cells represent exceedances of the GWQS
- ND: Not Detected
- (ppb): parts per billion

The laboratory analyses revealed benzene levels in temporary well point samples TWP-1 and TWP-3 at 90.2 ppb and 7.0 ppb, respectively, exceeding the NJDEP Groundwater Quality Standard (GWQS) of 1 part per billion (ppb). TWP-1 and TWP-3 were located within the maintenance shed, down-gradient of the former gasoline UST. No other gasoline constituent was identified in the groundwater exceeding the NJDEP GWQS. The full analytical data table for groundwater is included in this letter report.

As part of the RI activities, the soil borings and temporary well point locations, as well as the existing monitoring well locations and top of casing (TOC) elevations, were surveyed by Najarian. Groundwater elevations were calculated using the September 2012 depth to water measurements of the monitoring wells. The groundwater flow direction was calculated toward the northeast, confirming the direction determined by previous consultants. Monitoring well MW-8 was not located in 2012 and therefore was not included in the groundwater flow direction calculation. Subsequently, Monmouth County Parks personnel were able to locate MW-8; however, the steel well cap was unable to be removed during the October 2014 RI activities.

Conclusions

The Walnford Park Maintenance Facility, located at 91 Walnford Road in Allentown Township, New Jersey, consists of a historic residence, a maintenance garage, and maintenance shed with concrete flooring. Najarian completed a Remedial Investigation (RI) to further evaluate the current soil and groundwater conditions at the Site. The RI field work conducted on October 20, 2014 was primarily focused in areas downgradient of the former gasoline UST, particularly in the northeast portion of the maintenance shed, and one boring was placed within the area of the former diesel UST. The investigation included the collection and analyses of soil and groundwater samples.

Najarian's RI revealed soil contamination above the Default Impact to Groundwater Soil Screening Levels in four (4) soil borings in the former gasoline UST area. Samples collected from borings SB-1, SB-2, SB-5, and SB-6 at depths between 7 and 16 ftbg reported benzene, ethylbenzene, and/or total xylenes at elevated concentrations; the highest contaminant levels were found between 7 and 11 ftbg. The samples from borings SB-1 and SB-2 were collected beneath the concrete floor of the maintenance shed and boring SB-5 was located nearby at the exterior corner of the building; the presence of the building prevented the removal of this soil during the previous soil excavation activities to address the leaking gasoline tank. Boring SB-6 was located on the upgradient side of the previous gasoline tank excavation and represents residual contamination along the former excavation sidewall. Soil boring SB-9 was located in the former diesel UST and the soil samples from this boring did not reveal EPH-DRO or gasoline contamination concentrations above NJDEP Standards.

Based on the RI results, it appears the soil contamination requiring remediation is confined within an approximate 20' x 20' area between 7 and 16 ftbg. The contamination is situated beneath the northeastern corner of the maintenance shed. An

additional area of contamination is situated along the upgradient side of the former excavation, but at levels significantly less than the down-gradient mass of contaminants.

The groundwater samples collected from the four (4) temporary well points reported benzene in excess of the NJDEP Groundwater Quality Standards (GWQS) in TWP-1 and TWP-3. These points were located in the maintenance shed, down-gradient of the former gasoline UST. No other gasoline constituents were identified in excess of the NJDEP GWQS in the temporary well points. The groundwater sample from TWP-1, situated about 10-feet downgradient of the former gasoline UST excavation within the area of soil contamination, reported the highest contaminant concentration (benzene at 90.2 ppb), while the sample collected from the point further downgradient, TWP-3, demonstrated a significant decrease in the benzene level (benzene at 7.0 ppb). However, the downgradient edge of the contaminant plume remains undefined.

Additional RI work is necessary at the Site to determine the downgradient edge of the groundwater contaminant plume. MW-8 is located in a downgradient direction; however, this well was only recently re-located and the metal cap is currently stuck on the well due to corrosion. The ability to access the well needs to be assessed. A groundwater sample from this well, as well as groundwater samples from several temporary well points situated between former well point TWP-3 and the MW-8, need to be collected and analyzed to define the extent of the plume. Several of the points will be located within the southern portion of the existing maintenance shed.

Remediation is required to address the contaminated soil downgradient of the former UST excavation, which is a contributing source to the groundwater contamination. The soil can be excavated and properly disposed offsite or addressed using an alternative remedial technique, such as In-Situ Chemical Oxidation (ISCO). Soil excavation will require the demolition of the existing maintenance shed and the decommissioning of MW-7 and MW-9. Following source material remediation, post-excavation soil samples will be collected and analyzed to confirm the absence of contamination. One or more groundwater monitoring wells installed within the remediated area will be used to evaluate groundwater conditions.

A scope of work and associated costs to complete the additional groundwater delineation will be sent to you under a separate cover.



If you have any questions, please give me a call.

Very truly yours,
T.O. NAJARIAN ASSOCIATES, INC.

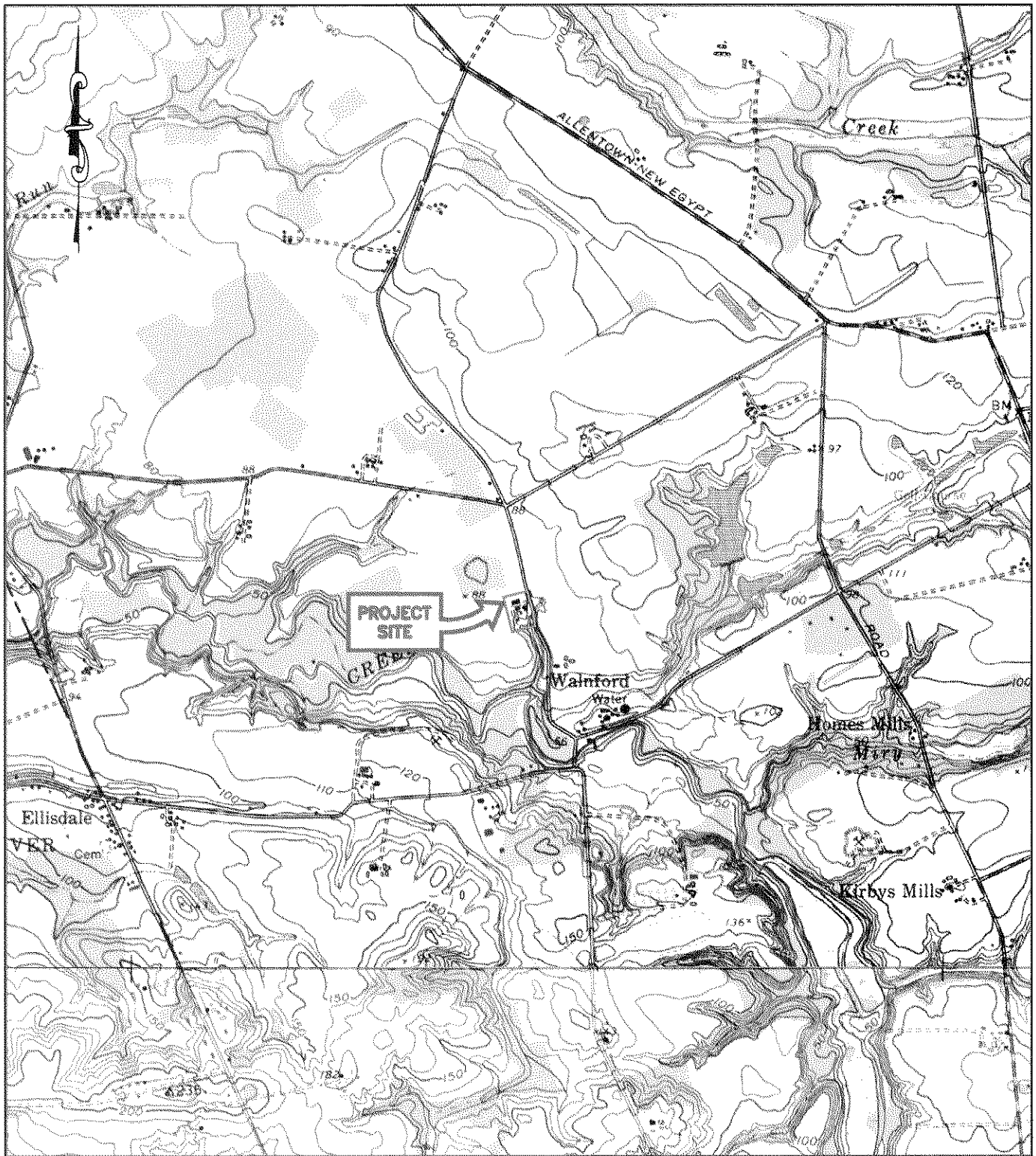
Robert Schwarzkopf, CHMM, LSRP
Senior Environmental Scientist / Project Manager

