140305

NORTH PENN AREA 12 SUPERFUND SITE
WORCESTER TOWNSHIP,
MONTGOMERY COUNTY, PENNSYLVANIA

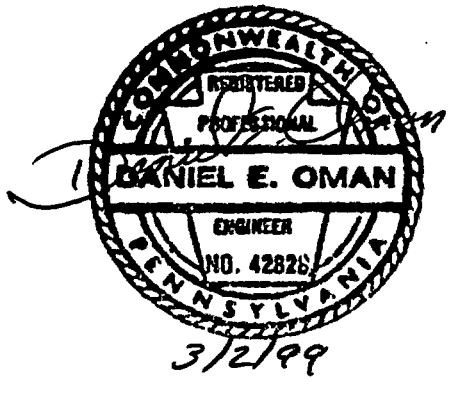
CONSTRUCTION CONTRACT AND SPECIFICATIONS
FOR:

WATER MAIN EXTENSION
REVISION 1

PREPARED FOR:

SCHLUMBERGER RESOURCE MANAGEMENT SERVICES, INC. (SCHLUMBERGER INDUSTRIES, INC.)

March 1999



Clifford E. Kirchof, Jr. PHD
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Project Manager

RMT, INC., MICHIGAN
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ANN ARBOR, MI
734/971-7080 - 734/971-9022 FAX

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MAIN EXTENSION AGREEMENT

THIS MAIN EXTENSION AGREEMENT (hereinafter called "Agreement") is made on this _____ day of _____, 19____, by and between the NORTH PENN WATER AUTHORITY, a municipal corporation organized and existing under and by virtue of the laws of the Commonwealth of Pennsylvania, with its principal office located at 300 Forty Foot Road, Lansdale, Montgomery County, Pennsylvania (hereinafter called "Authority") and RMT, INC. , a corporation lawfully conducting business within the Commonwealth of Pennsylvania, with offices located at 1143 Highland Drive, Suite B, Ann Arbor, Michigan 48108 (hereinafter called "Construction Manager").

BASIS OF AGREEMENT

1. Construction Manager has requested Authority to provide water service to certain real estate, located in the area of Crest Terrace, Heebner Road, Hickory Hill Drive, Landis Road, Potshop Road, Stump Hall Road, Township Line Road, Trooper Road, and Green Briar Drive, commonly known as EPA-North Penn Area 12, Worcester Township, Mongtomery County, within which Construction Manager proposes to connect approximately 121 units (hereinafter called "Project").

2. Construction Manager has submitted plans of the Project to Authority, and Authority has designed the layout of the water system for the Project.

3. Authority is willing to provide water service to the Project upon the terms and conditions set forth in the balance of this Agreement.

NOW, THEREFORE in consideration of the mutual covenants set out in this Agreement and intending to be legally bound hereby, the parties agree as follows:

I. GENERAL CONDITIONS

A. EFFECTIVE DATE: This Agreement shall become effective upon Authority's Board of Directors granting final approval of a water capacity allocation to the Project and all parties executing this Main Extension Agreement.

B. PERMITS, BONDS AND INSURANCE: Authority acknowledges and agrees that it is Authority's obligation to ascertain the building requirements of the municipality or municipalities within which the Project is located. Authority furthers agrees that it is Authority's obligation at Construction Manager's expense, to meet all requirements of the municipality or municipalities within which the Project is located including, but not limited to, obtaining permits, bonds, insurance policies, or certificates, road opening/closing permits, if necessary, and posting the appropriate escrow deposits. All costs associated with permits, bonds and insurance will be detailed on a time and expense not to exceed basis in Appendix A.

The Authority will provide Construction Manager with a certificate of insurance that complies with the requirements set forth in Exhibit 6 of the contract specifications. The certificate of insurance will name RMT, Inc., as an additional insured.

C. RECORD DRAWING: Authority agrees, within thirty (30) days following completion of the water line construction, to provide Construction Manager with two sepia mylar reproducible copies of record drawings accurately depicting the locations of the as-constructed water lines and meter pit locations. Authority will also provide record drawings to Construction Manager on a 3.5 inch, high-density floppy disk in an AUTOCAD format. In addition to as-constructed water line drawings Authority will forward a copy of their inspectors' reports to Construction Manager on a weekly basis.

D. REIMBURSEMENT FOR EXPENSES: Authority shall invoice Construction Manager monthly for costs and expenses incurred during the previous month. Construction Manager agrees to reimburse Authority, within thirty (30) days following invoice approval by Construction Manager, for all reasonable costs and expenses incurred by Authority in the

performance of this Agreement, including but not limited to, engineering, legal, inspection and administrative fees. All invoices shall be fully supported including, but not limited to, time sheets and associated backup documentation. Time sheets and inspection reports will be submitted separately on a weekly basis.

The Construction Manager will review, comment on, approve, or disapprove all invoice submissions within three business days of receipt. If Construction Manager does not comment on, or disapprove the invoice within three business days, the invoice will be considered approved for payment as submitted under the terms of this Section.

E. DEDICATION OF FACILITIES AND EASEMENT: Upon completion of the water supply system and final approval of Authority and Construction Manager Construction Manager will transfer ownership of the system to Authority in accordance with the procedures established for dedication in this Agreement. Construction Manager agrees that Authority, or anyone else with Authority's permission, may make connections with the water system to be dedicated, notwithstanding the fact that such connection is made prior to an offer of dedication. Until dedication, Authority agrees that if work should stop, Construction Manager may, at its option, enter the Project to complete the work using the proceeds from the performance bond and funds on deposit with the Authority.

F. ASSIGNMENT: This Agreement shall be binding upon the heirs, successors and assigns of the parties hereto. It shall not, however, be assigned, except with the written consent of Authority.

G. NOTICES: Any notice given pursuant to this Agreement shall be valid only if given in writing, and shall be deemed sufficiently given if forwarded by certified mail, with sufficient postage attached. The date of any notice provided for in this Agreement shall be the date of deposit in the United States mail. The place to which notice shall be given is set forth in the preamble to this Agreement and shall be binding, unless changed, by either party, in the manner set forth above.

H. GOVERNING LAW: All questions with respect to the construction of this Agreement and the rights and liabilities of the parties shall be determined according to the applicable provisions of the laws of the Commonwealth of Pennsylvania.

I. CAPTIONS: Any article or paragraph, titles or captions contained in this Agreement are for convenience only and shall not be deemed to amplify, modify, or give full notice of the provisions thereof.

J. AMENDMENT: This Agreement may be amended only by written document executed by the parties hereto.

K. ENTIRE AGREEMENT: This Agreement contains the entire understanding between the parties and supersedes any prior written or oral agreements with respect to the subject matter of this Agreement. There are no representations, agreements, arrangements, or undertaking, oral or written, between and among the parties hereto relating to the subject matter of this Agreement which are not fully expressed herein.

II. CONSTRUCTION

A. MATERIALS: All materials used for construction must conform to Authority specifications. No substitutions will be accepted. Pressure regulating devices, double check valves, reduced pressure black flow prevention devices and 5/8-inch by 3/4-inch meter yoke assemblies, with accessories, will be required for residential services.

B. CONSTRUCTION COST ESTIMATE: Construction Manager specifically acknowledges receiving, pursuant to separate agreement, the design of the water system for the Project, construction takeoffs and Authority specifications as to materials required and methods of installation required to be utilized by Authority's subcontractors. Authority agrees to provide Construction Manager with a preliminary construction cost estimate, detailing the quantity, unit prices and labor costs of all portions of the water system to be installed as the Project (the "Improvements"). Construction Manager will review the preliminary construction cost estimate with Authority to ensure its reasonableness, and to

ensure that appropriate consideration has been given to rock excavation and Project contingencies. Authority will add appropriate time and expense estimates for obtaining permits, regulatory approvals , Authority inspection, chlorination, administrative, legal and engineering fees to be incurred by Authority during the course of the Project. The costs of rock excavation and/or providing and installing select backfill will be included in the final construction cost estimate and the amount of the construction deposit referred to in Paragraph IV.A.

When the final construction cost estimate is completed, Authority will advise Construction Manager whether Authority or its designee will complete the construction at a price not to exceed that specified on the final construction cost estimate as adjusted for approved change orders. The final construction cost estimate including Authority's time and expense cost estimates for all fees and costs described in this contract will be attached to this Agreement as Exhibit A.

C. METER SETTINGS: In addition to the foregoing, Construction Manager will provide meter settings for meters to be installed by Authority in accordance with drawings attached hereto as Exhibit B. Approximately one hundred twenty-one (121) meter pits shall be installed by Authority, at Construction Manager's expense. The costs associated with the meter pit installation will be reflected in the final construction cost estimate, and the amount of the construction deposit referred to in Paragraph IV.A.

D. AUTHORITY CONSTRUCTION: Authority or Authority's contractor shall provide and install the Improvements in accordance with the water system design provided by Authority and Authority's rules, regulations and specifications. Authority agrees to pursue diligently construction of the Improvements, subject to inspection by Authority and Construction Manager, Authority shall be compensated for all costs of its employees engaged in the inspection of the Project. The Construction Manager will not be required to reimburse the authority for engineering, legal, inspection and administrative fees associated with the correction of installation deficiencies caused by Authority's subcontractor. No Improvements

shall be used until Authority and Construction Manager approve the construction and verifies that Authority specifications have been met.

Actual connection of any Improvements to lines of Authority shall be performed by Authority personnel, or under the direct supervision of Authority's personnel, at Construction Manager's expense. All wet taps, services taps and water lines from the main to the curb shall be installed by Authority personnel, at Construction Manager's expense. Locations for all service line connections and meter pits shall be marked by Construction Manager in a manner approved by Authority. After service lines and meter pits are installed by Authority and approved by Construction Manager, Authority shall ensure that all service lines, curb boxes, meter pits and appurtenances are protected. If water lines, service lines and/or appurtenances are damaged after installation, all cost associated with locating, repairing and/or replacing such damages prior to final acceptance shall be borne by Construction Manager unless such damage was caused by Authority or Authority's subcontractors. All costs incurred as a result of performing the services or providing the materials required by this paragraph shall be borne by responsible party

Authority shall have no liability or responsibility of any kind in connection with the performance of any work by Construction Manager, or for any damage or loss of any kind arising from such work. Regardless of whether any construction or work performed by Construction Manager has been accepted by Authority, Construction Manager specifically indemnifies and saves harmless Authority from any and all damages to person or property, suits, liabilities, claims or demands of any type or nature in any way arising out of or connected with Construction Manager's negligence or willful misconduct in connection with the Project, including, but not limited to, cost of litigation of any type or nature. This indemnification and hold harmless will not apply to the extent damages, suits, liabilities, claims or demands of any type or nature are caused by Authority or Authority's subcontractors negligence or willful misconduct.

III. DEDICATION AND MAINTENANCE OF IMPROVEMENTS

Upon completion of construction, the Improvements shall be inspected by Authority. Authority will disinfect and pressure test the water lines, at Construction Manager's expense as stipulated in the time and material expenses outlined by Authority in Appendix A, under the direct observation of Authority. Should the water line fail to pass the initial chlorination and pressure testing, Construction Manager is not responsible for the costs associated with corrective work and additional testing. After final inspection by Authority and acceptance by Construction Manager, Authority shall issue a certificate of completion. Upon receiving the certificate of completion, Construction Manager shall offer all Improvements for dedication to Authority. Authority shall provide Construction Manager with as-built plans, outstanding inspection reports and legal descriptions of all Improvements prior to acceptance by Construction Manager. Upon receipt of the foregoing, Authority shall prepare appropriate deeds of dedication and shall accept dedication of the Improvements. After the dedication and acceptance, Authority shall maintain, at its sole cost and expense, all matters included within the dedication, and Authority will return the unused portion of the escrow fund with accrued interest as permitted by the Municipality Authorities Act to Construction Manager.

IV. FUNDING

A. DEPOSIT: For each phase of the project the Construction Manager agrees to deposit into an escrow fund, within fifteen (15) days of the anticipated phase start date, that sum of money specifically set forth on the deposit schedule which is attached hereto as Exhibit A. The deposit schedule lists those sums required by the final construction cost estimate, Authority tapping fees and the builder's water deposit. Tapping fees are imposed in accordance with Act 203 of 1990 and Authority's Fee Schedule and Resolution implementing tapping fees. Construction Manager specifically acknowledges that Construction Manager has been afforded the opportunity to review Authority's fees and charges set forth in this Agreement and specifically agrees to the validity of same. The Builder's Water Deposit of

Fifty Dollars ($50.00) per equivalent dwelling unit (EDU) is provided to charge Construction Manager for any of the following unauthorized uses of water:

1. Obtaining unmetered water from fire hydrant by Construction Manager - Two Thousand Dollars ($2,000.00) for each violation or day of violation.
2. Obtaining unmetered water from service lines by Construction Manager - One Hundred Dollars ($100.00) for each violation or day of violation.
3. Initiating water service prior to the installation of a meter by Construction Manager - Fifty Dollars ($50.00) for each violation or day of violation.

B. USE OF DEPOSIT AND RELEASE FROM DEPOSIT: All sums on deposit with Authority may be used to reimburse Authority for all expenses incurred by it as a result of this Agreement. Construction Manager agrees that if at any time during the existence of this Agreement, the amount on deposit is insufficient to meet the costs and expenses of any of Construction Manager's obligations pursuant to this Agreement, Construction Manager will within fifteen (15) business days increase the amount on deposit by such additional amounts as are required to cover revised estimates of construction costs or increased inspection, legal or Authority administrative fees.

Authority shall have fifteen (15) business days from the receipt of any written notice to release a portion of the deposit to verify that the work for which payment is requested has been completed in accordance with Authority rules, regulations and specifications. Authority agrees to release funds for work which has been verified as satisfactorily completed by Authority, subject to that retainage and accrued interest as permitted by the Municipality Authorities Act.

C. FINAL SETTLEMENT: Upon completion of construction, fulfillment of Authority and Construction Manager's obligations under this Agreement (specifically those regarding

payments due Authority), dedication of the facilities and acceptance of dedication by Construction Manager and subsequently by Authority, Authority shall release the balance of retainage due to its subcontractors performing work. Regardless of which party performs construction, Authority shall also release unused escrow funds with accrued interest and the balance of the Builder's Water Deposit then remaining, provided that all payments required of Construction Manager have been made. If the deposit is insufficient to cover the obligations of Construction Manager pursuant to this Agreement, Construction Manager shall pay the amount of the shortfall to Authority within fifteen business days (15) days after receiving, reviewing and approving Authority's statement. Construction Manager will review, comment, approve or disapprove the statement within three business days of receipt. If Construction Manager does not comment or disapprove the statement within three business days the statement will be considered approved and paid as submitted under the terms of this section. Authority's return of the balance of the escrow fund with accrued interest, or receipt of payment from Construction Manager, as appropriate, shall terminate the rights and obligations of the parties to this Agreement, subject to the provisions of the maintenance obligation imposed upon Construction Manager by this Agreement.

D. DISPUTE RESOLUTION: In the event of a dispute or difference of opinion in any way arising out of the terms and conditions of this Agreement, the parties shall have ten (10) working days within which to resolve their dispute. If the dispute is not resolved, the parties shall have five (5) working days to mutually agree upon an impartial arbitrator who shall decide the dispute and whose decision shall be final. If the parties are unable to mutually agree upon an arbitrator, each party shall, within five (5) additional working days, select their own arbitrator. The arbitrators selected by the parties shall, within ten (10) working days, select the third arbitrator, and the dispute shall be resolved by majority decision of the three arbitrators. The decision of the arbitrators shall be final and binding upon the parties.

IN WITNESS WHEREOF, the parties, intending to be legally bound, have executed this document the day and the year first written above.

NORTH PENN WATER AUTHORITY

By: _____
Chairman

Attest: _____
Secretary

(AUTHORITY SEAL)
RMT, Inc.

By: _____
Director of Construction Management

Attest: _____
Secretary

(CORPORATE SEAL)

EXHIBIT 1

SCOPE OF WORK

The following Scope of Services will be performed under this contract:

1. Obtain all right of ways for areas affected by construction. (By CONTRACTOR)

2. Obtain all construction permits and approvals from Worcester Township. (By CONTRACTOR)

3. Submit shop drawings for approval by CONSTRUCTION MANAGER and procure products as specified herein. (By CONTRACTOR)

4. Restore all landscaping for approval by property owners in areas affected by construction. (By CONTRACTOR)

5. Participate in weekly progress meetings and maintain communications with CONSTRUCTION MANAGER according to these specifications. (By CONTRACTOR)

6. Provide all labor, materials, and equipment necessary to install all piping, valves, hydrants, thrust blocks, and backfill materials as specified in the Plans and Specifications, and on the bid sheet. (By Subcontractor)

7. Restore all pavement for approval by Worcester Township, other authority's having jurisdiction over such work and individual property owners as appropriate. (By Subcontractor)

8. Pressure test and disinfect piping as specified herein. (By Subcontractor)

9. Maintain traffic control in accordance with PENNDOT Specifications during all construction activities. (By Subcontractor)

10. Participate in weekly progress meetings and maintain communications with CONSTRUCTION MANAGER according to these specifications. (By Subcontractor)

EXHIBIT 2

TECHNICAL SPECIFICATIONS

The following Technical Specifications are provided for general guidance to the CONTRACTOR. Not all of the items or requirements stated in the Specifications are included in this Agreement. The CONTRACTOR shall resolve any apparent conflicts or inconsistencies with the CONSTRUCTION MANAGER before proceeding with the Work.