Enclosures: Figures 1 – 3, Soil & Groundwater Analytical Data Tables

cc: Dana M. Kitchell, Environmental Geologist
Vajira Gunawardana, P.E., PP, CFM, F. ASCE

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LEGEND:

SOURCE: U.S.G.S. ALLENTOWN & NEW EGYPT

1"=2000'
2000 0 2000 4000
scale feet

SITE LOCATION MAP

WALNORD MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALNORD ROAD
ALLENTOWN TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY



Najarian
Associates

Engineers • Planners • Scientists • Surveyors
One Industrial Way West, Eatontown, New Jersey 07724

DRAWN BY	SCALE	DATE	DWG. NO.	FIGURE
W.S.	1"=2000'	1-22-13	6577	1



LEGEND:

1"=100'

100 0 100 200

scale feet

AERIAL PHOTO

WALNFORD MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALNFORD ROAD
ALLENTOWN TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY

N *Najarian*
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DRAWN BY	SCALE	DATE	DWG. NO.	FIGURE
W.S.	1"=100'	1-22-13	6577	2

Sample #: Field ID: Lab ID: Date Sampled: Depth(ft):	NJDEP SOIL REMEDIATION STANDARDS				SB-1 (7.5-8)				SB-1 (10.5-11)				SB-2 (7.5-8)				SB-2 (13.5-14)				SB-3 (7.5-8)				SB-4 (7.5-8)				SB-5 (7.7-5)				SB-5 (15.5-16)			
	CAS	STANDARDS			10188-004				10188-010				10188-005				10188-011				10188-006				10188-007				10188-001				10188-002			
		Residential SRS	Non-Res SRS	Default IGW Screening Level	10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014			
		(mg/Kg)	(mg/Kg)	(mg/Kg)	7.5/8				10.5/11				7.5/8				13.5/14				7.5/8				7.5/8				7.5/8				15.5/16			
Volatiles (mg/Kg)				Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	
Dichlorodifluoromethane	75-71-8	490	230000	39	ND	1.25	0.898	ND	0.227	0.164	ND	0.796	0.573	ND	0.151	0.109	ND	0.00129	0.000734	ND	0.0012	0.000683	ND	0.246	0.177	ND	0.171	0.123								
Chloromethane	74-87-3	4	12	NS	ND	1.25	0.796	ND	0.227	0.145	ND	0.796	0.508	ND	0.151	0.097	ND	0.00129	0.000453	ND	0.0012	0.000421	ND	0.246	0.157	ND	0.171	0.109								
Vinyl chloride	75-01-4	0.7	2	0.005	ND	1.25	0.611	ND	0.227	0.111	ND	0.796	0.390	ND	0.151	0.074	ND	0.00129	0.000458	ND	0.0012	0.000426	ND	0.246	0.121	ND	0.171	0.084								
Bromomethane	74-83-9	25	59	0.04	ND	1.25	0.751	ND	0.227	0.137	ND	0.796	0.479	ND	0.151	0.091	ND	0.00129	0.000569	ND	0.0012	0.000529	ND	0.246	0.148	ND	0.171	0.103								
Chloroethane	75-00-3	220	1100	NS	ND	1.25	0.795	ND	0.227	0.145	ND	0.796	0.507	ND	0.151	0.096	ND	0.00129	0.000515	ND	0.0012	0.000479	ND	0.246	0.157	ND	0.171	0.109								
Trichlorofluoromethane	75-69-4	23000	340000	34	ND	1.25	0.911	ND	0.227	0.166	ND	0.796	0.581	ND	0.151	0.110	ND	0.00129	0.000731	ND	0.0012	0.00068	ND	0.246	0.180	ND	0.171	0.125								
1,1-Dichloroethene	75-35-4	11	150	0.008	ND	1.25	0.709	ND	0.227	0.129	ND	0.796	0.452	ND	0.151	0.086	ND	0.00129	0.000724	ND	0.0012	0.000673	ND	0.246	0.140	ND	0.171	0.097								
Acetone	67-64-1	70000	NS	19	ND	2.50	1.07	ND	0.455	0.194	ND	1.59	0.680	ND	0.303	0.129	0.027	0.00645	0.0011	ND	0.006	0.00102	ND	0.492	0.210	ND	0.342	0.146								
Carbon disulfide	75-15-0	7800	110000	6	ND	1.25	0.831	ND	0.227	0.151	ND	0.796	0.530	ND	0.151	0.101	ND	0.00129	0.000673	ND	0.0012	0.000626	ND	0.246	0.164	ND	0.171	0.114								
Methylene chloride	75-09-2	34	97	0.01	ND	2.50	2.48	ND	0.455	0.453	ND	1.59	1.58	ND	0.303	0.301	ND	0.00258	0.00255	ND	0.0024	0.00238	ND	0.492	0.489	ND	0.342	0.340								
tert-Butyl alcohol (TBA)	75-65-0	1400	11000	0.3	ND	2.50	1.95	ND	0.455	0.355	ND	1.59	1.24	ND	0.303	0.236	0.0032	0.00258	0.00195	0.00525	0.0024	0.00182	ND	0.492	0.363	ND	0.342	0.266								
trans-1,2-Dichloroethene	156-60-5	300	720	0.6	ND	1.25	0.599	ND	0.227	0.109	ND	0.796	0.382	ND	0.151	0.073	ND	0.00129	0.000556	ND	0.0012	0.000517	ND	0.246	0.118	ND	0.171	0.082								