SECTION	TITLE
00900	Sample Forms • Application for Payment • Work Change Directive • Change Order • Certificate of Substantial Completion
01010	Summary of Work
01025	Measurement and Payment
01050	Field Engineering
01060	Regulatory Requirements
01121	Health and Safety
01300	Submittals
01310	Audiovisual Tape Coverage
01400	Quality Control
01500	Construction Facilities
01560	Temporary Controls
01600	Material and Equipment
01700	Contract Closeout
02210	Excavation and Backfill of Water Main
02211	Blacktop Restoration
02660	Water Distribution
02910	Landscape Restoration

APPLICATION FOR PAYMENT NO. _____

To: _____ (OWNER)
From: _____ (CONTRACTOR)
Contract: _____
Project: _____
OWNER's Contract No._____. ENGINEER's Project No._____
For Work accomplished through the date of:_____.

1.	Original Contract Price:	$_____
2.	Net change by Change Orders and Written Amendments (+ or -):	$_____
3.	Current Contract Price (1 plus 2):	$_____
4.	Total completed and stored to date:	$_____
5.	Retainage (per Agreement):	
	_____% of completed Work: $_____	
	_____% of stored material: $_____	
	Total Retainage:	$_____
6.	Total completed and stored to date less retainage (4 minus 5):	$_____
7.	Less previous Application for Payments:	$_____
8.	**DUE THIS APPLICATION (6 MINUS 7):**	$_____

Accompanying Documentation:

CONTRACTOR'S Certification:

The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of Work done under the Contract referred to above have been applied on account to discharge CONTRACTOR's legitimate obligations incurred in connection with Work covered by prior Applications for Payment numbered 1 through _____ inclusive; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective.

Dated _____ _____
CONTRACTOR

By:_____

State of _____
County of _____
Subscribed and sworn to before me this _____
day of _____, _____

_____
Notary Public
My Commission expires: _____

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Dated _____ _____
ENGINEER

By: _____

EJCDC No. 1910-8-E (1996 Edition)
Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specification Institute.

APPLICATION FOR PAYMENT

INSTRUCTIONS

A. GENERAL INFORMATION

The sample form of Schedule of Values is intended as a guide only. Many projects require a more extensive form with space for numerous items, descriptions of Change Orders, identification of variable quantity adjustments, summary of materials and equipment stored at the site and other information. It is expected that a separate form will be developed by Engineer and Contractor at the time Contractor's Schedule of Values is finalized. Note also that the format for retainage must be changed if the Contract permits (or the law provides), and Contractor elects to deposit securities in lieu of retainage. Refer to Article 14 of the General Conditions for provisions concerning payments to Contractor.

B. COMPLETING THE FORM

The Schedule of Values, submitted and approved as provided in paragraphs 2.05.B.3 and 2.07 of the General Conditions, should be reproduced as appropriate in the space indicated on the Application for Payment form. Note that the cost of materials and equipment is often listed separately from the cost of installation. Also, note that each Unit Price is deemed to include Contractor's overhead and profit.

All Change Orders affecting the Contract Price should be identified and included in the Schedule of Values as required for progress payments.

The form is suitable for use in the Final Application for Payment as well as for Progress Payments; however, the required accompanying documentation is usually more extensive for final payment. All accompanying documentation should be identified in the space provided on the form.

C. LEGAL REVIEW

All accompanying documentation of a legal nature, such as Lien waivers, should be reviewed by an attorney, and Engineer should so advise Owner.

Application No._____ Date:_____

ITEM	UNIT PRICE	ESTIMATED QUANTITY	SCHEDULE OF VALUES AMOUNT	QUANTITY COMPLETED	AMOUNT	%	MATERIAL STORED	AMOUNT COMPLETED AND STORED
1.	$		$		$		$	$
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
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16.								
17.								
18.								
19.								
20.								
21.								
22.								
23.								
24.								
25.								
26.								
27.								
28.								
29.								
30.								
TOTAL			$		$		$.	$

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER _____
CONTRACTOR _____
Contract: _____
Project: _____
OWNER's Contract No. _____ ENGINEER's Project No. _____

You are directed to proceed promptly with the following change(s):
Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If OWNER or CONTRACTOR believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change in Contract Price:

☐ Unit Prices

☐ Lump Sum

☐ Cost of the Work_____

Estimated increase (decrease) in Contract Price:
$_____.
If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times:
Substantial Completion: _____ days;
Ready for final payment: _____ days.

RECOMMENDED:

_____
ENGINEER
By: _____

AUTHORIZED:

_____
OWNER
By: _____

CHANGE ORDER

No. _____

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER _____
CONTRACTOR _____
Contract: _____
Project: _____
OWNER's Contract No. _____ ENGINEER's Contract No. _____
ENGINEER _____

You are directed to make the following changes in the Contract Documents:
Description:

Reason for Change Order:

Attachments: (List documents supporting change)

CHANGE IN CONTRACT PRICE:
Original Contract Price $_____
Net Increase (Decrease) from previous Change Orders No. ___ to ___: $_____
Contract Price prior to this Change Order: $_____
Net increase (decrease) of this Change Order: $_____
Contract Price with all approved Change Orders: $_____

CHANGE IN CONTRACT TIMES:
Original Contract Times: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net change from previous Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net increase (decrease) this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____ (days or dates)

AR002874

RECOMMENDED:

By: _____
ENGINEER (Authorized Signature)

Date: _____

APPROVED:

By: _____
OWNER (Authorized Signature)

Date: _____

ACCEPTED:

By: _____
CONTRACTOR(Authorized Signature)

Date: _____

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Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

CERTIFICATE OF SUBSTANTIAL COMPLETION

DATE OF ISSUANCE _____

OWNER _____
CONTRACTOR _____
Contract: _____
Project: _____

OWNER's Contract No. _____ ENGINEER's Project No. _____

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To _____
OWNER

And To _____
CONTRACTOR

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

_____
DATE OF SUBSTANTIAL COMPLETION

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

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Prepared by the Engineers' Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees shall be as follows:

OWNER:_____

_____

_____

CONTRACTOR:_____

_____

_____

_____

The following documents are attached to and made a part of this Certificate:

[For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by Contract Documents.]

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Executed by ENGINEER on _____
Date

_____
ENGINEER

By: _____
(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on _____
Date

_____
CONTRACTOR

By: _____
(Authorized Signature)

OWNER accepts this Certificate of Substantial Completion on _____
Date

_____
OWNER

By: _____
(Authorized Signature)

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Work Covered by Contract Documents

B. Contract Method

C. General Sequence of Construction

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of this Contract consists of, but is not necessarily limited to, the following:

1. Obtain all right of ways for areas affected by construction. (By CONTRACTOR)
2. Obtain all construction permits and approvals from Worcester Township. (By CONTRACTOR)
3. Submit shop drawings for approval by CONSTRUCTION MANAGER and procure products as specified herein. (By CONTRACTOR)
4. Restore all landscaping for approval by property owners in areas affected by construction. (By CONTRACTOR)
5. Participate in weekly progress meetings and maintain communications with CONSTRUCTION MANAGER according to these specifications. (By CONTRACTOR)
6. Provide all labor, materials, and equipment necessary to install all piping, valves, hydrants, thrust blocks, and backfill materials as specified in the Plans and Specifications, and on the bid sheet. (By Subcontractor)
7. Restore all pavement for approval by Worcester Township, other authority's having jurisdiction over such work and individual property owners as appropriate. (By Subcontractor)
8. Pressure test and disinfect piping as specified herein. (By Subcontractor)
9. Maintain traffic control in accordance with PENNDOT Specifications during all construction activities. (By Subcontractor)
10. Participate in weekly progress meetings and maintain communications with CONSTRUCTION MANAGER according to these specifications. (By Subcontractor)

PART 2 PRODUCTS

2.01 MATERIALS

A. Unless otherwise noted, CONTRACTOR shall provide all required materials, Health and Safety and other supplies and incidentals to fully complete all the Work covered under the this specification section in strict accordance with the Contract Documents as approved by the CONSTRUCTION MANAGER.

2.02 EQUIPMENT

A. Unless otherwise noted, CONTRACTOR shall provide all required construction equipment to fully complete all of the Work covered under this specification in strict accordance with the Contract Documents as approved by the CONSTRUCTION MANAGER.

PART 3 EXECUTION

3.01 GENERAL SEQUENCE OF CONSTRUCTION

A. CONTRACTOR's highest priority is the installation of water main along Trooper Road, thereby providing service to a new business; Techni Tool.

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for unit price measurement and payment.

1.02 PROCEDURES

A. Lump Sum Bid is full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the Work under that item.

B. CONSTRUCTION MANAGER shall review, comment, approve or disapprove all requests for payment directed to CONTRACTOR within three business days of CONSTRUCTION MANAGER's receipt of invoice and documentation. If CONSTRUCTION MANAGER fails to comment or disapprove the invoice within three business days, the invoice shall be considered approved for payment as submitted.

C. Completed Work will be measured by CONSTRUCTION MANAGER according to U.S. Standard measure units to determine final quantities.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01050
FIELD ENGINEERING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submittals.

B. Quality Assurance.

C. CONTRACTOR Survey Requirements.

1.02 RELATED REQUIREMENTS

A. Section 01400 - Quality Control.

B. Section 01700 - Contract Closeout.

1.03 SUBMITTALS

A. On request, submit data demonstrating qualifications of persons providing services.

B. On request, submit documentation verifying accuracy of survey Work.

C. Maintain complete, accurate log of control and survey Work as it progresses. Submit Record Documents under provisions of Section 01700.

1.04 QUALITY ASSURANCE

A. Use skilled persons, trained and experienced in the necessary tasks and techniques, for the proper performance of this Work.

B. Verify locations of survey control points prior to starting Work. Promptly notify CONSTRUCTION MANAGER of any discrepancies discovered.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 CONTRACTOR SURVEY REQUIREMENTS

A. CONTRACTOR will perform stake-out which shall consist of the following:

1. Control for field survey shall be established from edge of roadway.

B. Placement of stakes at a minimum of one hundred feet apart to delineate the edge of the right-of-way.

C. Stakes offset as needed to locate fire hydrants.

END OF SECTION

SECTION 01060
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Description.

B. Permits.

1.02 DESCRIPTION

A. Give all notices; observe and comply with all laws, rules, regulations and ordinances applicable to the Work.

B. Notify area utility companies before beginning Work, in accordance with state and local regulations.

1.03 PERMITS

A. Obtain and pay for all construction permits and licenses and pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of CONTRACTOR's Bid.

B. CONTRACTOR will obtain all road opening permits, both state and local, stream crossing, and sediment and erosion permits.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01121
HEALTH AND SAFETY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General requirements.

B. Site characterization.

C. Submittals.

D. Health and safety officer.

E. Personnel health and safety.

F. Contingency and emergency response plan.

1.02 GENERAL REQUIREMENTS

A. CONTRACTOR shall be responsible for the safety of persons and property on-site and for the protection of persons off site and the environment to the extent that they may be affected by the conduct of Work. CONTRACTOR shall comply with and enforce compliance by its employees and the employees of all of its Subcontractors, agents, and invitees, with all safety requirements of the Contract documents, all applicable federal, state, and local statues, regulations, and ordinances.

B. Unforeseen Hazards: Should any unforeseen or site peculiar safety-related factor, hazard, or condition become evident during the performance of Work at site, it shall be CONTRACTOR'S responsibility to bring such to the attention of CONSTRUCTION MANAGER verbally and in writing as quickly as possible, for resolution. In the interim, take prudent action to establish and maintain safe working conditions and to safeguard employees, the public, CONSTRUCTION MANAGER, and the environment.

1.03 SITE CHARACTERIZATION

A. Work at Site may involve potential contact with soils and groundwater containing low levels of chlorinated solvents during installation of water main.

1.04 SUBMITTALS

A. CONTRACTOR'S Site-Specific Health and Safety Plan:

1. After the Notice to Proceed and prior to mobilization, Contractor must submit their own or adopt Construction Manager's Site-specific Health

and Safety Plan. As a minimum, site Health and Safety Plan must address all aspects of worker protection.

2. CONSTRUCTION MANAGER will review CONTRACTOR'S Site-specific Health and Safety Plan.

1.05 HEALTH AND SAFETY OFFICER

A. Provide a Health and Safety Officer on-site during the execution of all work. The Health and Safety Officer shall monitor all work activities at the site as they pertain to health and safety as regulated by OSHA.

1.06 PERSONNEL HEALTH AND SAFETY

A. Emergency and First Aid Equipment

1. Locate and maintain in appropriate locations on-site emergency and first aid equipment. The required equipment shall include, at a minimum:

a. First aid / Bloodborne pathogen kits to accommodate on-site personnel.

b. Telephone.

c. Fire extinguisher.

B. Safety Meetings: Conduct safety meetings, mandatory for all site personnel, on a regular weekly, etc., basis and additionally as required by special or work-related conditions.

1.07 CONTINGENCY AND EMERGENCY RESPONSE PLANS

A. General: Prior to mobilization to site, prepare on-site Contingency and Emergency Response Plans to ensure the safety of on-site personnel.

B. On-site Contingency and Emergency Response Plan: Address the standard operating procedures to be implemented during emergency situations. Emergency situations and responses to be addressed shall include, as a minimum, the following:

1. In the event of injury to on-site personnel requiring immediate medical attention, implement the following protocol:

a. Notify CONSTRUCTION MANAGER and the Health and Safety Officer.

b. Activate the local emergency medical system by dialing 911.

c. Administer appropriate first aid.

d. EMS will transport personnel to the specified hospital along the most direct route which will be determined by the responding agency to commencing site work.

2. Develop techniques and recommended procedure for immediate first aid emergency response with local medical facilities.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Construction Progress Schedules.

B. Schedule of Values.

C. Product Data/Cut-Sheets.

D. Audiovisual Tape Coverage.

1.02 RELATED REQUIREMENTS

A. Section 01700 - Contract Closeout

1.03 PROCEDURES

A. Deliver submittals to CONSTRUCTION MANAGER.

B. Identify Project, CONTRACTOR, Subcontractor, major Supplier; identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents.

C. Comply with construction schedule for submittals related to Work progress. Coordinate submittal of related items.

D. After CONSTRUCTION MANAGER reviews submittal, revise and resubmit as required; identify changes made since previous submittal.

E. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.04 CONSTRUCTION PROGRESS SCHEDULE

A. Submit horizontal bar chart with separate bar for each major trade, subcontractor, or operation, identifying first Work day of each week.

B. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Show projected percentage of completion of each item of Work at each Application for Progress Payment.

1.05 SCHEDULE OF VALUES

A. Submit typed schedule of values. Identify each line item with number and title of major Specifications Sections.

B. Include in each line item a directly proportional amount of CONTRACTOR's overhead and profit.

1.06 PRODUCT DATA/CUT-SHEETS

A. Submit the number of opaque reproductions which CONTRACTOR requires, plus three copies which will be retained by CONSTRUCTION MANAGER.

B. Present in a clear and thorough manner. Title each submittal with Project name; specification section, name of product or material, and supplier.

C. Submittals shall be numbered consecutively, and be submitted through the Contractor. The Contractor shall review all submittals from Subcontractors to ensure that the provisions of the specifications are met.

1.07 AUDIOVISUAL TAPE COVERAGE

A. CONTRACTOR shall submit the original and one copy of the pre-construction and post-construction audiovisual tape records of the construction site to the CONSTRUCTION MANAGER within 15 days of recording event completion.

1.08 CONTRACTOR REVIEW

A. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements.

B. Coordinate submittals with requirements of Work and of Contract Documents.

C. Sign or initial each sheet of shop drawings and product data, and each sample label to certify compliance with requirements of Contract Documents. Notify CONSTRUCTION MANAGER in writing at time of submittal of any deviations from requirements of Contract Documents.

D. Do not fabricate products or begin Work which requires submittals until return of submittal with CONSTRUCTION MANAGER acceptance.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01310
AUDIOVISUAL TAPE COVERAGE

PART 1 GENERAL

1.01 SUMMARY

A. CONTRACTOR shall furnish to CONSTRUCTION MANAGER an audiovisual tape records for the construction site for the purpose of establishing, for the record, conditions prior to and after construction. The audio-video taping shall be of a professional quality that will clearly log an accurate visual description of existing conditions. The tape shall be in color.

1.02 RELATED REQUIREMENTS

A. Section 01300 - Submittals

1.03 SUBMITTALS

A. Furnish as prescribed under Section 01300. The original tape shall be retained by CONSTRUCTION MANAGER and maintained in a safe environment in case additional copies of the tape are required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Audiovisual Tape.

1. Tapes shall be VHS format.

PART 3 EXECUTION

3.01 AUDIOVISUAL TAPE

A. The tape coverage must include all existing cross streets, driveways, sidewalks, curbs, ditches, shrubbery or other structures located on the construction site. Where construction may necessitate a local detour of traffic, additional planning of the full highway right-of-way will be required. It will not be necessary to cover side street detours, only areas within the full highway right-of-way of the street along which the construction is being done.

B. Both sides of the entire construction site must be recorded with the rate of speed in the general direction of travel not to exceed 48 feet per minute. Panning rates and zoom-in zoom-out rates shall be controlled sufficiently so that playback will product clarity of the object viewed, and locations must be identified by audio and video means at intervals of not more than 100 lineal feet.

C. The tape must be recorded during a time of good visibility. Taping should not be made during period of precipitation, snow, leaves, or other natural debris. To ensure proper perspective, the distance from the ground to the camera lens shall not be less than six (6) feet, and CONSTRUCTION MANAGER shall have the authority to designate what area may be omitted and/or added for audio-video coverage.

D. The recording must be made on a continuous running tape on which sound and video information can be recorded.

E. To preclude the possibility of tampering or editing in any manner, all video recordings must be made by electronic means and display continuously and simultaneously generated transparent digital information to include the date and time of recording, as well as the corresponding engineering stationing numbers.

F. For ease of playback, the speed and electronics of the video tape shall be equal to that which is standard to the electronic industry.

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. General Quality Control.

B. Workmanship.

C. Manufacturer's Instructions.

D. Manufacturer's Certificates.

1.02 QUALITY CONTROL, GENERAL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.

1.03 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specifications indicate more rigid standards or more precise workmanship.

B. Perform Work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses and vibration.

1.04 MANUFACTURER'S INSTRUCTIONS

A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from CONSTRUCTION MANAGER before proceeding.

1.05 MANUFACTURER'S CERTIFICATES

A. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Sanitary Facilities.

B. Barriers.

C. Protection of Installed Work.

D. Cleaning During Construction.

E. Removal.

F. Open Excavations.

1.02 SANITARY FACILITIES

A. Provide and maintain enclosed, portable, self-contained sanitary facilities.

1.03 BARRIERS

A. Provide a minimum of twenty-four (24) flashing roadway barricades to warn motorists of roadway hazard. The barricades shall be placed around construction equipment at night and provide a warning visible to automobiles traveling at night. Use of more barricades may be required at the discretion of the CONSTRUCTION MANAGER.

1.04 PROTECTION OF WORK

A. Provide temporary protection for Work in progress and items installed.

B. Control traffic in construction area to minimize damage to completed Work. Traffic control on all State and Township roadways shall be in accordance with Pennsylvania Department of Transportation (PDT) Specifications; Publication 203, Figure 10A and 10B

1.05 CLEANING DURING CONSTRUCTION

A. Control accumulation of waste materials and rubbish; periodically dispose of off-site.

B. Maintain site in a clean and orderly condition.

C. Roadways shall be cleaned at the end of the day.

1.06 REMOVAL

A. Remove temporary materials, equipment, services, and construction prior to final inspection.

B. Restore existing facilities used during construction to original condition, or as otherwise specified by CONSTRUCTION MANAGER.

1.07 OPEN EXCAVATIONS

A. Excavations shall not be left open after normal construction hours.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01560
TEMPORARY CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Roadway Protection.

B. Erosion and Sediment Control.

C. Noise Control.

D. Water Control.

1.02 RELATED REQUIREMENTS

A. Section 01500 - Construction Facilities

1.03 EROSION AND SEDIMENT CONTROL

A. Minimize amount of bare soil exposed at one time.

B. Plan and execute construction to control surface drainage from cuts and fills, and from borrow and waste disposal areas. Prevent erosion and sedimentation.

C. Cover all exposed soil with clean straw at the end of each work day .

D. Conduct operations to avoid washing or deposition of materials into waterways or off-site. Silt fence shall be installed perpendicular to trench in drainage areas. Silt fence may be required adjacent to streams and shall be placed at the discretion of the CONSTRUCTION MANAGER.

E. Do not track or spill mud, clay, gravel, or other materials onto adjacent streets or off-site. Clean off inadvertent tracking and spills immediately.

F. Periodically inspect earthwork for evidence of erosion and sedimentation; promptly apply corrective measures. Earthwork shall also be inspected within 24 hours of any predicted significant precipitation event.

1.04 NOISE CONTROL

A. Limit the operation of heavy equipment and machinery to the hours of 7:00 a.m. to 7:00 p.m.

1.05 WATER CONTROL

A. Maintain or relocate existing ditches and spillways.

B. Do not stockpile material such that it restricts surface drainage.

C. If it is necessary to interrupt existing surface water drainage, provide and maintain temporary piping or ditching until permanent drainage is provided.

D. Maintain excavations and trenches free of water. Provide and operate pumping equipment of a capacity to control water flow out of excavations and trenches.

E. Pump discharge must be diverted into a silt bag, straw bales or appropriate filtering device to prevent erosion or deposit of silt. Remove equipment when no longer needed for temporary water control.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Products.

B. Transportation and Handling.

C. Storage and Protection.

D. Disposal of Excess Fill.

E. Substitutions.

1.02 RELATED REQUIREMENTS

A. Section 01400 - Quality Control

B. Section 01700 - Contract Closeout

1.03 PRODUCTS

A. Products include material, equipment, and systems.

B. Do not use materials and equipment removed from existing structure or system, except as specifically required, or allowed by Contract Documents.

C. Comply with Specifications and referenced standards as minimum requirements.

1.04 TRANSPORTATION AND HANDLING

A. Transport products by methods which prevent product damage; deliver in undamaged condition.

B. Provide equipment and personnel to handle products by methods which prevent soiling or damage.

C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

1.05 STORAGE AND PROTECTION

A. Store loose granular material on solid surfaces in a well-drained area. Prevent granular material from mixing with all other foreign matter.

B. Arrange storage to provide access for inspection. Periodically inspect to insure that products are undamaged and are maintained under required conditions.

C. Store pipe and fittings in an accessible area, away from all road traffic. No more than one truck load of pipe may be strung along the road at any time.

1.06 DISPOSAL OF EXCESS FILL

A. Submit to CONSTRUCTION MANAGER the disposal site location for excess materials which may not be disposed on-site before beginning Work.

B. Dispose of excess materials off-site in an appropriate manner, with sediment and erosion controls, as needed.

1.07 SUBSTITUTIONS

A. Products specified must be used. Substitutions shall not be permitted without prior written consent of the CONSTRUCTION MANAGER.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Closeout Procedures.

B. Final Cleaning.

C. Project Record Documents.

D. Operation and Maintenance Data.

E. Warranties and Bonds.

F. Spare Parts and Maintenance Materials.

1.02 RELATED REQUIREMENTS

A. Section 01050 - Field Engineering.

B. Section 01500 - Construction Facilities

C. Section 01600 - Material and Equipment.

1.03 CLOSEOUT PROCEDURES

A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.

B. In addition to submittals required by Conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

1.04 FINAL CLEANING

A. Execute prior to final walk-through.

B. Clean installed equipment and fixtures.

C. Clean drainage and collection systems.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain on-site, one set of the following project record documents; record actual revisions of the Work:

1. Contract Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other Modifications to the contract.

5. Review shop drawings, product data, and samples.

B. Store project record documents separately from construction documents.

C. Keep documents current; do not permanently conceal any Work until required information has been recorded.

D. At contract closeout, submit documents with transmittal letter containing date, Project title, CONTRACTOR's name and address, list of documents, and signature of CONTRACTOR.

1.06 WARRANTIES AND BONDS

A. Provide duplicate, notarized copies when specified in specific Section. Execute CONTRACTOR's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.

B. Submit material before final application for payment. For equipment put into use with OWNER's permission during construction, submit within ten days after first operation.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02210
EXCAVATION AND BACKFILL OF WATER MAIN

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: The Work shall include the excavation, trenching, the complete and continual dewatering of excavation, sheeting, bracing and shoring of sides of excavation, backfilling around structures and over pipe lines, and the disposal of excess excavated material.

1.02 DEFINITIONS

A. **Suitable Fill.** Fill that is excavated from trench, and suitable to compact in lifts to fill trench. No yielding soils or rocks larger than 6". Suitable fill is free of organic top soils and plant material.

B. **Unsuitable Fill.** Fill excavated from the trench is not suitable for compaction in lifts. Unsuitable fill will be determined by field engineer.

C. **2A Modified.** Granular fill shall be defined as 2A Modified gravel, or crushed stone, free from lumps of clay, soft or flaky material.

D. **Subgrade.** The undisturbed earth or the compacted soil layer immediately below granular subbase or topsoil materials.

E. **Base.** The layer of specified materials of designed thickness placed on the subgrade as part of the pavement structure.

1.03 REQUIREMENTS INCLUDED

A. Project Conditions

B. Trench Backfill Material

C. Limits of Excavation

D. Length of Trench Open

E. Method of Excavation

F. Stability of Excavation

G. Backfilling Trenches

H. Crossing Existing Structures

I. Method of Excavation In Rock

J. Backfill Rock Excavation Areas

K. Disposal of Excavation Material

L. Roadside Ditches and Culverts

M. Regrading

1.04 PROJECT CONDITIONS

A. Existing Utilities. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

B. CONTRACTOR shall notify all utilities, three working days prior to starting any excavation with power equipment.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with CONSTRUCTION MANAGER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

2. Do not interrupt existing utilities service to facilitates occupied by others, during occupied hours, except when permitted by CONSTRUCTION MANAGER and then only after acceptable temporary utility services have been provided.

3. Provide minimum of two working days notice to CONSTRUCTION MANAGER, and provide written notice to property owner before interrupting any utility.

C. Use of explosives is not permitted, unless authorized by Field Engineer. Blasting permits, pre-blast survey and seismic recordings must be conducted, and be approved by Engineer.

D. Protection of Persons and Property.

1. Operate warning lights as recommended by authorities have jurisdiction.

2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3. No excavations will be left open overnight, or while work is not in progress.

1.05 TRENCH BACKFILL MATERIALS

A. **Suitable Fill.** Materials are defined as those complying with ASTM D287 soil classification groups GW, GP, GM, SM, SW, and SP.

B. **Unsuitable Fill.** Materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.

C. **Stone Refill.** PDT 2A Modified (2RC) Stone

1.06 LIMITS OF EXCAVATION

A. General. Trenches for pipes shall be excavated a minimum of 24" wide. Before excavation is started in either bituminous or concrete paved streets, the paving shall be cut by either jack hammer, or diamond saw.

B. Where the trench excavation for pipe is in rock, the trench bottom shall be undercut a minimum of 6 inches below the final location of the pipe and 2A modified shall be placed in the bottom of trench.

1.07 LENGTH OF TRENCH OPENING

A. In excavating for pipelines, the excavation shall at all times be finished to the required grade for an adequate distance in advance of the completed pipeline. Unless otherwise permitted by CONSTRUCTION MANAGER, not more than 50 feet of trench shall be open at one time in advance of the pipe. The length of street which may be occupied by the construction work at any one time will be based on the requirements of use of the street by the public. No more than 600 consecutive feet of length of the street shall be occupied at one time, and vehicle traffic through the street shall not be entirely stopped without the permission of CONSTRUCTION MANAGER.

1.08 METHODS OF EXCAVATION

A. All excavation shall be open cut from the surface. Excavation will be a minimum of five feet (5') deep, unless more depth is required in specific area for site specific conditions (i.e. going under another utility.)

1.09 STABILITY OF EXCAVATIONS

A. General. All excavations will provide four feet (4') of cover over the water main. The contractor will provide a safe, stable ditch for pipe installation. All trenching will be in compliance with OSHA trenching standards.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

1.10 BACKFILLING TRENCHES

A. All trenches in paved streets, road shoulder within three feet (3') of cartway, traveled roadways, parking areas and driveways shall be backfilled with 2A modified. 2A modified fill shall be placed in not more than eighteen inch (18") lifts and thoroughly and uniformly compacted by machine tamping.

B. Machine tamping will be done with a minimum 17,000 lb. excavator, mounded vitratory plate. Care will be taken not to vibrate the spigot out of the bell. The ditch will be filed and compacted to 2" below finish grade. Large rocks will not be left at the surface.

C. Trenches more than three feet (3') away from blacktop, shall be backfilled in eighteen inch (18") lifts, from top of the pipe to the ground surface with job-excavated, suitable backfill and tamped as required to prevent trench settlement.

D. Any depression resulting from settlement of the trench backfill previous to the date of total acceptance of all Work under this Contract shall be brought to proper grade and surface, and made to match the adjacent surface. No additional compensation will be awarded for re-work.

1.11 CROSSING EXISTING STRUCTURES

A. During construction, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits, and other underground structures. Every effort shall be made to prevent damage to such underground structures. Wherever such structures are disturbed or broken, they shall be restored to original condition by CONTRACTOR.

1.12 METHOD OF EXCAVATION IN ROCK

A. This job is bid without a rock classification. Any rock encountered will be the responsibility of the Contractor to excavate, with no provisions for extra payment. Pipe in areas where rock is encountered will be bedded with 2A modified.

1.13 BACKFILLING ROCK EXCAVATION AREAS

A. All trench areas in which rock excavation is made shall be backfilled with suitable fill.

1.14 COMPACTION

A. Percentage of Maximum Density Requirements. Compact soil to not less than the following percentages of maximum density, in accordance with ASTM D1557:

1. Under pavements, compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent maximum unit weight.

2. Under lawn or unpaved areas, compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent maximum unit weight.

B. Moisture Control. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations. No additional compensation.

1. Remove and replace, soil material that is too wet to permit compaction to specified density.

1.15 DISPOSAL OF EXCAVATED MATERIAL

A. Excavated material, where suitable, shall be used in backfilling around pipelines and structures. All material in excess of the quantity required for backfilling or unsuitable material shall be disposed of by CONTRACTOR. CONTRACTOR shall obtain such spoil sites as may be required. CONTRACTOR shall implement sediment and erosion control measures as necessary at spoil site.

1.16 ROADSIDE DITCHES AND CULVERTS

A. All roadside ditches and driveway culverts shall be cleaned, repaired and replaced to the same condition, or better, as existed before trenching operations commenced. Repair and/or replacement costs shall be included in other portions of the Work unless otherwise noted on the Drawings.

1.17 REGRADING

A. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

C. Settling. Where settling is measurable or observable at excavated areas during general Project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

SECTION 02211
BLACKTOP RESTORATION

1.01 GENERAL

A. Section includes: The work includes all asphalt restoration throughout specified project. All state roadways, ownership roadways, driveways and parking lots that are excavated during the project will be restored.

1.02 REQUIREMENTS INCLUDE

A. Material Thickness Specifications

B. Barricades, Lights and Signs

C. Bituminous Concrete Base With Bituminous Top

D. Joint Sealing Coat

E. Re-cutting Bituminous Paving Edge

1.03 MATERIAL THICKNESS SPECIFIED

A. All thickness specified for concrete and bituminous materials are to be the measured compacted finish thickness.

1.04 BARRICADES, LIGHTS AND SIGNS

A. It shall be the responsibility of the CONTRACTOR to provide all necessary construction signs, barricades and lights to provide adequate protection of the construction area.

1.05 BITUMINOUS CONCRETE BASE WITH BITUMINOUS TOP

A. All bituminous concrete base with bituminous wearing surface shall be done in accordance with the applicable NPWA specifications and/or Pennsylvania Department of Transportation specifications Form 408. (See attached drawing for NPWA specifications.)

1.06 JOINT SEALING COAT

A. All joints of new and old bituminous paving shall be sealed with BM-1 asphalt. All unit prices for bituminous work shall include joint sealing coat required to obtain a completed patch.

1.07 RE-CUTTING BITUMINOUS PAVING EDGES

A. All existing edges of bituminous paving shall be cut square and straight before any re-paving work is done.

1.08 DRIVEWAY RESTORATION

A. All driveways damaged due to construction activities shall be restored to their original or better conditions as established by the pre-construction audiovisual tape coverage. Any charges to the original driveway layout or materials shall be allowed only if CONTRACTOR receives written consent from the property owner. Care will be exercised by CONTRACTOR to minimize driveway damage when truck and equipment crosses driveway. Rubber mats or plywood will be laid under tracks.

END OF SECTION

SECTION 02660
WATER DISTRIBUTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: The principal buried pipelines and their locations to be included under this heading, together with the pipe material required in each case, are shown on the Drawings.

B. Plugs in open ends of pipe, temporary bulkheads, protection of surface and subsurface improvements, cleaning, pointing, testing and disinfecting, as required, shall be included in the unit prices for the type, size and class of water main listed in the Bid Form, and as part of this Work.

1.02 RELATED WORK

A. Section 02210 - Excavation and Backfill of Water Main

1.03 REFERENCES

A. Reference Standards. Reference standards are under the individual items of Work.

1.04 SUBMITTALS

A. Shop Drawings. Furnish, as prescribed under Section 01300, Submittals, shop drawings covering the items included under this Section of the Contract.

B. As-constructed Drawings. CONTRACTOR shall submit one complete set of drawings showing the location of pipe valves, fire hydrants and fittings as installed. The location of all valve boxes shall be witnessed to at least two permanent reference points such as utility poles, building, *etc.* Other valve boxes shall not be used as reference points.

C. Warranty. Furnish, as prescribed under the General Conditions, warranties covering the items included under this Section of the Work.

1.05 QUALITY ASSURANCE

A. All Work under this Section shall be done in accordance with standard practices as recommended by the manufacturer and AWWA.

PART 2 PRODUCTS

2.01 MATERIALS

A. Corporation stops, curb stops, and curb boxes shall be Mueller Company products. All corporation stops, curb stops, and curb boxes shall be provided and installed by the CONTRACTOR.

1. Service line trenches shall be backfilled with 2A Modified material in blacktop areas.

B. Piping shall be of the types listed below:

1. Ductile Iron Pipe and Fittings shall be either U.S. Pipe or Griffin Pipe Products Company.

2. Ductile Iron Pipe shall be manufactured in accordance with ANSI A21.51 (AWWA C151) American Standard for ductile iron pipe.

3. Pipe shall be Class 52 thickness in accordance with ANSI A21.51 (AWWA C151).

4. All ductile iron pipe and fittings shall be cement lined and coated outside with a bituminous seal coat in accordance with ANSI A21.4 (AWWA C104)

5. The fittings shall be mechanical joint fitting and shall conform to ANSI A21.10 (AWWA C110 and ANSI A21.11 (AWWA C111) except where detailed otherwise on the drawings.