Methyl tert-butyl ether (MTBE)	1634-04-4	110	320	0.2	ND	1.25	0.593	ND	0.227	0.108	ND	0.796	0.378	ND	0.151	0.072	ND	0.00129	0.000473	ND	0.0012	0.00044	ND	0.246	0.117	ND	0.171	0.081								
1,1-Dichloroethane	75-34-3	8	24	0.2	ND	1.25	0.570	ND	0.227	0.104	ND	0.796	0.364	ND	0.151	0.069	ND	0.00129	0.000459	ND	0.0012	0.000427	ND	0.246	0.112	ND	0.171	0.078								
cis-1,2-Dichloroethene	156-59-2	230	560	0.3	ND	1.25	0.558	ND	0.227	0.102	ND	0.796	0.356	ND	0.151	0.068	ND	0.00129	0.000323	ND	0.0012	0.0003	ND	0.246	0.110	ND	0.171	0.076								
2-Butanone (MEK)	78-93-3	3100	44000	0.9	ND	1.25	0.780	ND	0.227	0.142	ND	0.796	0.498	ND	0.151	0.095	0.00177	0.00129	0.000806	ND	0.0012	0.00075	ND	0.246	0.154	ND	0.171	0.107								
Bromochloromethane	74-97-5	NS	NS	NS	ND	1.25	0.741	ND	0.227	0.135	ND	0.796	0.473	ND	0.151	0.090	ND	0.00129	0.000454	ND	0.0012	0.000422	ND	0.246	0.146	ND	0.171	0.102								
Chloroform	67-66-3	0.6	2	0.4	ND	1.25	0.918	ND	0.227	0.167	ND	0.796	0.586	ND	0.151	0.111	ND	0.00129	0.000431	ND	0.0012	0.000401	ND	0.246	0.181	ND	0.171	0.126								
1,1,1-Trichloroethane	71-55-6	290	4200	0.3	ND	1.25	0.659	ND	0.227	0.120	ND	0.796	0.420	ND	0.151	0.080	ND	0.00129	0.000355	ND	0.0012	0.00033	ND	0.246	0.130	ND	0.171	0.090								
Carbon tetrachloride	56-23-5	0.6	2	0.005	ND	1.25	0.931	ND	0.227	0.170	ND	0.796	0.594	ND	0.151	0.113	ND	0.00129	0.000581	ND	0.0012	0.00054	ND	0.246	0.183	ND	0.171	0.128								
1,2-Dichloroethane (EDC)	107-06-2	0.9	3	0.005	ND	1.25	0.890	ND	0.227	0.089	ND	0.796	0.313	ND	0.151	0.060	ND	0.00129	0.000368	ND	0.0012	0.000342	ND	0.246	0.097	ND	0.171	0.067								
Benzene	71-43-2	2	5	0.005	ND	1.25	0.572	0.128	DJ	0.227	0.104	0.660	DJ	0.796	0.365	0.345	0.151	0.069	0.000489	J	0.00129	0.00029	ND	0.0012	0.00027	ND	0.246	0.113	0.091	J	0.171	0.078				
Trichloroethene	79-01-6	7	20	0.01	ND	1.25	0.569	ND	0.227	0.104	ND	0.796	0.363	ND	0.151	0.069	ND	0.00129	0.000344	ND	0.0012	0.00032	ND	0.246	0.112	ND	0.171	0.078								
1,2-Dichloropropane	78-87-5	2	5	0.005	ND	1.25	0.613	ND	0.227	0.112	ND	0.796	0.391	ND	0.151	0.074	ND	0.00129	0.000419	ND	0.0012	0.00039	ND	0.246	0.121	ND	0.171	0.084								
1,4-Dioxane	123-91-1	NS	NS	NS	ND	250	72.3	ND	45.6	13.2	ND	159	46.1	ND	30.3	8.76	ND	0.258	0.029	ND	0.240	0.027	ND	49.2	14.2	ND	34.2	9.90								
Bromodichloromethane	75-27-4	1	3	0.005	ND	1.25	0.615	ND	0.227	0.112	ND	0.796	0.393	ND	0.151	0.075	ND	0.00129	0.000365	ND	0.0012	0.00034	ND	0.246	0.121	ND	0.171	0.084								
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND	1.25	0.580	ND	0.227	0.106	ND	0.796	0.370	ND	0.151	0.070	ND	0.00129	0.000321	ND	0.0012	0.000289	ND	0.246	0.114	ND	0.171	0.079								
4-Methyl-2-pentanone (MIBK)	106-10-1	NS	NS	NS	ND	1.25	0.539	ND	0.227	0.098	ND	0.796	0.344	ND	0.151	0.065	ND	0.00129	0.000445	ND	0.0012	0.000414	ND	0.246	0.106	ND	0.171	0.074								
Toluene	108-88-3	6300	91000	7	0.694	DJ	1.25	0.361	0.162	DJ	0.227	0.066	0.389	DJ	0.796	0.230	0.577	0.151	0.044	ND	0.00129	0.000306	ND	0.0012	0.000284	ND	0.246	0.071	0.204	0.171	0.049					
trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	ND	1.25	0.578	ND	0.227	0.105	ND	0.796	0.369	ND	0.151	0.070	ND	0.00129	0.00048	ND	0.0012	0.000446	ND	0.246	0.114	ND	0.171	0.079								
1,1,2-Trichloroethane	79-00-5	2	6	0.02	ND	1.25	0.596	ND	0.227	0.109	ND	0.796	0.381	ND	0.151	0.072	ND	0.00129	0.000319	ND	0.0012	0.000296	ND	0.246	0.118	ND	0.171	0.082								
Tetrachloroethene	127-18-4	2	5	0.005	ND	1.25	0.621	ND	0.227	0.113	ND	0.796	0.396	ND	0.151	0.075	ND	0.00129	0.000375	ND	0.0012	0.000349	ND	0.246	0.122	ND	0.171	0.085								
2-Hexanone	591-78-6	NS	NS	NS	ND	1.25	0.578	ND	0.227	0.105	ND	0.796	0.369	ND	0.151	0.070																				