C. Valves and Valve Boxes

1. All 6" and 8" gate valves shall be either:

a. Mueller Super Seal #A-2360-20LN Gate Valve. Manufactured Mueller Co., Decatur, Illinois.

b. Metro Seal 250 resilient seated gate valve manufactured by U.S. Pipe and Foundry Co., Birmingham, Al.

2. Butterfly valves shall be used for all 12" or larger installations and shall be:

a. Mueller Lien Seal III Butterfly Valve No. B-3211-20. Manufactured by Henry Pratt Co.

4. Valves shall be mounted vertically, except if otherwise noted on the Drawings and shall have mechanical joint ends.

5. All valves shall open by turning clockwise and shall have a standard 2" operating nut.

6. All buried valves shall be furnished with a cast-iron valve box. All valve boxes shall be either:

   a. Buffalo Type - Two (2) piece screw Type 5 - ¼ " shaft

   b. Tyler Series 6850, Manufactured by Tyler Pipe Company

7. Valve boxes shall be two-piece, screw-type installed over the bonnet and operating nut. Valve boxes shall be of sufficient length to reach the surface of the ground, but not extend above the ground surface.

D. Fire Hydrants

1. All fire hydrants shall be either:

   a. Mueller Centurion 5 ¼" Fire Hydrant AWWA Type Fire Hydrant manufactured by Mueller Co., Decatur, Illinois.

   b. Kennedy K-810, 5 ¼" fire Hydrant AWWA Type Fire Hydrant manufactured by Kennedy Valve, Elmira, New York.

2. All Fire Hydrants shall have:

   a. 6 inch mechanical joint inlet connection

   b. One (1) 4 ½ inch steamer nozzle

   c. Two (2) 2 ½ inch hose nozzle

   d. Open left hydrant operating and nozzle cap nuts: Fire Hydrant steamer and hose threads to be national standard.

PART 3 EXECUTION

3.01 INSTALLATION

A. Disinfectant tablets shall be attached with adhesive to the inside of each piece of installed pipe. Disinfectant shall be 5 gram hypo-chlorite ($Ca(OCl)_2$) tablets which conform to NSI/AWWA B300. Tablets shall contain approximately 65 percent available chlorine by weight and be installed according to the following schedule:

Diameter of Pipe (inches)	2	3	4	6	8	10	12	16
Number of Tablets per Pipe	1	1	1	1	2	3	4	6

B. Service Connections shall be as noted on the Drawings, but shall be no smaller than ¾- inch in diameter. The underground service connection shall extend from the main to the edge of the public right-of-way, utility pole or curb line.

C. Service connections shall be installed only after the PIPE CLEANING AND TESTING (Section 3.02) requirements are met.

D. Corporation Stops shall be the same size as the service connection and shall be installed per AWWA standards.

3.02 PIPE CLEANING AND TESTING

A. All piping shall be thoroughly cleaned and flushed prior to use. Water main shall be flushed only after 24 hour containment of fresh water.

B. Piping shall be subjected to a pressure test performed by the contractor and witnessed by CONSTRUCTION MANAGER. Piping shall remain leak-free during and after being subjected to a minimum pressure of 150 psi for four (4) hours. All leaks shall be the CONTRACTOR's responsibility to pinpoint and repair.

C. Piping shall be subjected to a bacterial test performed by CONTRACTOR after the lines have been flushed with residual chlorine concentrations of 1 ppm or less.

3.03 FIELD QUALITY CONTROL

A. CONSTRUCTION MANAGER shall determine acceptable work and review all material submittals.

END OF SECTION

SECTION 02910
LANDSCAPE RESTORATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Providing all materials and labor required to restore those areas affected by construction activities, both within and outside of construction limits, back to their original conditions or better as established by pre-construction audiovisual tape coverage and other documented sources. All landscaped restoration work will be completed by CONTRACTOR, and will be warranted for one year after final approval.

1.02 RELATED REQUIREMENTS

A. Section 01310 - Audiovisual Tape Coverage

B. Section 02210 - Excavation and Backfill of Water Main

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Any topsoil necessary to complete the work over and above the topsoil stockpiled during construction shall be furnished by the CONTRACTOR. All topsoil shall conform to the following :

1. Topsoil shall be free from brush, objectionable weeds, litter, and other debris, and be approved by the CONSTRUCTION MANAGER prior to spreading.

B. Seed: All seed to be used shall be labeled in accordance with the U.S. Department of Agriculture Rules and Regulations and shall meet the following classifications:

Seed Type	Percent of Mixture
Perennial Rye (blend of three rated top ten NTEP*)	80%
Kentucky Blue	20%

*National Turf Grass Evaluation Program

PART 3 EXECUTION

3.01 GENERAL

A. All areas affected by construction activities shall be restored to their original or better conditions within 30 calendar days of date of water line installation by CONTRACTOR. For purposes of this section, landscaping shall include, but not be limited to, the following items: Grass, shrubbery, flower beds, gardens, fencing,

mailboxes, driveways, curbs, sidewalks, ditches, and all decorative items on homeowners' property affected by construction activities.

B. All work shall be subject to inspection by CONSTRUCTION MANAGER to ensure that proper and complete landscape restoration has occurred in all locations affected by construction activities.

3.02 TOPSOIL PREPARATION AND SEED INSTALLATION

A. Fine grade topsoil, eliminating uneven areas and low spots. Make changes in grade gradual, and round slopes with a minimum four (4) foot radius.

B. Clear area of stones, roots, and other foreign materials.

C. Loosen and break large clumps of earth to a depth of three (3) to four (4) inches.

D. Seed shall be spread uniformly at the rate of 15 pounds (lb) per acre (ac.).

E. Fertilizer shall be applied at the rate of:

Nutrient	Rate
N	50 lb/ac.
P_2O_5	50 lb/ac.
K_2O	50 lb/ac.

F. Clean straw shall be uniformly spread at the rate of 3 tons per acre.

G. On slopes prone to erosion, future matting shall be used to hold seed in place.

3.03 TREE, SHRUBBERY, AND OTHER VEGETATION RESTORATION

A. All damaged and unrooted vegetation shall be replaced in kind, with the largest available specimen. Replacement with a dissimilar species shall only be allowed if CONTRACTOR receives written consent from the property owner.

B. All replacement vegetation shall have normal healthy root systems and be sound, vigorous, and free from disease, insects, and other nuisances.

C. All trees and shrubs shall be balled, burlapped, and be planted within a cavity of sufficient diameter and depth to encompass the entire root system.

D. All new vegetation shall be maintained immediately after placement until final acceptance or until it is well established and exhibits a vigorous growing condition. All dead and injured twigs and branches shall be removed by using proper pruning techniques.

3.04 DRIVEWAY RESTORATION

A. All driveways damaged due to construction activities shall be restored to their original or better conditions as established by the pre-construction audiovisual tape coverage. Any changes to the original driveway layout or materials shall be allowed only if CONTRACTOR receives written consent from the property owner.

3.05 MISCELLANEOUS RESTORATION

A. All fencing, mailboxes, and other decorative items removed or damaged due to construction activities shall be repositioned and/or replaced with items of identical size, shape and materials. Variations from original conditions shall be allowed only if CONTRACTOR receives written consent from the property owner.

END OF SECTION

EXHIBIT 3

CONSTRUCTION DRAWINGS

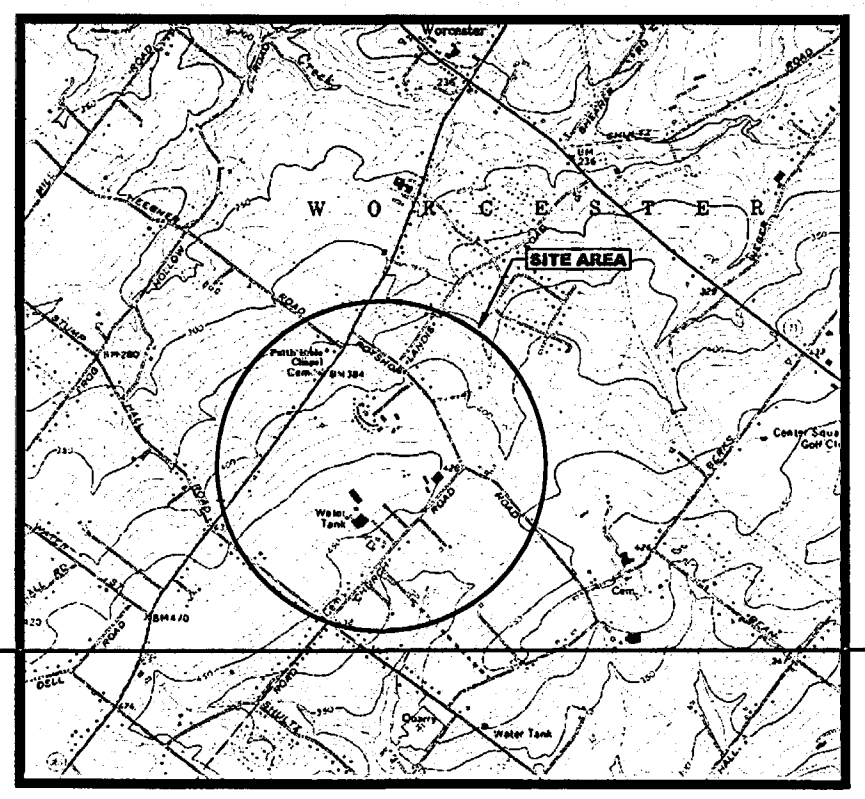
NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP

PREPARED FOR: SCHLUMBERGER RESOURCE MANAGEMENT SERVICES INC. (SCHLUMBERGER INDUSTRIES, INC)

PREPARED BY: RMT INC. AND NORTH PENN WATER AUTHORITY

DATE: MARCH 1999

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL E. OMAN
ENGINEER
NO. 42826
3/2/99



SITE LOCATION MAP

BASE MAP DEVELOPED FROM THE LANSDALE, PENNSYLVANIA 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP, DATED 1958, PHOTOREVISED 1988.

LANSDALE, PENNSYLVANIA

DRAWING INDEX

SHEET NUMBER	SHEET TITLE
1	TITLE SHEET / DRAWING INDEX
2	CREST TERRACE & HICKORY RIDGE ROAD
3	STUMP HALL ROAD
4	TOWNSHIP LINE ROAD
5	TROOPER ROAD
6	POTSHOP ROAD
7	HEEBNER AND SHEFLEY ROADS
8	LANDIS ROAD
9	VALLEY FORGE ROAD
10	DETAILS

02-15-1999	US EPA SUBMITTAL
03-02-1999	US EPA SUBMITTAL

NOTE: THESE PLANS ARE ACCOMPANIED BY A REPORT OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND INTENDED TO BE USED AND REVIEWED TOGETHER.

RMT INC., MICHIGAN
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ANN ARBOR, MI 48108-2227
P.O. BOX 991 48106-0991
PHONE: 734-971-7080

AR002914

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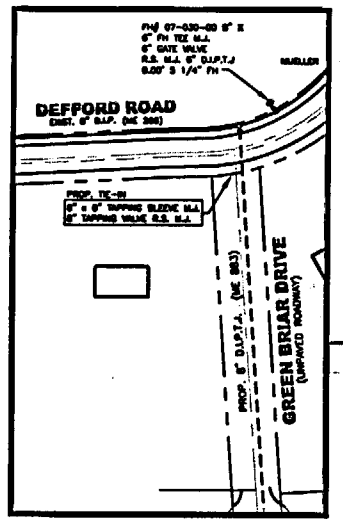

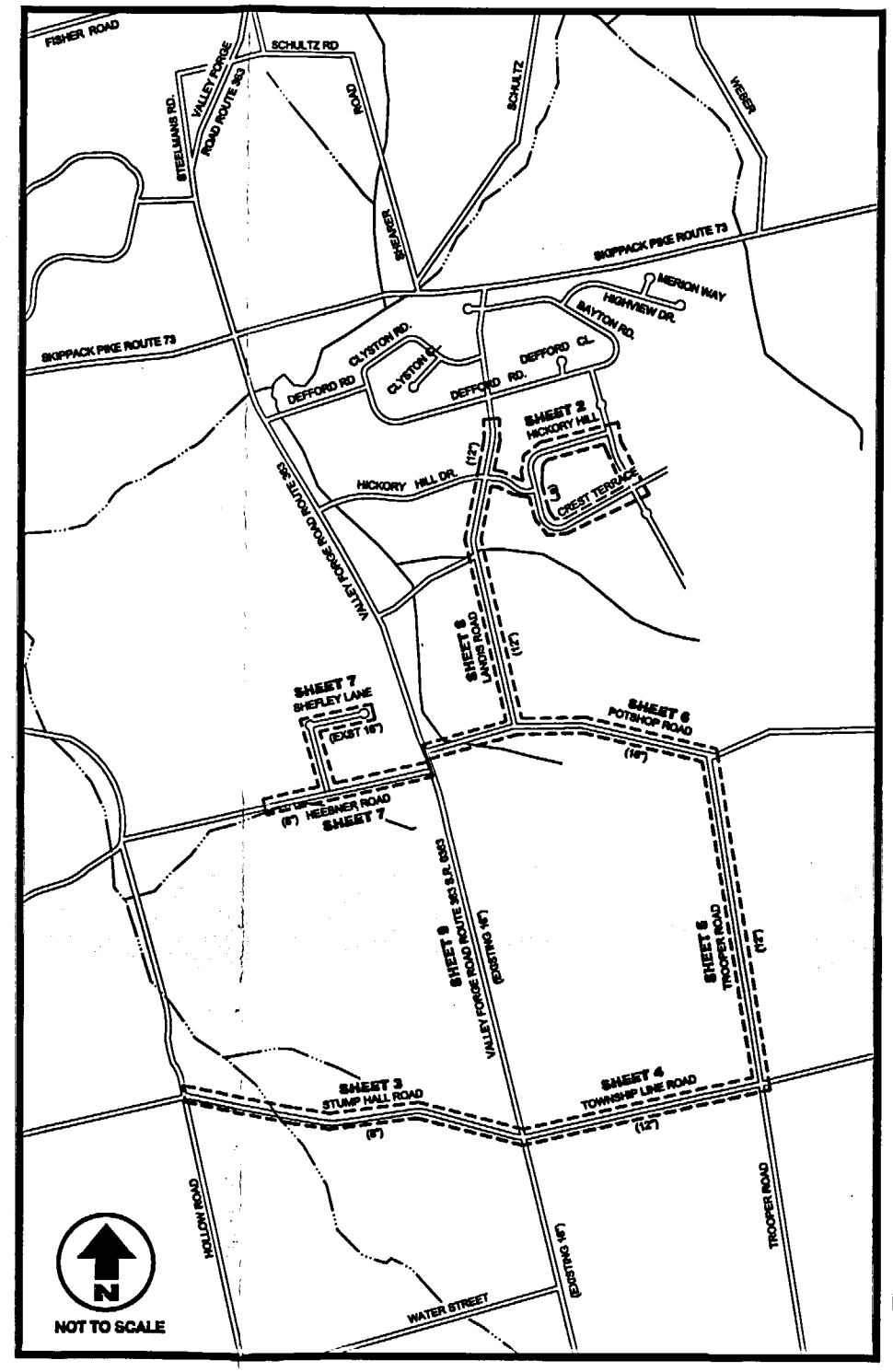

ABBREVIATIONS

MJ	MECHANICAL JOINT
FH	FIRE HYDRANT
RS	RISING STEM
DIPTJ	DUCTILE IRON PIPE NYLON JOINT
MAC	MACADAM
PROP	PROPOSED
CSP	CORRUGATED METAL PIPE
DIP	DUCTILE IRON PIPE
CONC	CONCRETE
ST	STREET
EXIST	EXISTING

NPWA KEY

S+0	STATIONS
■	SEWER INLET
◉	MANHOLE
○	POLE
•	LIGHT
⋈	GAS VALVE
⊕	WATER VALVE
⋈	METER PIT W/SHUT OFF VALVE

NPWA LEGEND

CENTER LINE
RIGHT OF WAY
EDGE OF ROAD
CURB
PROPERTY LINE
SIDEWALK
FENCE
STORM SEWER
SANITARY SEWER
GAS MAIN
ELECTRIC LINES
WATER MAIN
NEW WATER MAIN, MSH 999

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1.	SJL	02-15-99	USEPA SUBMITTAL	ELC

NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

CREST TERRACE AND HICKORY HILL ROAD

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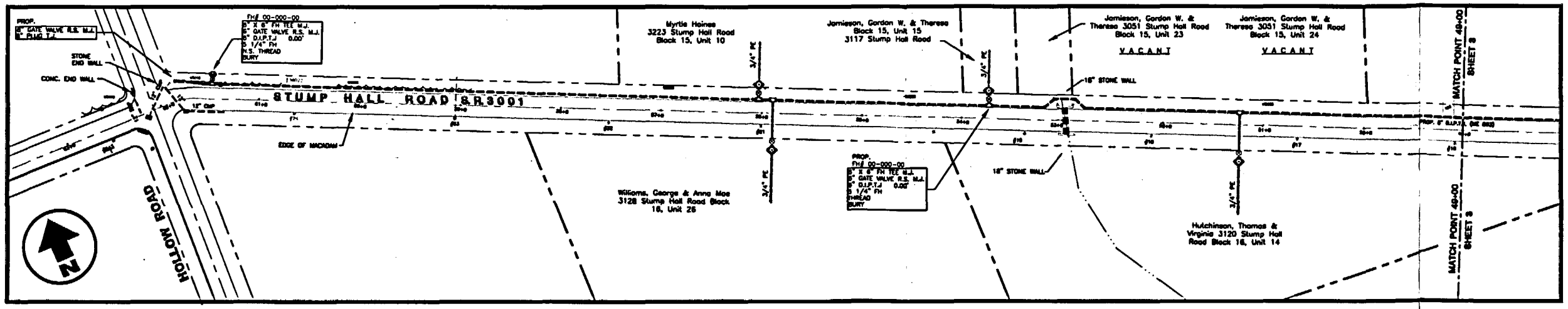

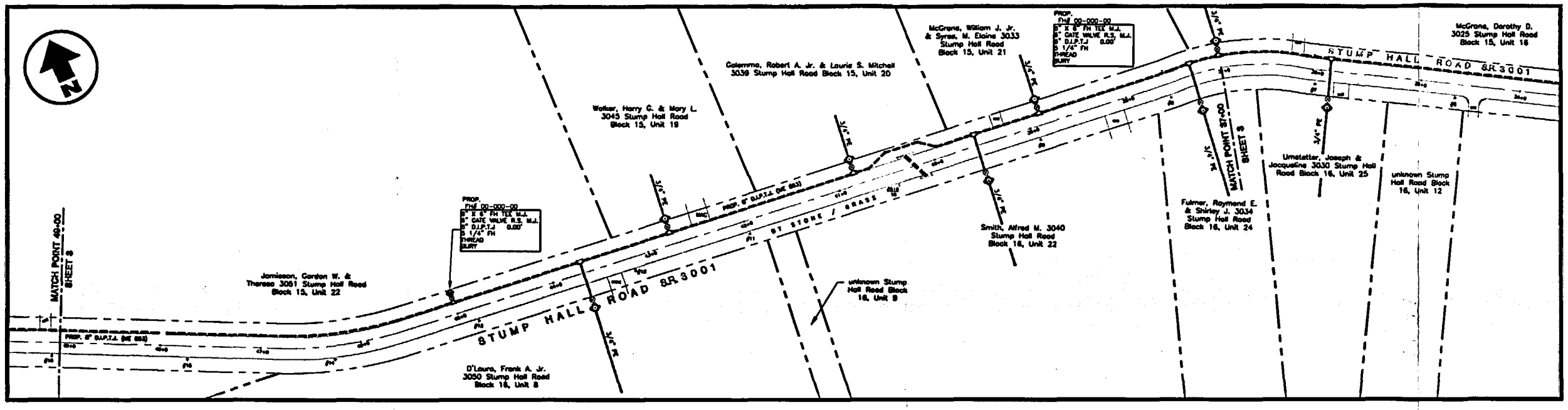

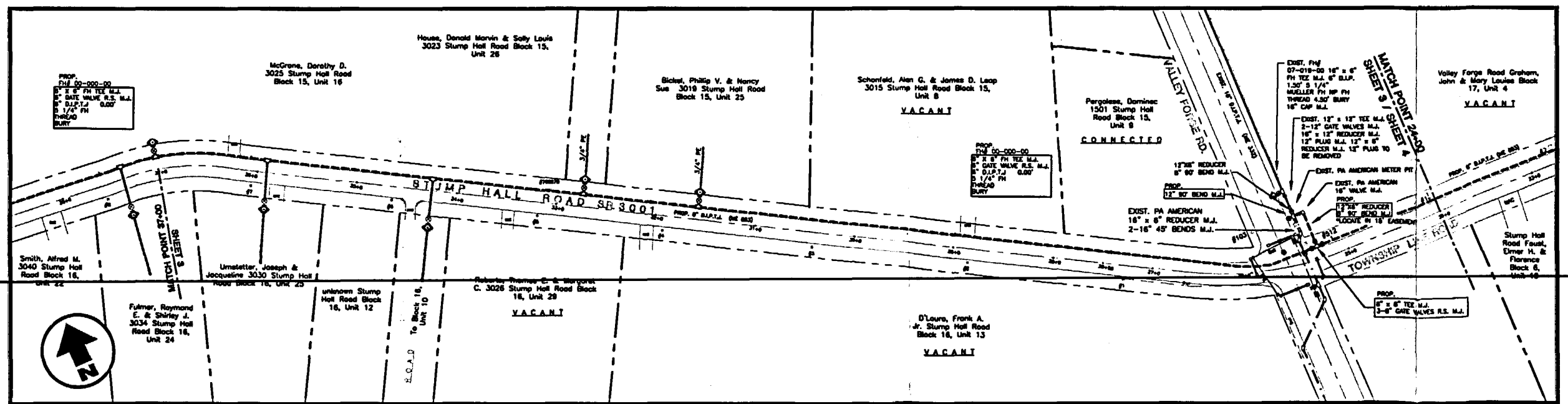

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NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

STUMP HALL ROAD

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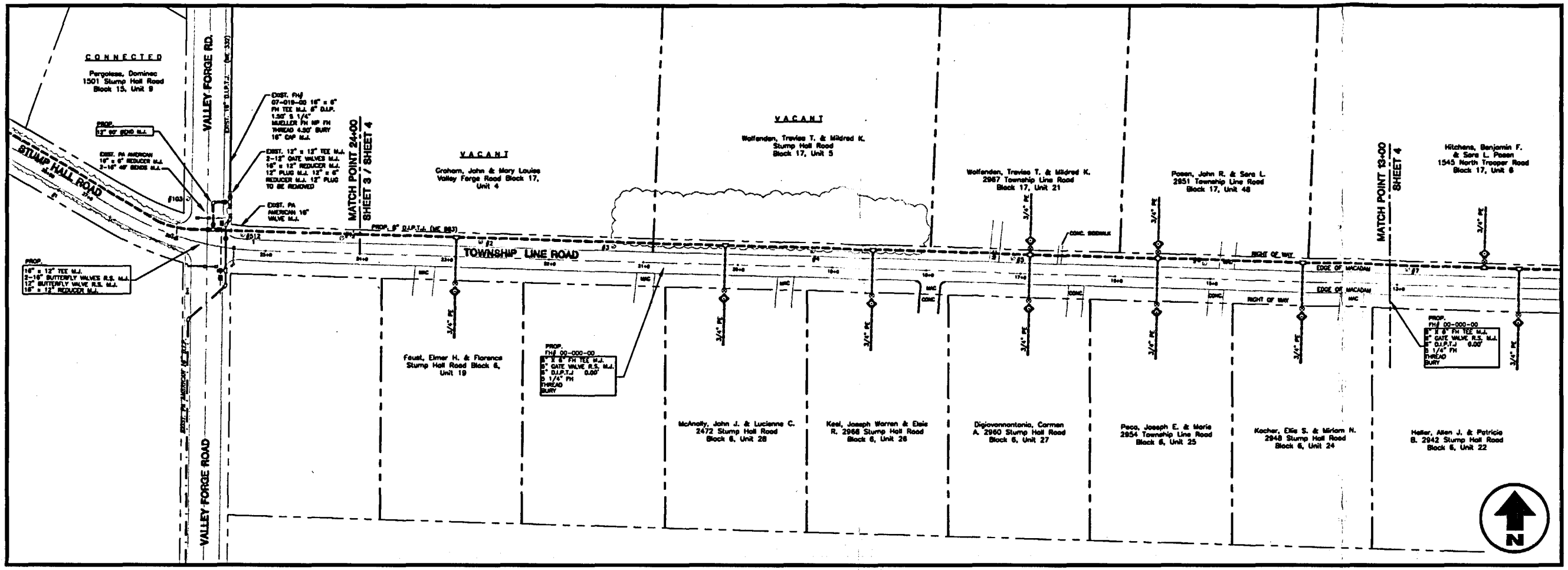

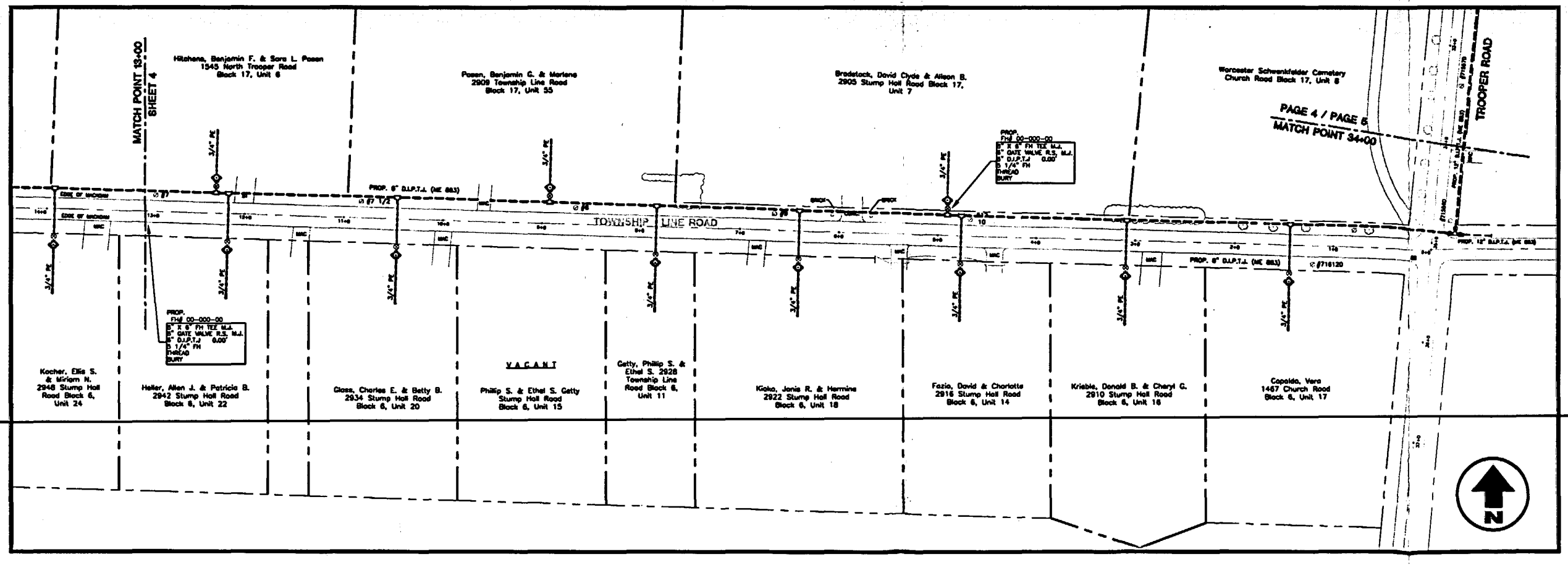

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NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

TOWNSHIP LINE ROAD

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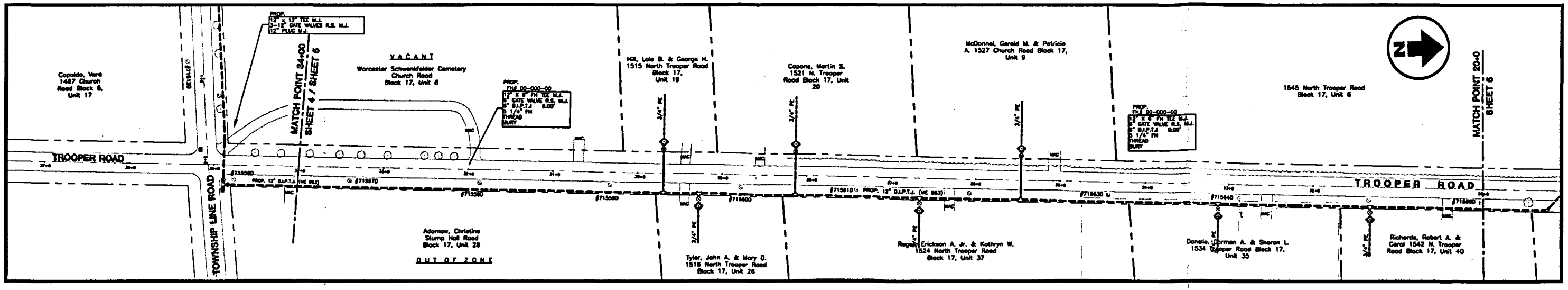

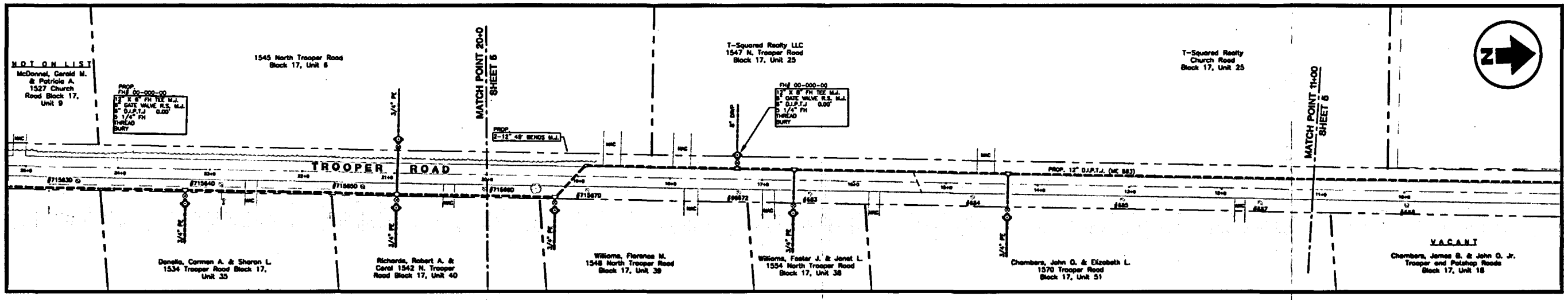

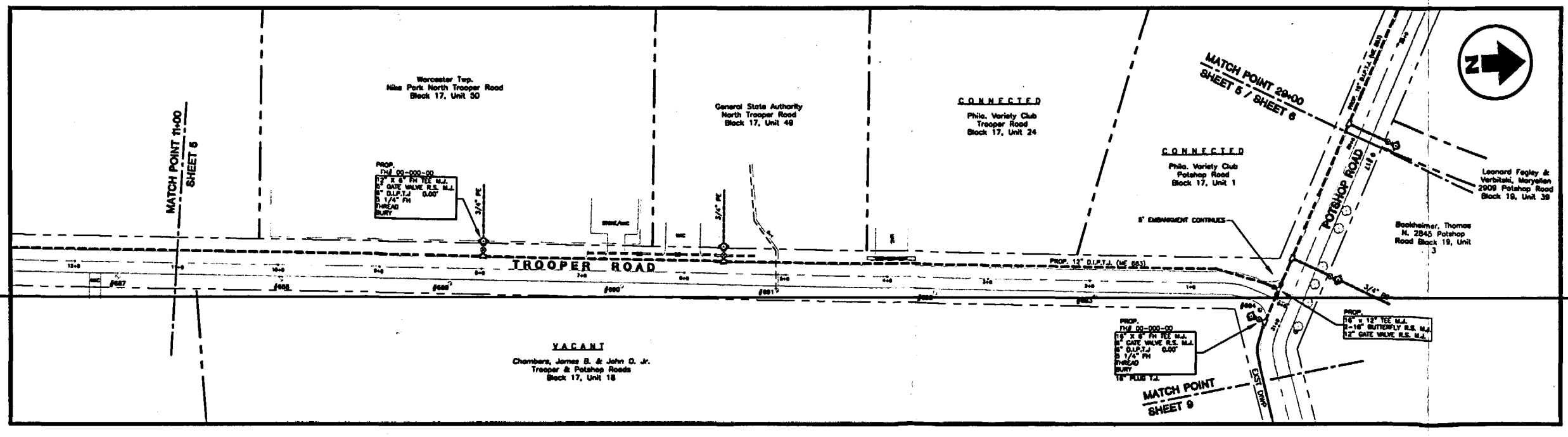

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NORTH PENN AREA 12
~~WATER MAIN EXTENSION~~
WORCESTER TOWNSHIP, PENNSYLVANIA

TROOPER ROAD

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NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

POTSHOP ROAD

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2.	S.K.	03-02-99	USEPA SUBMITTAL	D.C.
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DATE: MARCH 1999 | Sheet 6 of 10