Sample #: Field ID: Lab ID: Date Sampled: Depth(ft):	CAS	NJDEP SOIL REMEDIATION STANDARDS			SB-6 (7.5-8)				SB-6 (9.5-10)				SB-7 (7.5-8)				SB-8 (14-14.5)				SB-8 (15.5-16)				SB-9 (7.5-8)				SB-9 (11.5-12)			
		Residential			Non-Res			Default IGW			10188-008			10188-009			10188-012			10188-013			10188-014			10188-015			10188-016			
		SRS	SRS	Screening	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014	10/20/2014				
		Level	7.5/6	9.5/10	7.5/8	14/14.5	15.5/16	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12	7.5/8	11.5/12			
		(mg/Kg)	(mg/Kg)	(mg/Kg)	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL
Volatiles (mg/Kg)																																
Dichlorodifluoromethane	75-71-8	490	230000	39	ND		0.00127	0.000723	ND		0.00119	0.000677	ND		0.001	0.000569	ND		0.00127	0.000723	ND		0.00119	0.000677	ND		0.00127	0.000677	ND		0.00119	0.000677
Chloromethane	74-87-3	4	12	NS	ND		0.00127	0.000446	0.00688	Z	0.00119	0.000418	0.00309		0.001	0.000351	0.00165		0.00127	0.000446	0.00232		0.00119	0.000418	ND		0.00127	0.000418	ND		0.00119	0.000418
Vinyl chloride	75-01-4	0.7	2	0.005	ND		0.00127	0.000451	ND		0.00119	0.000422	ND		0.001	0.000355	ND		0.00127	0.000451	ND		0.00119	0.000422	ND		0.00127	0.000451	ND		0.00119	0.000422
Bromomethane	74-83-9	25	58	0.04	ND		0.00127	0.00056	ND		0.00119	0.000525	ND		0.001	0.000441	ND		0.00127	0.00056	ND		0.00119	0.000525	ND		0.00127	0.00056	ND		0.00119	0.000525
Chloroethane	75-00-3	220	1100	NS	ND		0.00127	0.000507	ND		0.00119	0.000475	ND		0.001	0.000399	ND		0.00127	0.000507	ND		0.00119	0.000475	ND		0.00127	0.000507	ND		0.00119	0.000475
Trichlorofluoromethane	75-69-4	23000	340000	34	ND		0.00127	0.00072	ND		0.00119	0.000675	ND		0.001	0.000567	ND		0.00127	0.00072	ND		0.00119	0.000675	ND		0.00127	0.00072	ND		0.00119	0.000675
1,1-Dichloroethene	75-35-4	11	150	0.008	ND		0.00127	0.000712	ND		0.00119	0.000668	ND		0.001	0.000561	ND		0.00127	0.000712	ND		0.00119	0.000668	ND		0.00127	0.000712	ND		0.00119	0.000668
Acetone	67-64-1	70000	NS	19	ND		0.00635	0.00108	0.077	Z	0.00595	0.00102	0.046		0.005	0.000854	0.036		0.00635	0.00108	0.032		0.00595	0.00102	0.046		0.00635	0.00108	0.032		0.00595	0.00102
Carbon disulfide	75-15-0	7800	110000	6	0.00239		0.00127	0.000663	0.00454	Z	0.00119	0.000621	ND		0.001	0.000522	0.00242		0.00127	0.000663	0.00319		0.00119	0.000621	ND		0.00127	0.000663	0.00319		0.00119	0.000621
Methylene chloride	75-09-2	34	97	0.01	ND		0.00254	0.00261	ND		0.00238	0.00236	ND		0.002	0.00198	ND		0.00254	0.00261	ND		0.00238	0.00236	ND		0.00254	0.00261	ND		0.00238	0.00236
tert-Butyl alcohol (TBA)	75-65-0	1400	11000	0.3	ND		0.00254	0.00192	0.024	Z	0.00238	0.0018	0.014		0.002	0.00151	0.00306		0.00254	0.00192	0.00787		0.00238	0.0018	0.014		0.00254	0.00192	0.00787		0.00238	0.0018
trans-1,2-Dichloroethene	156-60-5	300	720	0.6	ND		0.00127	0.000547	ND		0.00119	0.000513	ND		0.001	0.000431	ND		0.00127	0.000547	ND		0.00119	0.000513	ND		0.00127	0.000547	ND		0.00119	0.000513
Methyl tert-butyl ether (MTBE)	1634-04-4	110	320	0.2	ND		0.00127	0.000466	0.00283	Z	0.00119	0.000437	ND		0.001	0.000367	0.003		0.00127	0.000466	0.020		0.00119	0.000437	ND		0.00127	0.000466	0.020		0.00119	0.000437
1,1-Dichloroethane	75-34-3	8	24	0.2	ND		0.00127	0.000452	ND		0.00119	0.000424	ND		0.001	0.000356	ND		0.00127	0.000452	ND		0.00119	0.000424	ND		0.00127	0.000452	ND		0.00119	0.000424
cis-1,2-Dichloroethene	156-59-2	230	560	0.3	ND		0.00127	0.000318	ND		0.00119	0.000298	ND		0.001	0.00025	ND		0.00127	0.000318	ND		0.00119	0.000298	ND		0.00127	0.000318	ND		0.00119	0.000298
2-Butanone (MEK)	78-93-3	3100	44000	0.9	ND		0.00127	0.000794	0.00592	Z	0.00119	0.000744	0.00183		0.001	0.000625	0.00403		0.00127	0.000794	0.00374		0.00119	0.000744	ND		0.00127	0.000794	0.00374		0.00119	0.000744
Bromochloromethane	74-97-5	NS	NS	NS	ND		0.00127	0.000447	ND		0.00119	0.000419	ND		0.001	0.000352	ND		0.00127	0.000447	ND		0.00119	0.000419	ND		0.00127	0.000447	ND		0.00119	0.000419
Chloroform	67-66-3	0.6	2	0.4	ND		0.00127	0.000424	ND		0.00119	0.000397	ND		0.001	0.000334	ND		0.00127	0.000424	ND		0.00119	0.000397	ND		0.00127	0.000424	ND		0.00119	0.000397
1,1,1-Trichloroethane	71-55-6	290	4200	0.3	ND		0.00127	0.000349	ND		0.00119	0.000327	ND		0.001	0.000275	ND		0.00127	0.000349	ND		0.00119	0.000327	ND		0.00127	0.000349	ND		0.00119	0.000327
Carbon tetrachloride	56-23-5	0.6	2	0.005	ND		0.00127	0.000572	ND		0.00119	0.000536	ND		0.001	0.00045	ND		0.00127	0.000572	ND		0.00119	0.000536	ND		0.00127	0.000572	ND		0.00119	0.000536
1,2-Dichloroethane (EDC)	107-06-2	0.9	3	0.005	ND		0.00127	0.000362	ND		0.00119	0.000339	ND		0.001	0.000285	ND		0.00127	0.000362	ND		0.00119	0.000339	ND		0.00127	0.000362	ND		0.00119	0.000339
Benzene	71-43-2	2	5	0.005	0.032		0.00127	0.000266	ND		0.00119	0.000268	ND		0.001	0.000225	ND		0.00127	0.000266	ND		0.00119	0.000268	ND		0.00127	0.000266	ND		0.00119	0.000268
Trichloroethene	79-01-6	7	20	0.01	ND		0.00127	0.000339	ND		0.00119	0.000318	ND		0.001	0.000267	ND		0.00127	0.000339	ND		0.00119	0.000318	ND		0.00127	0.000339	ND		0.00119	0.000318
1,2-Dichloropropane	78-87-5	2	5	0.005	ND		0.00127	0.000413	ND		0.00119	0.000387	ND		0.001	0.000325	ND		0.00127	0.000413	ND		0.00119	0.000387	ND		0.00127	0.000413	ND		0.00119	0.000387
1,4-Dioxane	123-91-1	NS	NS	NS	ND		0.254	0.029	ND		0.238	0.027	ND		0.200	0.023	ND		0.254	0.029	ND		0.238	0.027	ND		0.254	0.029	ND		0.238	0.027
Bromodichloromethane	75-27-4	1	3	0.005	ND		0.00127	0.000359	ND		0.00119	0.000337	ND		0.001	0.000283	ND		0.00127	0.000359	ND		0.00119	0.000337	ND		0.00127	0.000359	ND		0.00119	0.000337
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	ND		0.00127	0.000316	ND		0.00119	0.000296	ND		0.001	0.000249	ND		0.00127	0.000316	ND		0.00119	0.000296	ND		0.00127	0.000316	ND		0.00119	0.000296
4-Methyl-2-pentanone (MIBK)	108-10-1	NS	NS	NS	ND		0.00127	0.000438	ND		0.00119	0.000411	ND		0.001	0.000346	ND		0.00127	0.000438	ND		0.00119	0.000411	ND		0.00127	0.000438	ND		0.00119	0.000411
Toluene	108-88-3	6300	91000	7	ND		0.00127	0.000301	ND		0.00119	0.000282	ND		0.001	0.000237	ND		0.00127	0.000301	ND		0.00119	0.000282	ND		0.00127	0.000301	ND		0.00119	0.000282
trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	ND		0.00127	0.000472	ND		0.00119	0.000443	ND		0.001	0.000372	ND		0.00127	0.000472	ND		0.00119	0.000443	ND		0.00127	0.000472	ND		0.00119	0.000443
1,1,2-Trichloroethane	79-00-5	2	6	0.02	ND		0.00127	0.000314	ND		0.00119	0.000294	ND		0.001	0.000247	ND		0.00													

Sample #:		HIGHER OF	Table 1 - Mar 13	TWP-7				TWP-8				FIELD BLANK (AQ)				TWP-3				TWP-1				TRIP BLANK			
Field ID:		PQLs	Vapor Intrusion	10189-001				10189-002				10189-003				10189-004				10189-005				10189-006			
Lab ID:		and	GW	10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014				10/20/2014			
Date Sampled:		GWQC	Screening	9.3				12.21								8.9				11.35							
Depth(ft):		(ug/L)	Levels																								
	CAS		(ug/L)	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL
Volatiles (ug/L)																											
Dichlorodifluoromethane	75-71-8	1000	1000	ND		1.00	0.720	ND		1.00	0.720	ND		1.00	0.720	ND		1.00	0.720	ND		1.00	0.720	ND		1.00	0.720
Chloromethane	74-87-3	NS	240	ND		1.00	0.638	ND		1.00	0.638	ND		1.00	0.638	ND		1.00	0.638	ND		1.00	0.638	ND		1.00	0.638
Vinyl chloride	75-01-4	1	1	ND		1.00	0.490	ND		1.00	0.490	ND		1.00	0.490	ND		1.00	0.490	ND		1.00	0.490	ND		1.00	0.490
Bromomethane	74-83-9	10	20	ND		1.00	0.602	ND		1.00	0.602	ND		1.00	0.602	ND		1.00	0.602	ND		1.00	0.602	ND		1.00	0.602
Chloroethane	75-00-3	5	26000	ND		1.00	0.637	ND		1.00	0.637	ND		1.00	0.637	ND		1.00	0.637	ND		1.00	0.637	ND		1.00	0.637
Trichlorofluoromethane	75-69-4	2000	2000	ND		1.00	0.730	ND		1.00	0.730	ND		1.00	0.730	ND		1.00	0.730	ND		1.00	0.730	ND		1.00	0.730
1,1-Dichloroethene	75-35-4	1	260	ND		1.00	0.568	ND		1.00	0.568	ND		1.00	0.568	ND		1.00	0.568	ND		1.00	0.568	ND		1.00	0.568
Acetone	67-64-1	6000	21000000	ND		5.00	0.854	ND		5.00	0.854	ND		5.00	0.854	ND		5.00	0.854	13.8		5.00	0.854	ND		5.00	0.854
Carbon disulfide	75-15-0	700	1500	ND		1.00	0.666	ND		1.00	0.666	ND		1.00	0.666	ND		1.00	0.666	ND		1.00	0.666	ND		1.00	0.666
Methylene chloride	75-09-2	3	920	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99
tert-Butyl alcohol (TBA)	75-65-0	100	NS	ND		4.00	1.56	1.73	J	4.00	1.56	ND		4.00	1.56	3.45	J	4.00	1.56	2.69	J	4.00	1.56	ND		4.00	1.56
trans-1,2-Dichloroethene	156-60-5	100	520	ND		1.00	0.480	ND		1.00	0.480	ND		1.00	0.480	ND		1.00	0.480	ND		1.00	0.480	ND		1.00	0.480
Methyl tert-butyl ether (MTBE)	1634-04-4	70	580	ND		1.00	0.475	2.54		1.00	0.475	ND		1.00	0.475	11.7		1.00	0.475	2.75		1.00	0.475	ND		1.00	0.475
1,1-Dichloroethane	75-34-3	50	50	ND		1.00	0.457	ND		1.00	0.457	ND		1.00	0.457	ND		1.00	0.457	ND		1.00	0.457	ND		1.00	0.457
cis-1,2-Dichloroethene	156-59-2	70	NS	ND		1.00	0.447	ND		1.00	0.447	ND		1.00	0.447	ND		1.00	0.447	ND		1.00	0.447	ND		1.00	0.447
2-Butanone (MEK)	78-93-3	300	2500000	ND		1.00	0.625	ND		1.00	0.625	ND		1.00	0.625	ND		1.00	0.625	ND		1.00	0.625	ND		1.00	0.625
Bromochloromethane	74-97-5	NS	NS	ND		1.00	0.594	ND		1.00	0.594	ND		1.00	0.594	ND		1.00	0.594	ND		1.00	0.594	ND		1.00	0.594
Chloroform	67-66-3	70	70	ND		1.00	0.736	ND		1.00	0.736	ND		1.00	0.736	ND		1.00	0.736	ND		1.00	0.736	ND		1.00	0.736
1,1,1-Trichloroethane	71-55-6	30	13000	ND		1.00	0.528	ND		1.00	0.528	ND		1.00	0.528	ND		1.00	0.528	ND		1.00	0.528	ND		1.00	0.528
Carbon tetrachloride	56-23-5	1	1	ND		1.00	0.746	ND		1.00	0.746	ND		1.00	0.746	ND		1.00	0.746	ND		1.00	0.746	ND		1.00	0.746
1,2-Dichloroethane (EDC)	107-06-2	2	3	ND		1.00	0.393	ND		1.00	0.393	ND		1.00	0.393	ND		1.00	0.393	ND		1.00	0.393	ND		1.00	0.393
Benzene	71-43-2	1	20	ND		1.00	0.458	ND		1.00	0.458	ND		1.00	0.458	7.00		1.00	0.458	90.2		1.00	0.458	ND		1.00	0.458
Trichloroethene	79-01-6	1	2	ND		1.00	0.456	ND		1.00	0.456	ND		1.00	0.456	ND		1.00	0.456	ND		1.00	0.456	ND		1.00	0.456
1,2-Dichloropropane	78-87-5	1	4	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491
1,4-Dioxane	123-91-1	10	NS	ND		200	57.9	ND		200	57.9	ND		200	57.9	ND		200	57.9	ND		200	57.9	ND		200	57.9
Bromodichloromethane	75-27-4	1	2	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493
cis-1,3-Dichloropropene	10061-01-5	NS	7	ND		1.00	0.465	ND		1.00	0.465	ND		1.00	0.465	ND		1.00	0.465	ND		1.00	0.465	ND		1.00	0.465
4-Methyl-2-pentanone (MIBK)	108-10-1	NS	900000	ND		1.00	0.432	ND		1.00	0.432	ND		1.00	0.432	ND		1.00	0.432	ND		1.00	0.432	ND		1.00	0.432
Toluene	108-88-3	600	330000	ND		1.00	0.289	ND		1.00	0.289	ND		1.00	0.289	ND		1.00	0.289	9.15		1.00	0.289	ND		1.00	0.289
trans-1,3-Dichloropropene	10061-02-6	NS	7	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463
1,1,2-Trichloroethane	79-00-5	3	8	ND		1.00	0.478	ND		1.00	0.478	ND		1.00	0.478	ND		1.00	0.478	ND		1.00	0.478	ND		1.00	0.478
Tetrachloroethene	127-18-4	1	31	ND		1.00	0.498	ND		1.00	0.498	ND		1.00	0.498	ND		1.00	0.498	ND		1.00	0.498	ND		1.00	0.498
2-Hexanone	591-78-6	300	NS	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463
Dibromochloromethane	124-48-1	1	6	ND		1.00	0.409	ND		1.00	0.409	ND		1.00	0.409	ND		1.00	0.409	ND		1.00	0.409	ND		1.00	0.409
1,2-Dibromoethane (EDB)	106-93-4	0.03	0.4	ND		1.00	0.540	ND		1.00	0.540	ND		1.00	0.540	ND		1.00	0.540	ND		1.00	0.540	ND		1.00	0.540
Chlorobenzene	108-90-7	50	770	ND		1.00	0.546																				