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SHEET 8

POTSHOP ROAD

LANDIS ROAD

HEEBNER RD

VALLEY FORGE ROAD S.R.0363

CONNECTED

VACANT

Leonard Feasy & Barbara, Morgenstern
2908 Pottstop Road
Block 18, Unit 38

Conroy, Dennis H. & Lorna L.
2815 Pottstop Road Block
18, Unit 37

Conroy, Dennis H. & Lorna L.
2813 Pottstop Road Block
18, Unit 37

Lawrence, Bruce L.
& Linda K.
Pottstop Road
Block 18,
Unit 38

McCarthy, John J. III & Diane P.
2841 Pottstop Road
Block 18, Unit 19

Lawrence, Richard J. & Patricia A.
2847 Pottstop Road
Block 18, Unit 22

Phila. Variety Club
Pottstop Road
Block 17, Unit 22

Phila. Variety Club
Pottstop Road
Block 17, Unit 23

Severson Bank 3001
Heebner Road Block 14A,
Unit 1 Acres #
1-26-02000-07

1607 Valley
Forge Road
Block 14A
Unit 13

Lawrence & Mary Ellen Casey
2965 Pottstop Road
Block 14A, Unit 29

Massaniello Construction Company
2961 Pottstop Road
Block 14A, Unit 30

Somervel, Joseph A.
& Edward F. Dougherty
2971 Pottstop Road
Block 14A, Unit 28

Somervel, Joseph A.
& Edward F. Dougherty
2973 Pottstop Road
Block 14A, Unit 27

Rowe, Mahn M. & Carl K.
2916 Pottstop Road Block
18, Unit 16

Rusa, John W.
2933 Pottstop Road
Block 18, Unit 18

Lenondowski,
Ralph J. &
Veronica M. 2947
Pottstop Road
Block 18, Unit 22

Bertolin, Robert D. & Denise L.
2833 Pottstop Road Block 18,
Unit 4

Phila. Variety Club
Pottstop Road
Block 17, Unit 1

RMT COMPUTER AIDED DESIGN AND DRAFTING

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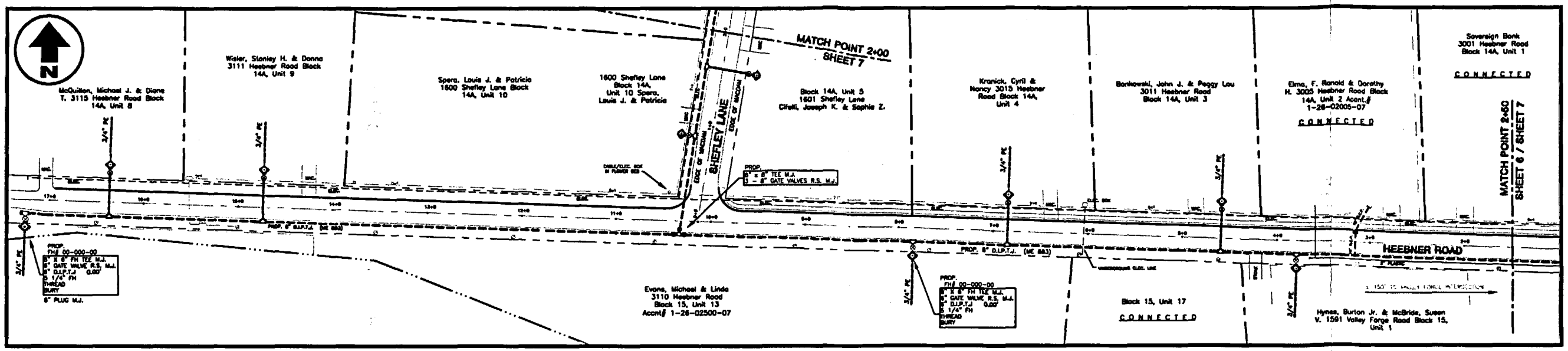

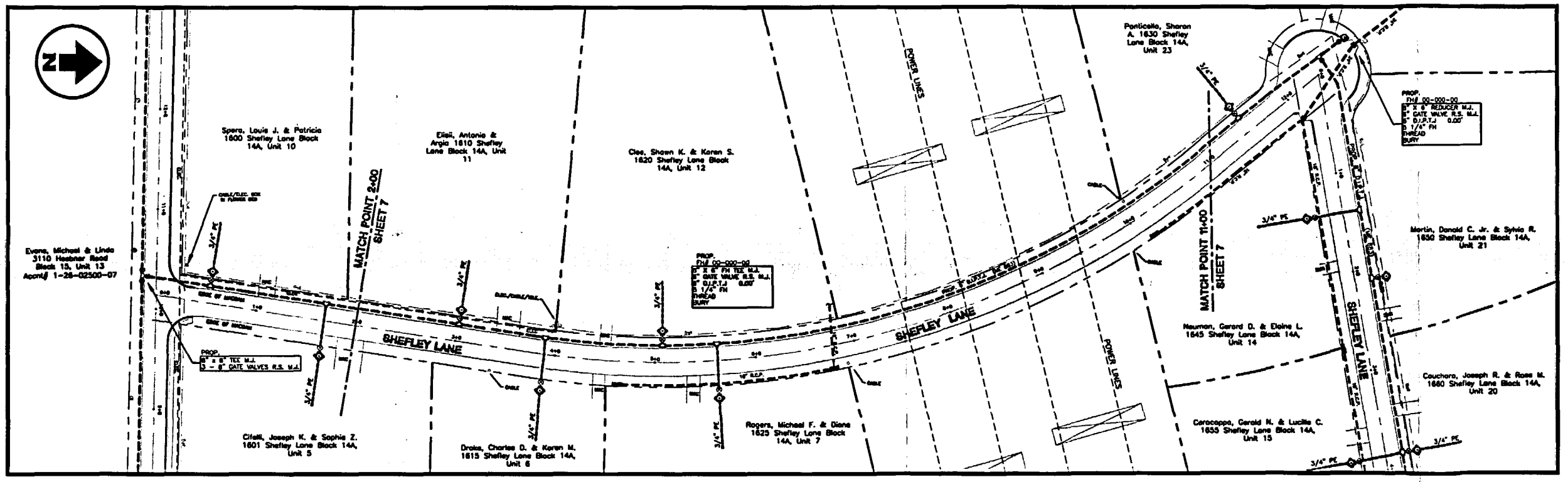

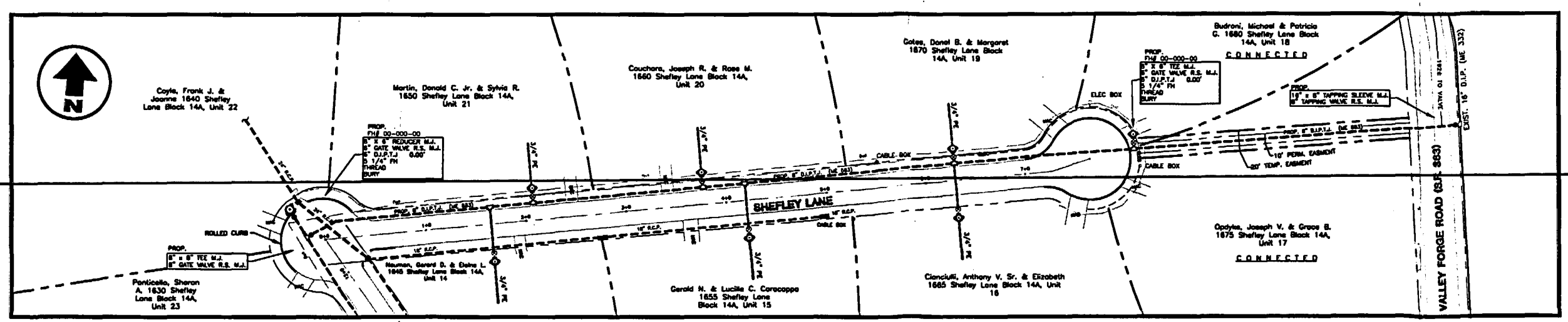

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1.	SJL	02-15-99	USEPA SUBMITTAL	ELC

NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

HEEBNER AND SHEFLEY ROADS

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PHONE: 313-971-7080
FAX: 313-971-9022

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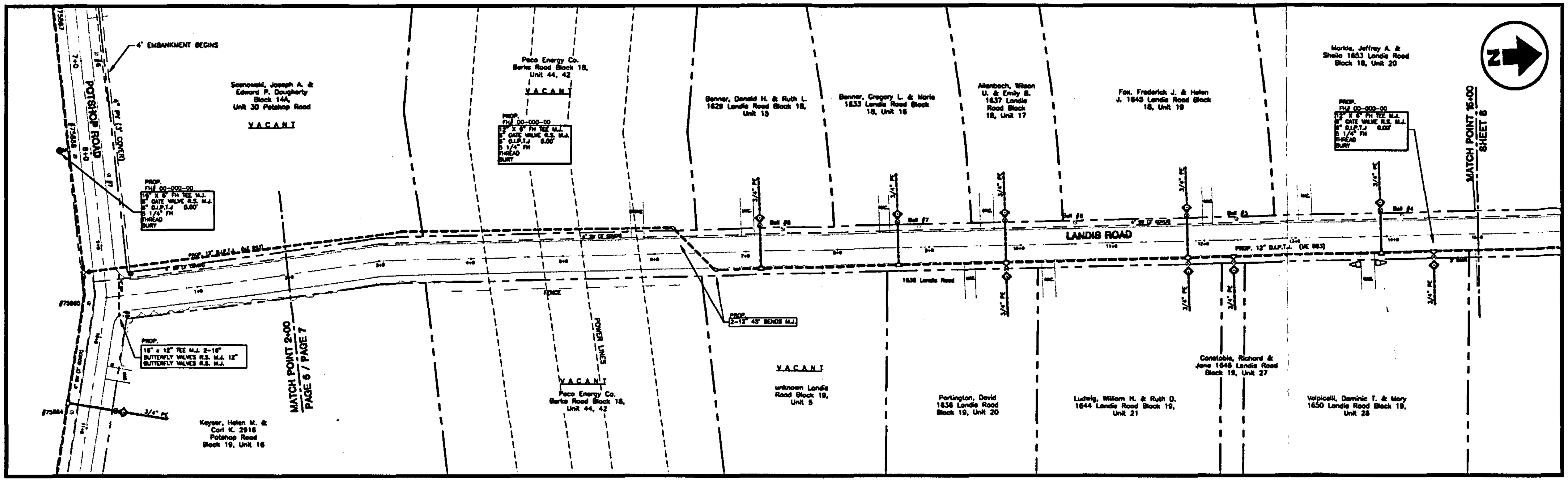

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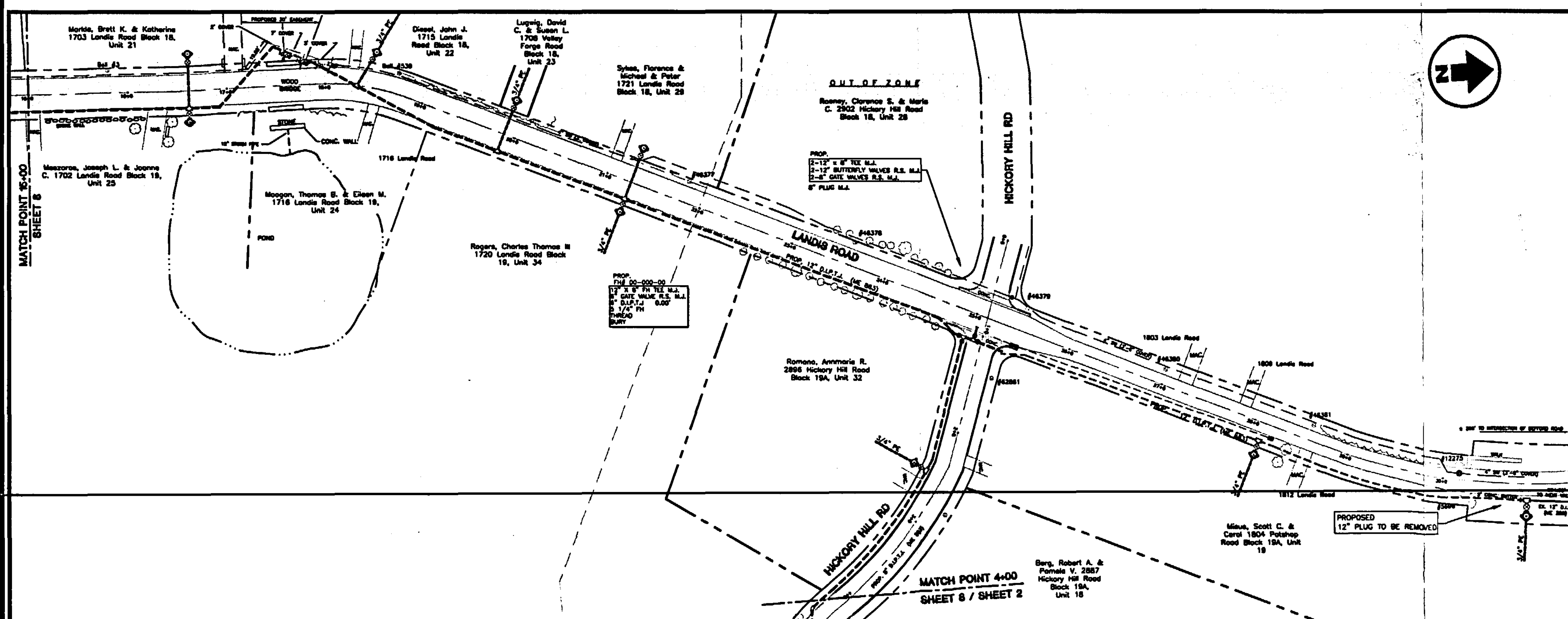
SHEET 8
POTSHOP ROAD
LANDIS ROAD
4" EMBANKMENT BEGINS
VACANT
POWER LINES
FENCE
PROP. 2-12" 45° BENDS M.J.
PROP. 16" x 12" TEE M.J. 2-16" BUTTERFLY VALVES R.S. M.J. 12" BUTTERFLY VALVES R.S. M.J.
Sosnowski, Joseph A. & Edward P. Dougherty Block 14A, Unit 30 Potshop Road
Peco Energy Co. Berks Road Block 18, Unit 44, 42
Benner, Donald H. & Ruth L. 1629 Landis Road Block 18, Unit 15
Benner, Gregory L. & Marie 1633 Landis Road Block 18, Unit 16
Allenbach, Wilson U. & Emily B. 1637 Landis Road Block 18, Unit 17
Fox, Frederick J. & Helen J. 1645 Landis Road Block 18, Unit 19
Markle, Jeffrey A. & Sheila 1653 Landis Road Block 18, Unit 20
Keyser, Helen M. & Carl K. 2916 Potshop Road Block 19, Unit 16
unknown Landis Road Block 19, Unit 5
Perlington, David 1636 Landis Road Block 19, Unit 20
Ludwig, William H. & Ruth D. 1644 Landis Road Block 19, Unit 21
Constable, Richard & Jane 1648 Landis Road Block 19, Unit 27
Volpicelli, Dominic T. & Mary 1650 Landis Road Block 19, Unit 28



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SHEET 8 / SHEET 2
LANDIS ROAD
HICKORY HILL RD
OUT OF ZONE
POND
STONE
CONC. WALL
PROPOSED 12" PLUG TO BE REMOVED
PROP. 2-12" x 8" TEE M.J. 2-12" BUTTERFLY VALVES R.S. M.J. 2-8" GATE VALVES R.S. M.J. 8" PLUG M.J.
Markle, Brett K. & Katherine 1703 Landis Road Block 18, Unit 21
Meszaros, Joseph L. & Joanne C. 1702 Landis Road Block 19, Unit 25
Moogan, Thomas B. & Eileen M. 1716 Landis Road Block 19, Unit 24
Diesel, John J. 1715 Landis Road Block 18, Unit 22
Ludwig, David C. & Susan L. 1708 Valley Forge Road Block 18, Unit 23
Sykes, Florence & Michael & Peter 1721 Landis Road Block 18, Unit 29
Rogers, Charles Thomas III 1720 Landis Road Block 19, Unit 34
Rooney, Clarence S. & Marie C. 2902 Hickory Hill Road Block 18, Unit 28
Romano, Annmarie R. 2896 Hickory Hill Road Block 19A, Unit 32
Berg, Robert A. & Pamela V. 2887 Hickory Hill Road Block 19A, Unit 18
Maue, Scott C. & Carol 1804 Potshop Road Block 19A, Unit 19
1716 Landis Road
1803 Landis Road
1808 Landis Road
1812 Landis Road

0 60' 120' 240' 320'

SCALE IN FEET

NO.	BY	DATE	REVISION	APP'D.
5.				
4.				
3.				
2.	SJL	03-02-99	USEPA SUBMITTAL	ELC
1.	SJL	02-15-99	USEPA SUBMITTAL	ELC

NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

LANDIS ROAD

DRAWN BY: SJL	SCALE: SHOWN	PROJECT NO. 70924.01
CHECKED BY: ELC		FILE NO. 0217.DWG
APPROVED BY: ELC	DATE PRINTED:	SHEET 8 of 10
DATE: MARCH 1999		

RMT INC.
1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
P.O. BOX 991 48106-0991
PHONE: 313-971-7080
FAX: 313-971-9022

BMT COMPUTER AIDED DESIGN AND DRAFTING

Frank A. D'Laura
1415 Valley Forge Road
Block 16, Unit 7

VACANT
UNKNOWN
Block 16, Unit 13

CONNECTED
Pergolese, Dominec
1501 Stump Hall Road
Block 15, Unit 9

CONNECTED
UNKNOWN
Block 15, Unit 8

EXIST. PA AMERICAN
16" x 6" REDUCER M.J.
2-16" 45° BENDS M.J.

EXIST. PA AMERICAN 16" D.I.P.

EXIST. 16" D.I.P.T.J. (ME 332)

EXISTING 15' PERM. EASEMENT

PROP.
6" x 6" TEE M.J.
3-6" GATE VALVES R.S. M.J.

PROP.
12"x8" REDUCER
8" 90° BEND M.J.
*LOCATE IN 15' EASEMENT

EXIST. PA AMERICAN
METER PIT

EXIST. PA AMERICAN
16" VALVE M.J.
*12" PLUG TO BE REMOVED
*TEE AND VALVE TO BE ROTATED

EXIST.
12" x 12" TEE M.J.
2-12" GATE VALVES M.J.
16" x 12" REDUCER M.J.
12" PLUG M.J.
12" x 6" REDUCER M.J.

EXIST.
FH# 07-018-00
16" x 6" FH TEE M.J.
6" D.I.P. 1.50'
5 1/4" MUELLER FH
NP FH THREAD
4.50' BURY
16" CAP M.J.