MAINTENANCE
GARAGE

ENTRANCE

FARMLAND

GRAVEL DRIVEWAY

MW-6

MH

HISTORIC
RESIDENCE

WALNFORD ROAD

MW-2

SB-6

MW-9

SB-5

SB-7/TWP-7

SB-2

SB-1/TWP-1

MW-7

SB-8/TWP-8

SB-9

SB-3/TWP-3

SB-4

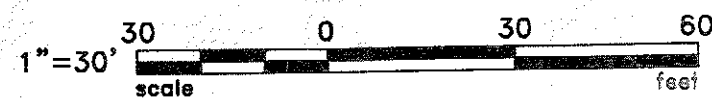
MAINTENANCE
SHED

MW-8

MW-5

NOTES

- PERMITTED NJDEP MONITORING WELL
- SOIL BORING/TEMPORARY WELL POINT



MW-4

DESIGNED		SAMPLE LOCATION MAP			
APPROVED		CHECKED		WALNFORD PARK MAINTENANCE FACILITY BLOCK 49 LOT 2 91 WALNFORD ROAD ALLENTOWN TOWNSHIP, MONMOUTH COUNTY, NJ	
HARRY J. WIDDIS		 Professional Engineers, Land Surveyors & Planners • Scientists One Industrial Way West, Eatontown, New Jersey 07724 (732) 389-0220 • Facsimile No. (732) 389-8546 Certificate of Authorization Certificate # 24GAZ7993300			
N.J. PROFESSIONAL LAND SURVEYOR No. 26384	DRAWN BY: DPF	SCALE: 1"=30'	DATE: 11-24-14	DRAWING NO: 6577	SHEET NO: FIG. 3

June 10, 2015

Mr. James Mowczan, Senior Civil Engineer
Monmouth County Park System
805 Newman Springs Road
Lincroft, NJ 07738

**Re: Remedial Investigation Summary Letter Report
Walnford Park Maintenance Facility
91 Walnford Road, Allentown
Monmouth County, NJ 08501
NJDEP PI #: 022463
NJDEP Case #: 93-12-17-1205-53
Our Ref. Job #: 6577**

Dear Mr. Mowczan:

T.O. Najarian Associates, Inc. (Najarian) completed additional Remedial Investigation (RI) activities to delineate the groundwater contamination at the Walnford Park Maintenance Facility at 91 Walnford Road, Allentown, New Jersey on April 29, 2015. All remedial investigation activities were conducted in accordance with N.J.A.C. 7:26E, *Technical Requirements for Site Remediation*, dated May 7, 2012, and the New Jersey Department of Environmental Protection (NJDEP) Field Sampling and Procedures Manual, last revised April 2010. A Site Location Map, Aerial Photograph Map, and a Sample Location Map are included as Figures 1, 2, and 3, respectively.

Site History

The site impacts are the result of leaking diesel and gasoline underground storage tanks (USTs) that were removed from the Property in December 1993. Previous remedial investigation activities were completed by Najarian in September 2012 through October 2014, which involved an NJDEP file review, soil delineation sampling, permitted monitoring well sampling and temporary well point sampling. The RI activities revealed that the soils contain contaminants at concentrations exceeding the NJDEP Default Impact to Groundwater Soil Screening Levels (DIGWSSLs) within an approximate 20' x 20' area between 7 and 16 feet below grade. The contamination is situated beneath the northeastern corner of the maintenance shed. As the contaminant levels do not exceed any applicable NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS) and the impacted material is located below the groundwater table, this soil does not need to be actively remediated; groundwater data will be used to determine when remediation is complete.

There are eight (8) NJDEP permitted wells onsite, MW-2 through MW-9. MW-1 was previously destroyed and replaced with MW-9. Monitoring wells, MW-2 through MW-7, and MW-9 were sampled in November 2012. MW-8 is located in a downgradient direction; however, this well was not located in the field and had not been sampled in the past. Subsequently, Monmouth County Park's personnel were able to locate MW-8; however, the steel well cap was unable to be removed during the October 2014 RI activities due to well corrosion. Najarian personnel located MW-8 and successfully opened the well cap during the April 2015 RI activities.

Remedial Activities April 2015

On April 29, 2015, Najarian conducted the additional RI work at the Site to delineate the groundwater contaminant plume. Najarian coordinated with AWT Environmental Services, Inc. of Sayreville, New Jersey to advance six (6) soil borings in downgradient areas, with four inside the maintenance shed. The soil borings (SB-10 through SB-15) were installed via Geoprobe™ Direct Push methodology to depths up to sixteen (16) feet below grade (ftbg). Each boring was field screened using a Photoionization Detector (PID) every six-inches (6") by a Najarian Geologist. The soils did not exhibit any petroleum vapors on the PID throughout the soil columns.

The soil borings were converted into six (6) temporary well points, TWP-10 through TWP-15. Groundwater samples were collected from the temporary well points, TWP-10 through TWP-15, as well as monitoring wells, MW-7, MW-8, and MW-9. The groundwater samples were analyzed for TCL VO+TICs and TBA at Integrated Analytical Laboratories (IAL), an NJDEP-certified laboratory, certification # 14571. A Sample Location Map is included as Figure 3.

The laboratory analyses did not reveal any gasoline constituents exceeding the NJDEP Groundwater Quality Standards (GWQS). Toluene and total xylenes were reported in groundwater sample, TWP-11, at 0.749 parts per billion (ppb) and 2.03 ppb, respectively, far below their respective GWQS of 600 ppb and 700 ppb. Methyl tertiary butyl ether (MTBE) was reported at 2.22 ppb in TWP-12, below its GWQS of 70 ppb. The analytical results are tabulated below and the full analytical data table is enclosed.

Table 1: Groundwater Analytical Data – April 2015 (ppb)							
Sample #	Depth to Water (ftbg)	Benzene	Toluene	Ethylbenzene	Total Xylenes	TBA	MTBE
MW-7	4.75	ND	ND	ND	ND	ND	ND
MW-8	4.04	ND	ND	ND	ND	ND	ND
MW-9	4.25	ND	ND	ND	ND	ND	ND
TWP-10	4.45	ND	ND	ND	ND	ND	ND
TWP-11	4.31	ND	0.749	ND	2.03	ND	ND
TWP-12	5.40	ND	ND	ND	ND	ND	2.22
TWP-13	6.81	ND	ND	ND	ND	ND	ND
TWP-14	4.27	ND	ND	ND	ND	ND	ND
TWP-15	5.12	ND	ND	ND	ND	ND	ND
GWQS		1	600	700	1,000	100	70

- TBA: Tertiary Butyl Alcohol
- ftbg: feet below grade
- GWQS: NJDEP Groundwater Quality Standards, date last amended July 22, 2010 and readopted without change March 4, 2014
- Bold values in shaded cells represent exceedances of the GWQS
- ND: Not Detected
- (ppb): parts per billion

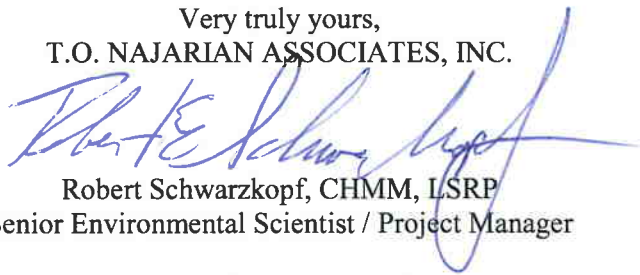
Conclusions

The recent groundwater investigation at the Walnford Park Maintenance Facility documented that the groundwater contamination is limited to the area beneath the maintenance shed, immediately downgradient of the former gasoline UST. The groundwater contaminant plume is fully delineated.

A detailed scope of work and associated costs to complete the remedial action(s) will be sent to you under a separate cover.

If you have any questions, please give me a call.

Very truly yours,
T.O. NAJARIAN ASSOCIATES, INC.



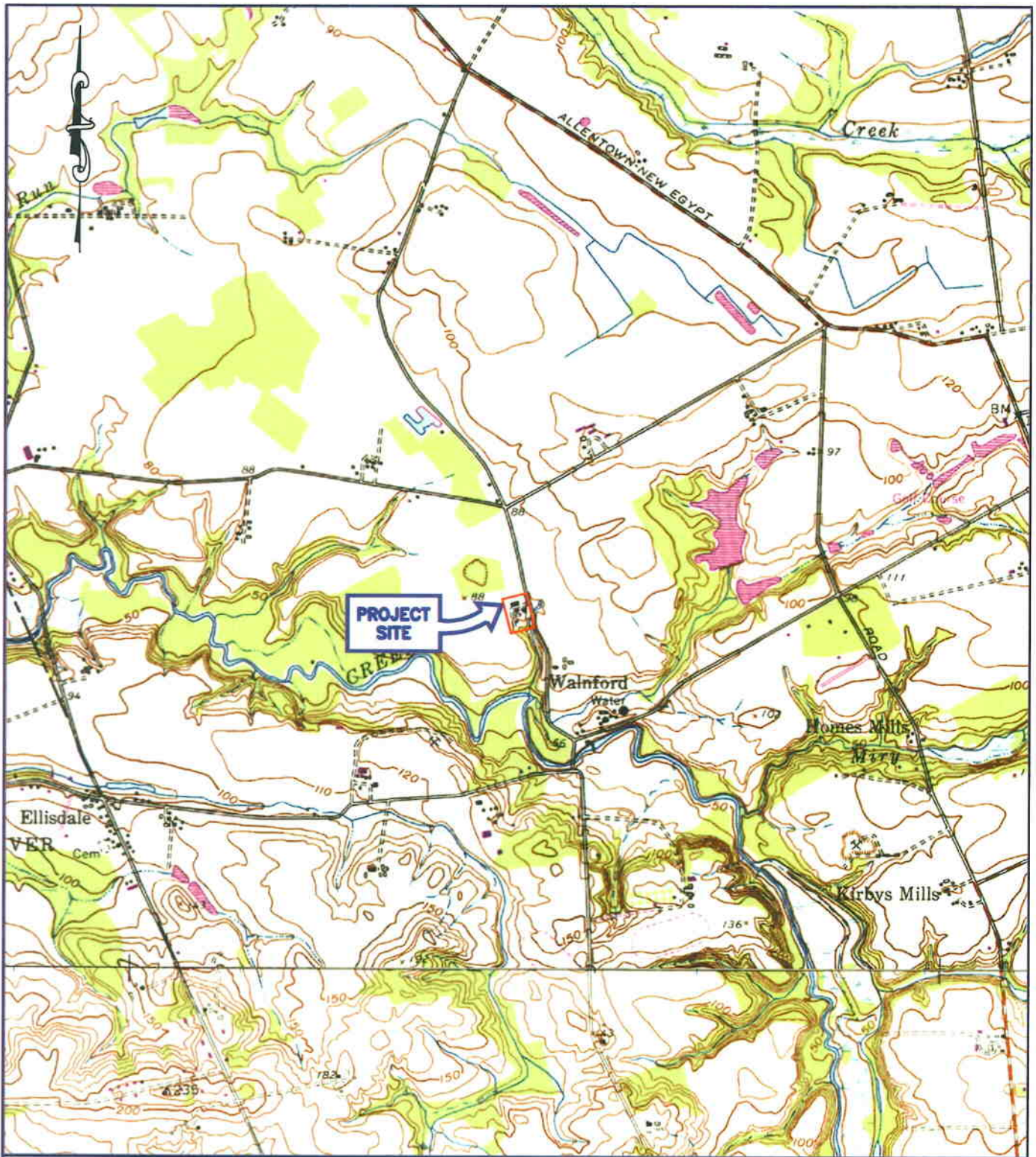
Robert Schwarzkopf, CHMM, LSRP
Senior Environmental Scientist / Project Manager

Enclosures: Figures 1 – 3, Groundwater Analytical Data Table

cc: Dana M. Kitchell, Environmental Geologist
Vajira Gunawardana, P.E., PP, CFM, F. ASCE

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LEGEND:

SOURCE: U.S.G.S. ALLENTOWN & NEW EGYPT

1"=2000'
2000 0 2000 4000
scale feet

SITE LOCATION MAP

WALNFORD MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALNFORD ROAD
ALLENTOWN TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY



Najarian
Associates

Engineers • Planners • Scientists • Surveyors
One Industrial Way West, Eatontown, New Jersey 07724

DRAWN BY	SCALE	DATE	DWG. NO.	FIGURE
W.S.	1"=2000'	1-22-13	6577	1

Y:\6577 Walnford Park LSRP\Figures\6577-Aerial.dwg



© 2014 Microsoft Corporation

LEGEND:

1"=100'
scale 100 0 100 200
feet

AERIAL PHOTO

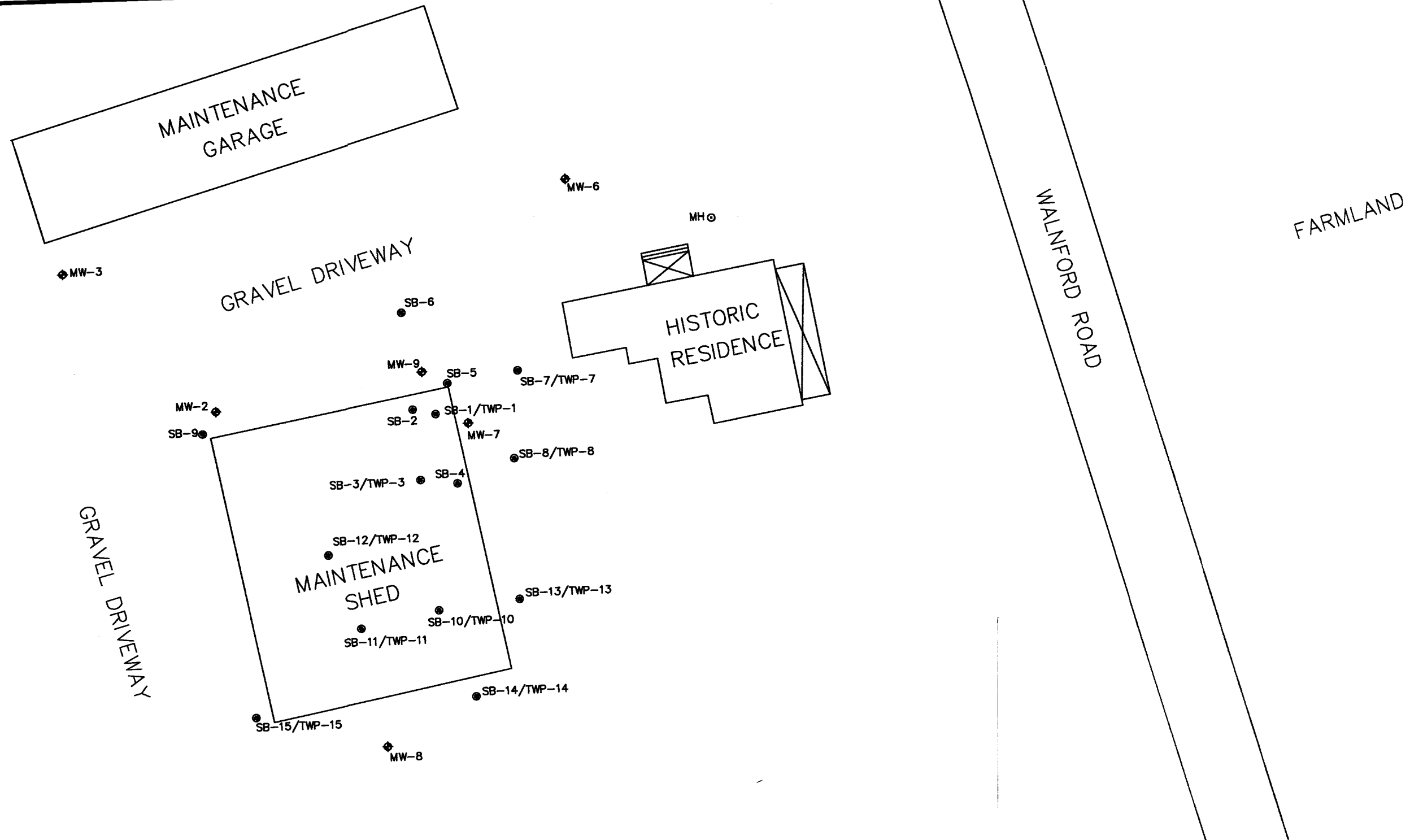
WALNFORD MAINTENANCE FACILITY
BLOCK 49, LOT 2
91 WALNFORD ROAD
ALLENTOWN TOWNSHIP
MONMOUTH COUNTY, NEW JERSEY