MATCH POINT 24+00
SHEET 3

John & Mary Louise Graham
1515 Valley Forge Road
Block 17, Unit 4

VACANT
John & Mary Louise Graham
1515 Valley Forge Road
Block 17, Unit 4

John & Mary Louise Graham
1515 Valley Forge Road
Block 17, Unit 4

VALLEY FORGE ROAD

3/4" PK

Cuilo & Marionnina Fierro
1520 Valley Forge Road
Block 17, Unit 46

Robert E. & Mary A. Brown
1526 Valley Forge Road
Block 17, Unit 52

Mary Wallace
1530 Valley Forge Road
Block 17, Unit 3

MATCH POINT 49+00
SHEET 3

N

Burneace Terron
1533 Valley Forge Road
Block 15, Unit 6

Richard E. & Shirley A. Schultz
1547 Valley Forge Road
Block 15, Unit 5

Michael & Linda Evans
1561 Valley Forge Road
Block 15, Unit 4

Dennis & Julie Ahern
1577 Valley Forge Road
Block 15, Unit 14

MATCH POINT 49+00
SHEET 3

3/4" PK

VALLEY FORGE ROAD

EXIST. 16" D.I.P.T.J. (ME 332)

EXIST. FH#
16" x 6" FH TEE
M.J. 6" GATE VALVE
M.J. 6" D.I.P. 5
1/4" MUELLER FH

Howard A. & Ruth Sue Brunner
1566 Valley Forge Road
Block 17, Unit 2

EXIST. FH#
16" x 6" FH TEE
M.J. 6" GATE VALVE
M.J. 6" D.I.P. 5
1/4" MUELLER FH

MATCH POINT 49+00
SHEET 3

Worcester Historical Society
1561 Valley Forge Road
Block 15, Unit 3

VACANT

Burton Hynes & Susan McBride
1581 Valley Forge Road
Block 15, Unit 2

VACANT

Burton Hynes & Susan McBride
1591 Valley Forge Road
Block 15, Unit 18

VACANT

Burton Hynes & Susan McBride
1581 Valley Forge Road
Block 15, Unit 1

HEEBNER ROAD

MATCH POINT 2+50
SHEET 6

Sovereign Bank
3001 Heebner Road
Block 14A, Unit 1
Acct.# 1-26-02000-07

PROP.
6"-8" 45° BENDS M.J.

8" PLASTIC 45° BEND

VALLEY FORGE ROAD S.R. 0363

EXIST. 16" D.I.P. (ME 332)

EXIST. 16" D.I.P.T.J. (ME 332) 13.00'

EXISTING 15' PERM. EASEMENT

EXIST.
16" x 12" TEE M.J.
16" GATE VALVE M.J.
1-12" GATE VALVE M.J. (raised to top)
12" PLUG M.J.
12" PLUG TO BE REMOVED

1750' FROM POTSHOP ROAD

Carl J. & Diane L. Komorowski
1607 Valley Forge Road
Block 14A, Unit 13

Philadelphia Variety Club
Potshop Road
Block 17, Unit 23

CONNECTED

EXIST. 16" x 6" FH TEE M.J. 6" GATE VALVE M.J. 6" D.I.P. 5 1/4" MUELLER FH

EXIST. 16" x 6" TEE M.J. 16" BUTTERFLY VALVE M.J. 6" GATE VALVE M.J. (raised to top) 12" PLUG M.J.

POTSHOP ROAD

PROP.
16" x 12" REDUCER M.J.
2-16" 45° BENDS M.J.

Block 18, Unit 25

F. Lynn & Sylvia L. Christy
1718 Valley Forge Road
Block 18, Unit 10

0 60 120 240 320
SCALE IN FEET

NO.	BY	DATE	REVISION	APP'D.
5.				
4.				
3.				
2.				
1.	SJL	03-02-99	USEPA SUBMITTAL	ELC

NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

VALLEY FORGE ROAD

DRAWN BY:	SJL	SCALE:	PROJECT NO. 70824.01
CHECKED BY:	ELC	SHOWN	FILE NO. 0218.DWG
APPROVED BY:	ELC	DATE PRINTED:	SHEET 9 of 10
DATE:	MARCH 1999		

RMT, INC.
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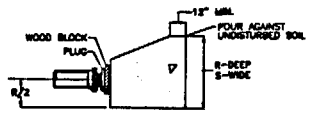
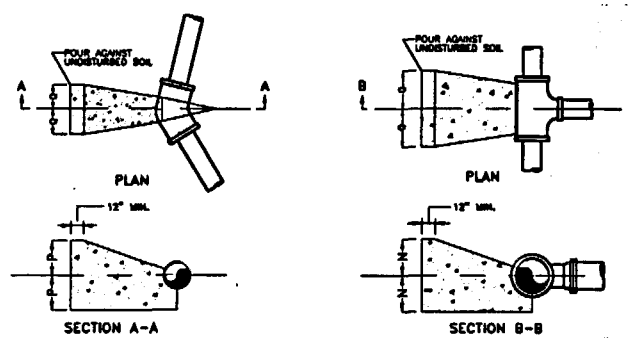
P.O. BOX 991 48106-0991
PHONE: 313-971-7080
FAX: 313-971-9022

AR002922



PLUGS



HORIZONTAL & VERTICAL UPWARD BENDS

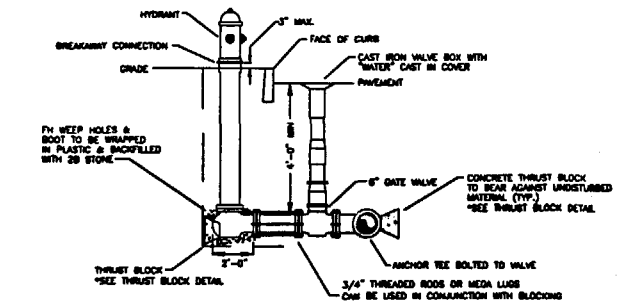
TEE

THRUST BLOCKS FOR TEES, HORZ. & VERTICAL BENDS AND PLUGS						
DESCRIPTION	DIMENSION	6"ø	8"ø	10"ø	12"ø	16"ø
TEES	H	0'-10"	1'-3"	1'-3"	1'-3"	2'-1"
	D	0'-10"	1'-3"	1'-3"	1'-3"	2'-1"
	F	1'-0"	1'-4"	1'-5"	1'-11"	3'-0"
90° BENDS	G	1'-0"	1'-4"	1'-5"	1'-11"	3'-0"
	H	0'-8"	1'-0"	1'-1"	1'-5"	2'-3"
45° BENDS	G	0'-8"	1'-0"	1'-1"	1'-5"	2'-3"
	H	0'-5"	0'-8"	0'-9"	1'-0"	1'-7"
22 1/2° BENDS	F	0'-7"	0'-9"	0'-11"	1'-0"	1'-6"
	G	0'-7"	0'-9"	0'-11"	1'-0"	1'-6"
11 1/4° BENDS	F	0'-5"	0'-6"	0'-8"	0'-9"	1'-0"
	G	0'-5"	0'-6"	0'-8"	0'-9"	1'-0"
PLUGS	R	1'-6"	2'-4"	3'-10"	3'-4"	5'-1"
	S	1'-6"	2'-4"	3'-10"	3'-4"	5'-1"

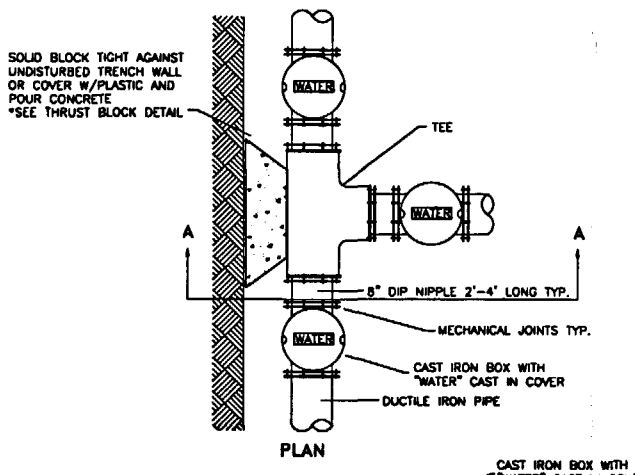
HORZ. & VERT. BENDS

THRUST BLOCKS DESIGNED FOR 200 LBS. PER SQ. IN. TEST PRESSURE AND 2000 LBS. PER SQ. FT. SOIL PRESSURE
WRAP ALL FITTINGS IN PLASTIC BEFORE POURING CONCRETE.

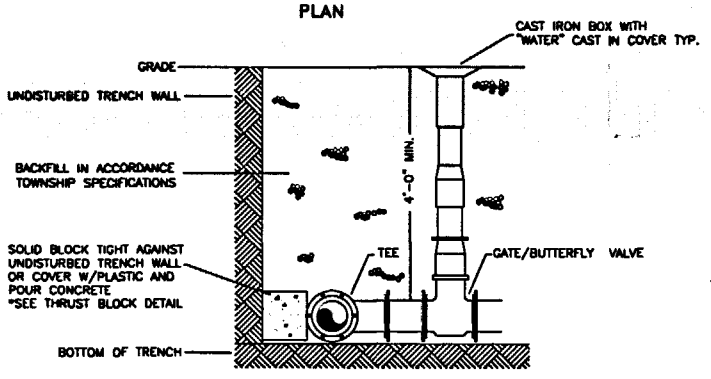
THRUST BLOCK DETAIL



FIRE HYDRANT CONNECTION/LOCATION DETAIL

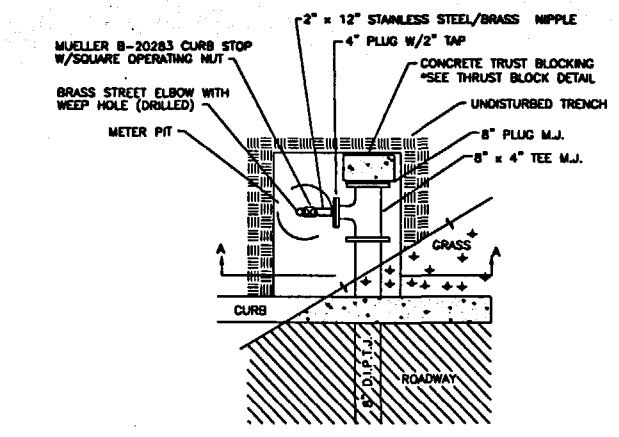


PLAN

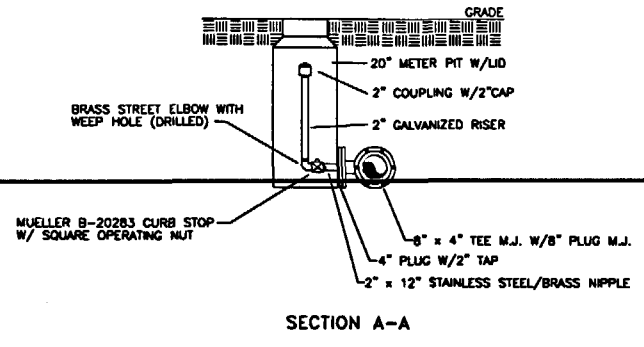


SECTION A-A

TYPICAL INTERSECTION INSTALLATION

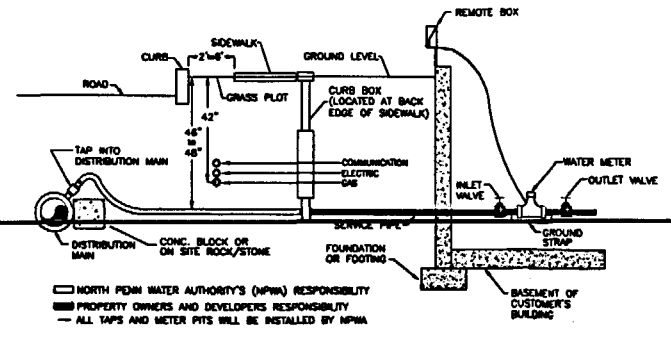


PLAN



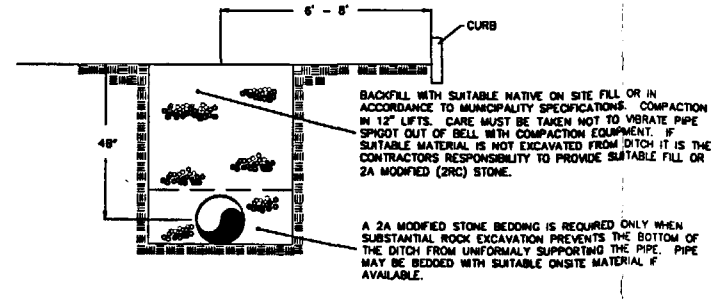
SECTION A-A

NPWA STANDARD 2" BLOW-OFF VALVE INSTALLATION

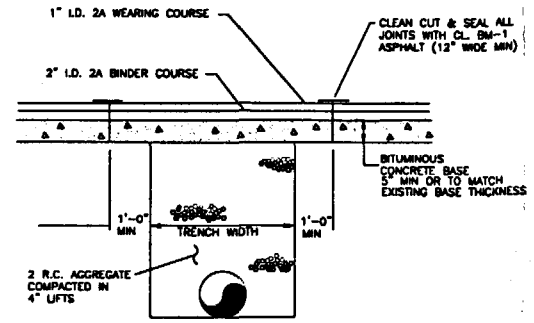


*SEE NPWA DETAILED SPECIFICATIONS FOR METER INSTALLATION

DOMESTIC SERVICE CONNECTION/LOCATION DETAIL

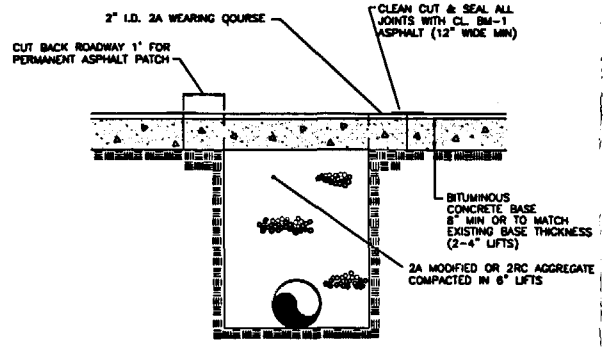


TYPICAL SUBDIVISION ROADWAY



NOTE:
ALL MATERIALS AND CONSTRUCTION METHODS SHALL COMPLY WITH PENNDOT SPECIFICATIONS, FORM 408, 1976

STATE HIGHWAY PERMANENT RESTORATION



NOTE:
1. ROADWAYS WILL BE PADDED TO PREVENT DAMAGE FROM BUCKETS OR OUTRIGGERS
2. ALL MATERIALS AND CONSTRUCTION METHODS SHALL COMPLY WITH PENNDOT SPECIFICATIONS, FORM 408, CURRENT EDITION
3. FULL WIDTH OF ROAD SHOULDERS WILL BE COMPACTED WITH WITH 2A MODIFIED WITHIN 3' OF ASPHALT ROAD SURFACE
4. SOLD PATCH TEMPORARY PATCHES WITH PERMANENT RESTORATION WITHIN 90 DAYS
5. THIS SPEC WILL BE FOLLOWED UNLESS AMENDED BY AGREEMENT WITH TOWNSHIP
6. FINAL RESTORATION NO SOONER THAN 30 DAYS AFTER BACKFILL COMPACTION

TYPICAL ROADWAY RESTORATION

GENERAL NOTES

WATER MAIN INSTALLATION

INSTALLATION MAY COMMENCE WHEN DEVELOPERS ESCROWS SIGNED AGREEMENTS AND BOARD APPROVALS ARE IN PLACE. 24 HOUR NOTICE MUST PROVIDED BEFORE PIPE MAY BE INSTALLED.

DUCTILE IRON PIPE AND FITTINGS

1. DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI A21.51 (AWWA C151) AMERICAN STANDARD FOR DUCTILE IRON PIPE.

2. PIPE SHALL BE CLASS 52 THICKNESS IN ACCORDANCE WITH ANSI A21.51 (AWWA C151).

3. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE CEMENT LINED AND COATED OUTSIDE WITH A BITUMINOUS SEAL COAT IN ACCORDANCE WITH ANSI A21.4 (AWWA C104).

4. THE FITTINGS SHALL BE MECHANICAL JOINT FITTINGS AND SHALL CONFIRM TO ANSI A21.10 (AWWA C110 AND ANSI A21.11 (AWWA C111) EXCEPT WHERE DETAILED OTHERWISE ON THE DRAWINGS.

VALVES AND VALVE BOXES

VALVES CONNECTED TO LIVE WATER MAINS MAY ONLY BE OPERATED BY NPWA PERSONNEL. CONTRACTORS AND DEVELOPERS MAY NOT OPERATE ANY CHARGED WATER MAIN OPEN TO THE SYSTEM.

1. ALL GATE VALVES SHALL BE EITHER:
– MUELLER SUPER SEAL 2A-2380-20LN GATE VALVE MANUFACTURED MUELLER CO., DECATUR, ILLINOIS.

– METRO SEAL 250 RESILIENT SEATED GATE VALVE MANUFACTURED BY U.S. PIPE AND FOUNDRY CO., BIRMINGHAM, AL.