Najarian
Associates

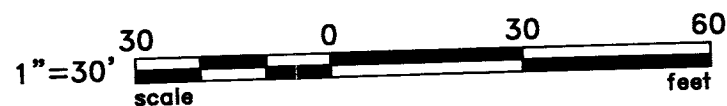
Engineers • Planners • Scientists • Surveyors
One Industrial Way West, Eatontown, New Jersey 07724

DRAWN BY	SCALE	DATE	DWG. NO.	FIGURE
W.S.	1"=100'	1-22-13	6577	2



NOTES

- NJDEP PERMITTED MONITORING WELL
- SOIL BORING/TEMPORARY WELL POINT



DESIGNED		SAMPLE LOCATION MAP			
APPROVED		CHECKED		WALNFORD PARK MAINTENANCE FACILITY BLOCK 49 LOT 2 91 WALNFORD ROAD ALLENTOWN TOWNSHIP, MONMOUTH COUNTY, NJ	
HARRY J. WIDDIS					
		Professional Engineers, Land Surveyors & Planners • Scientists One Industrial Way West, Eatontown, New Jersey 07724 (732) 389-0220 • Facsimile No. (732) 389-8546 Certificate of Authorization Certificate # 24GA27993300			
		N.J. PROFESSIONAL LAND SURVEYOR No. 26384			
DRAWN BY: DPF		SCALE: 1"=30'	DATE: 06-10-15	DRAWING NO: 6577	SHEET NO: FIG. 3

Sample #	HIGHER OF	Table 1 - Mar 13	TWP-12				TWP-11				MW-8				TWP-10				TWP-14				FIELD BLANK				TWP-15				MW-7				TWP-13				MW-9				TRIP BLANK			
Field ID	PQLs	Vapor Intrusion																																												
Lab ID	and	GW	03519-001				03519-002				03519-003				03519-004				03519-005				03519-006				03519-007				03519-008				03519-009				03519-010				03519-011			
Date Sampled:	GWQC	Screening	04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015				04/29/2015			
Depth(ft):	CAS	(ug/L)	5.40				4.31				4.01				4.45				4.27								5.12				4.75				6.81				4.25							
		(ug/L)	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL	Conc	Q	RL	MDL				
Volatiles (ug/L)																																														
Dichlorodifluoromethane	75-71-8	1000	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND		1.00	0.685	ND			
Chloromethane	74-87-3	NS	1		240	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND		1.00	0.493	ND				
Vinyl chloride	75-01-4	1	1		1	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND		1.00	0.463	ND				
Bromomethane	74-83-9	10	20		ND	1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		1.00	0.684	ND		
Chloroethane	75-00-3	5	26000		ND	1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		1.00	0.829	ND		
Trichlorofluoromethane	75-69-4	2000	2000		ND	1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		1.00	0.813	ND		
1,1-Dichloroethene	75-35-4	1	250		ND	1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		
Acetone	67-64-1	6000	21000000		ND	2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		2.00	1.43	ND		
Carbon disulfide	75-15-0	700	1500		ND	1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		1.00	0.505	ND		
Methylene chloride	75-09-2	3	920		ND	2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		2.00	1.99	ND		
tert-Butyl alcohol (TBA)	75-85-0	100	NS		ND	2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		2.00	1.87	ND		
trans-1,2-Dichloroethene	156-60-5	100	520		ND	1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		1.00	0.544	ND		
Methyl tert-butyl ether (MTBE)	1634-04-4	70	580	2.22	1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND		1.00	0.491	ND			
1,1-Dichloroethane	75-34-3	50	50		ND	1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		1.00	0.358	ND		
cis-1,2-Dichloroethane	156-59-2	70	NS		ND	1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		1.00	0.479	ND		
2-Butanone (MEK)	78-93-3	300	2500000		ND	1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		1.00	0.872	ND		
Bromochloromethane	74-97-5	NS	NS		ND	1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		1.00	0.636	ND		
Chloroform	67-66-3	70	70		ND	1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		1.00	0.511	ND		
1,1,1-Trichloroethane	71-55-6	30	13000		ND	1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		1.00	0.485	ND		
Carbon tetrachloride	56-23-5	1	1		ND	1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		1.00	0.668	ND		
1,2-Dichloroethane (EDC)	107-06-2	2	3		ND	1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		1.00	0.573	ND		
Benzene	71-43-2	1	20		ND	1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		1.00	0.388	ND		
Trichloroethene	79-01-6	1	2		ND	1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		1.00	0.357	ND		
1,2-Dichloropropane	78-87-5	1	4		ND	1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		1.00	0.556	ND		
1,4-Dioxane	123-91-1	10	NS		ND	200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		200	82.7	ND		
Bromodichloromethane	75-27-4	1	2		ND	1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		1.00	0.526	ND		
cis-1,3-Dichloropropene	10061-01-5	NS	7		ND	1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		1.00	0.441	ND		
4-Methyl-2-pentanone (MIBK)	108-10-1	NS	900000		ND	1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		1.00	0.867	ND		
Toluene	108-88-3	600	330000		ND	1.00	0.370	0.749	J	1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		1.00	0.370	ND		
trans-1,3-Dichloropropene	10061-02-6	NS	7		ND	1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		1.00	0.416	ND		
1,1,2-Trichloroethane	79-00-5	3	8		ND	1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		1.00	0.633	ND		
Tetrachloroethane	127-18-4	1	31		ND	1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		1.00	0.495	ND		
2-Hexanone	591-78-6	300	NS		ND	1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND		1.00	0.693	ND						

NUDEP Class II-A Specific Ground Water Quality Criteria: Ground Water Quality Standards N.J.A.C. 7:9C, Nov 2005

BOLD Conc

indicates a concentration that exceeds the applicable criteria

BOLD RL

indicates RL that exceeds applicable criteria

BOLD MDL

indicates MDL that exceeds applicable criteria

NS = No Standard Available

ND = Analyte Not Detected At the MDL

J = Concentration detected at a value below the RL and above the MDL for target compounds. For non-target compounds (i.e. TICs) qualifier indicates estimated concentrations.

All qualifiers on individual Volatiles & Semivolatiles are carried down through summation.