2. BUTTERFLY VALVES WILL BE USED FOR ALL 12" OR LARGER INSTALLATIONS.

3. ALL BUTTERFLY VALVES SHALL BE MUELLER LINE SEAL III BUTTERFLY VALVE NO. B-3211-20. MANUFACTURED BY HENRY PRATT CO.

4. VALVES SHALL BE MOUNTED VERTICALLY, EXCEPT IF OTHER WISE NOTED ON THE DRAWINGS AND SHALL HAVE MECHANICAL JOINT ENDS.

5. ALL VALVES SHALL OPEN BY TURNING CLOCKWISE AND SHALL HAVE A STANDARD 2" OPERATING NUT.

6. ALL BURIED VALVES SHALL BE FURNISHED WITH A CAST IRON VALVE BOX. ALL VALVE BOXES SHALL BE EITHER:
– BUFFALO TYPE-TWO (2) PIECE SCREW TYPE 8-1/4" SHAFT.

– TYLER SERIES 6850, MANUFACTURED BY TYLER PIPE COMPANY.

7. VALVE BOXES SHALL BE TWO-PIECE, SCREW-TYPE INSTALLED OVER THE BONNET AND OPERATING NUT. VALVE BOXES SHALL BE OF SUFFICIENT LENGTH TO REACH THE SURFACE OF THE GROUND BUT NOT EXTEND ABOVE THE GROUND SURFACE. VALVE NUT EXTENSIONS SHALL BE INSTALLED AS NECESSARY TO ENSURE THE VALVE CAN BE TURNED FROM GROUND LEVEL WITH A 6' LONG VALVE NUT KEY WRENCH.

8. DEVELOPERS AND THIER CONTRACTORS SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTANCE OF VALVE BOXES. VALVE BOXES SHALL BE IN A VERTICAL OPERABLE CONDITION. ALL BROKEN, BURIED OR FILLED VALVE BOXES WILL BE DUG OUT AND REPAIRED AT THOR EXPENSE.

FIRE HYDRANTS

1. ALL FIRE HYDRANTS SHALL BE EITHER:
– MUELLER CENTURION 8-1/4-INCH FIRE HYDRANT AWWA TYPE FIRE HYDRANT MANUFACTURED BY MUELLER CO., DECATUR, ILLINOIS.

– KENNEDY K-81D, 5 1/4-INCH FIRE HYDRANT AWWA TYPE FIRE HYDRANT MANUFACTURED BY KENNEDY VALVE, ELMIRA, NEW YORK.

2. ALL FIRE HYDRANTS SHALL HAVE:
– 6-INCH MECHANICAL JOINT INLET CONNECTION
– ONE (1) 4-1/2-INCH STEAMER NOZZLE
– TWO (2) 2-1/2 -INCH HOSE NOZZLE
OPEN LEFT HYDRANT OPERATING & NOZZLE CAP NUTS; FIRE HYDRANT STEAMER & HOSE THREADS TO BE NATIONAL STANDARD OR NORTH PENN THREADS AS NOTED ON DRAWING.

– NON METERED WATER FROM FIRE HYDRANTS MAY NOT BE USED FOR ANY PURPOSE BY THE DEVELOPER OR CONTRACTOR. METERS MAY BE OBTAINED BY CONTACTING NPWA'S CUSTOMER SERVICE DEPARTMENT. UNAUTHORIZED USE OF WATER FROM FIRE HYDRANTS IS SUBJECT TO A $1500.00 FINE.

CHLORINE DOSAGES

Diameter of pipe in inches	2	3	4	6	8	10	12	16
No. of Ca(OCl)2 Tablets/Pipe	1	1	1	1	2	3	4	6

1. TABLETS WILL BE ATTACHED WITH ADHESIVE IN EACH PIECE OF PIPE INSTALLED.

2. CALCIUM HYPO CHLORITE CONFORMING TO AGA/NPWA B300 IS AVAILABLE IN 5-G TABLETS, AND CONTAINS APPROX. 65 PERCENT AVAILABLE CHLORINE BY WEIGHT.

TRAFFIC CONTROL

1. TRAFFIC CONTROL ON ALL STATE, TOWNSHIP AND BOROUGH ROADWAYS WILL BE IN ACCORDANCE WITH PENN DOT SPECIFICATIONS; PUBLICATION 203, FIG. 10A & 10B.

ROADWAY AND RIGHT OF WAY

1. ROADWAY RIGHT OF WAY RESTORATION WILL BE IN ACCORDANCE WITH PENN DOT SPECIFICATIONS ON STATE ROADWAYS, TOWNSHIP AND BOROUGH SPECIFICATION ON LOCAL MUNICIPALLY MAINTAINED ROADWAYS.

TAPS

1. ALL TAPS ARE INSTALLED BY NPWA.

2. SERVICES WILL BE INSTALLED AT THE LOCATION DETERMINED BY THE DEVELOPER OR THEIR SURVEY CONTRACTOR.

3. SERVICE TAPS WILL BE INSTALLED ONLY WHEN THE FOLLOWING REQUIREMENTS ARE MET:
– NPWA WILL FILL THE WATER MAIN WAIT 24 HOURS THEN FLUSH THE MAINS.

– A PRESSURE TEST WITH A MINIMUM PRESSURE OF 150 PSI FOR FOUR (4) HOURS WITHOUT LEAKS, CONDUCTED BY THE CONTRACTOR AND WITNESSED BY N.P.W.A.

– A BACTERIA TEST IS TAKEN AFTER THE LINES ARE FLUSHED WITH RESIDUAL CHLORINE OF 1.0 PPM OR LESS, CONDUCTED BY NPWA.

4. CURB BOXES INSTALLED BY NPWA WILL BE MAINTAINED IN A VERTICAL OPERABLE CONDITIONS. IT IS THE DEVELOPERS RESPONSIBILITY TO REPAIR, REPLACE AND RESTORE ALL DAMAGED, DESTROYED OR BURIED CURB BOXES.

FIELD NOTES & FIELD DIMENSIONS

1. NORTH PENN WATER AUTHORITY REQUIRES THEIR CONTRACTORS TO SUPPLY THE AUTHORITY WITH DAILY FIELD NOTES AND OR AN AS-BUILT DRAWING. NPWA'S CONSTRUCTION INSPECTOR WILL SUPPLY DAILY FIELD NOTE SHEETS.

NO.	BY	DATE	REVISION	APP'D.
5.				
4.				
3.				
2.	S.J.L.	03-02-99	USEPA SUBMITTAL	E.L.C.
1.	S.J.L.	02-15-99	USEPA SUBMITTAL	E.L.C.

NORTH PENN AREA 12
WATER MAIN EXTENSION
WORCESTER TOWNSHIP, PENNSYLVANIA

DETAILS

DRAWN BY:	S.J.L.	SCALE: NTS	PROJECT NO. 70824.01
CHECKED BY:	E.L.C.		FILE NO. 0219.DWG
APPROVED BY:	E.L.C.	DATE PRINTED:	Sheet 10 of 10
DATE:	MARCH 1999		

RMT, INC., ARCHITECT
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ANN ARBOR, MI. 48106-2237
P.O. BOX 991 48106-0991
PHONE: 313-971-7080
FAX: 313-971-9022

AR002923

EXHIBIT 4

SITE HEALTH AND SAFETY PLAN

WATER MAIN EXTENSION
HEALTH AND SAFETY PLAN

NORTH PENN AREA 12 SUPERFUND SITE
WORCESTER TOWNSHIP,
MONTGOMERY COUNTY, PENNSYLVANIA

March 1999

Table of Contents

List of Tables

List of Figures

Scope and Applicability

This Health and Safety Plan (HSP) has been developed for the investigation activities at the North Penn Area 12 Superfund Site (Site), located in Worcester Township, Montgomery County, Pennsylvania. The intent of this plan is to establish appropriate health and safety procedures to be followed by RMT site personnel during the project field operations. This plan will be furnished to contractors who must work on-site as information to assist them in developing their own health and safety plan for site work. RMT, Inc. assumes no liability for the implementation of this plan by subcontractors or other contractors. This plan has been developed specifically for RMT personnel and their work activities at the Site.

Section 1
Coordination and Responsibility

The following Health and Safety Plan (HSP) has been prepared for the investigations at the North Penn Area 12 Site. This plan is intended to provide a framework for the safe conduct by RMT personnel of the field activities at the Site. As such, the plan provides procedures aimed at reducing the potential for accidents from physical hazards, and the potential for exposure to chemical contaminants which may be present in the water, soil, and air.

The Technical Coordinator will not allow work to begin at the Site until this HSP has been provided to all RMT field personnel who will be working at the site. Before visiting the work site, personnel must attend a briefing session, to be conducted by the Health and Safety Coordinator (HSC) or a designee, on the potential site hazards and specific requirements of this HSP, including training in the proper function and operations of air monitoring and personal protective equipment. The designated Site Health and Safety Representative (HSR) will be the senior field representative continually on site during any site activity and will be responsible for implementing the site-specific HSP during field operations. If there is any question whether an unplanned occurrence on site may compromise health and safety, the HSR has the authority to interrupt operations and to remove all personnel from the area. If possible, the HSC should be consulted before any operation is interrupted. If work is stopped due to any health and safety concern, immediate attention should be given by health and safety personnel, working in cooperation with the Project Manager, to identify and correct the cause of concern as quickly as possible. Any such incident will be fully documented by the HSR in a report to the HSC and Project Manager. In the event of a work stoppage, the client must be notified as soon as possible, and kept apprised of progress in resolving the incident until normal operations are resumed.

For this investigation, the following organization and responsibilities have been established.

Technical Coordinator: Will be responsible for matters relating to the completion of this investigation.

Field Sampling Technician: Will coordinate the proper handling and shipping of samples and the related documentation.

Health and Safety Coordinator: Will be responsible for

- Having a sound working knowledge of state and federal occupational health and safety regulations;

- Overseeing the implementation of the Health and Safety Program; and
- Informing RMT personnel of the guidelines set forth in the HSP, including the inherent risks of chemical exposure associated with a study of this nature, and in the use of advanced safety equipment and protective clothing designed to protect against chemical exposure.

Site Health and Safety Representative(HSR): The on-site person appointed by the Health and Safety Coordinator and having:

- Responsibility for the field implementation, evaluation, and any necessary field modifications of this HSP; and
- Authority to suspend work at the Site due to non-conformance to, or problems with, the HSP.

The HSR will be responsible for responding to any emergencies following notification or identification of emergency situations. The HSR will:

- Notify appropriate individuals and/or health care facilities of an emergency. Table 13-1 is a list of emergency telephone numbers that will be posted in the support trailer, in RMT field vehicles, and at the specific site locations as determined by the HSR.
- Maintain appropriate safety equipment at the site: eyewash station, first aid supplies, potable water supply and fire extinguishers.
- Have a working knowledge of safety and fire fighting equipment which is available at the site.
- Keep a map prominently posted at the field office facilities which details the most direct route to the nearest hospital.

The HSR may also serve as the Field Coordinator.

Section 2
Site Description

2.1 Site Location

The North Penn Area 12 Site includes the former Transicoil facility, which occupies approximately 25 acres on Trooper Road in Worcester Township, Montgomery County, Pennsylvania (Figure 1). The former Transicoil facility had been used for industrial and manufacturing activities from approximately 1952 to 1991. Activities included the manufacturing of electric motors for use by the aerospace industry. As part of the manufacturing operations, trichloroethene (TCE), 1,1,1-trechloroethane (1,1,1-TCA) and possibly other solvents were used to degrease parts and equipment.

Adjacent to the former Transicoil facility is the former Control facility for a Nike Missile Battery installation (PH-191) that had been operated by the U.S. Army (Figure 2). The former Nike control facility property was used by the Army from 1954 to 1968 and was located on approximately 12 acres of land. Both TCE and 1,1,1-TCA were used and disposed of at the former Nike Control facility between 1954 and 1968. In 1975, about 9 acres of the property were donated to Worcester Township and is now maintained as a park known as Nike Park. The remaining portion of the property was assigned to the Commonwealth of Pennsylvania, and is currently operated by Montgomery County as a rehabilitation center for the handicapped known as the Center Point Training Center.

2.2 Site History

Sampling of soil and groundwater at the Transicoil facility in 1979, carried out by the Pennsylvania Department of Environmental Protection (PADEP) (then the Pennsylvania Department of Environmental Resources), indicated the presence of TCE and 1,1,1-TCA in groundwater below both the Transicoil property and several surrounding properties' wells. Investigation of contamination at the Transicoil facility and in the surrounding area has been conducted on several occasions since that time. An investigation in 1980 included: sampling near a buried waste solvent tank; sampling of the contents of the waste solvent tank; sampling from underground septic system distribution boxes; and soil sampling in the septic system drain field area. Groundwater in two monitoring wells was also monitored for one year.

In January 1987, the Transicoil property was proposed for inclusion on the National Priorities List. A soil-gas survey was completed on the Transicoil facility in 1988. A consent agreement between USEPA and two potentially responsible parties (PRPs), Transicoil, Inc. and Eagle-

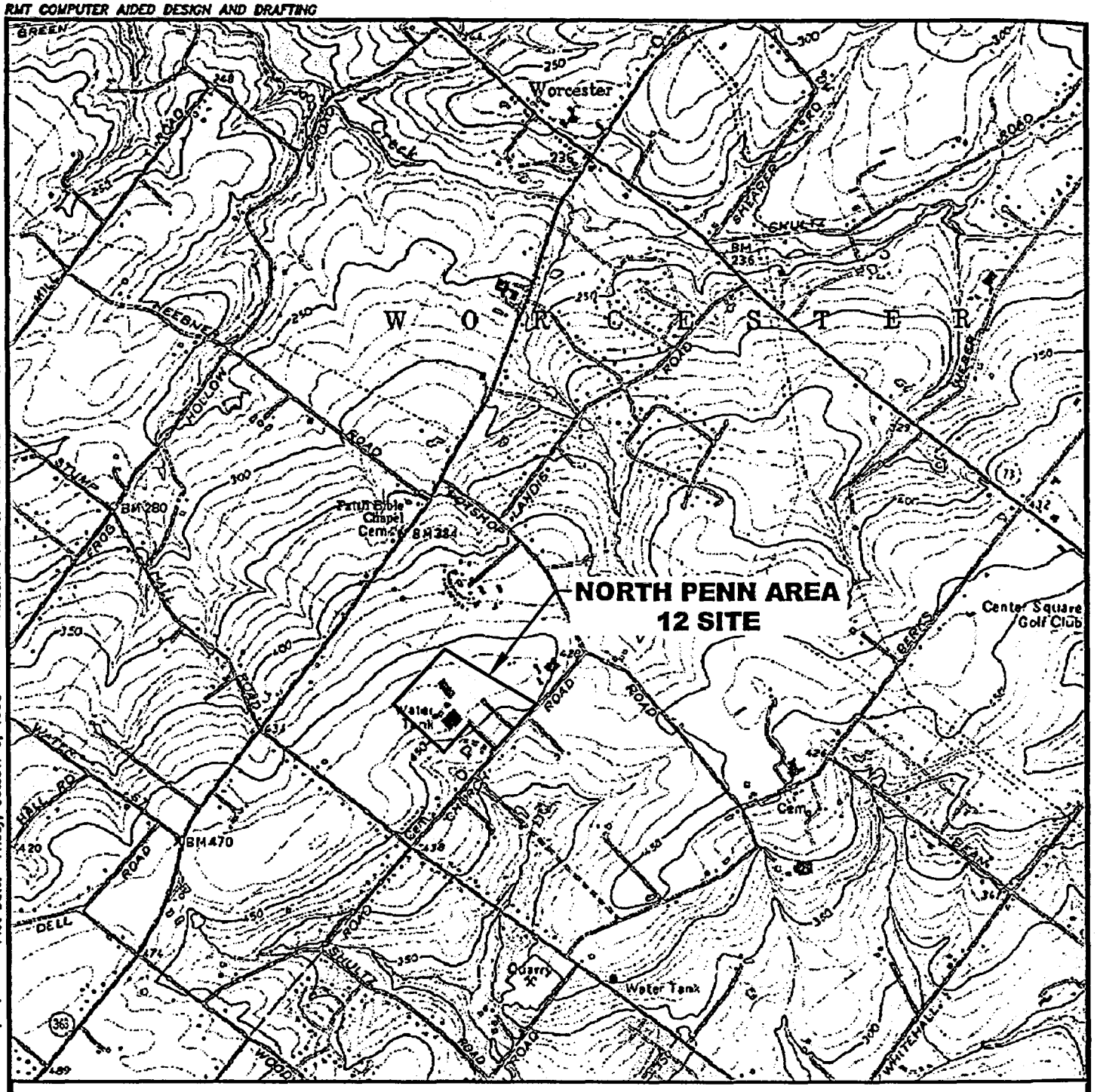
Picher Industries, Inc. ("Transicoil/Eagle-Picher") was executed in 1989 and led to the initiation of a Remedial Investigation/Feasibility Study (RI/FS) at the Site. The RI/FS work plan was submitted to USEPA Region III on May 18, 1990. USEPA subsequently approved the work plan and the field work was started.

A soil-gas survey conducted by Transicoil/Eagle-Picher in 1990 as part of the RI/FS indicated elevated levels of volatile organic compounds (VOCs) near Building No.2 and the drum storage areas. Levels of TCE and 1,1,1-TCA were very low, although significant concentrations of vinyl chloride, a TCE and 1,1,1 - TCA degradation product, was detected. A hydrogeologic study was conducted in July and August 1988, and indicated the presence of a TCE plume that seemed to be moving from east to west. Twelve monitoring wells were installed on and near the Transicoil property between 1988 and 1990. Residential wells near the former Transicoil facility were sampled in 1990 and again in 1991. During the residential well sampling, 13 home wells were found to contain TCE above the safe drinking water Maximum Contaminant Level (MCL) of 5 parts per billion (ppb). Transicoil/Eagle-Picher agreed, under an amendment to the approved RI/FS work plan, to install and maintain carbon filtration systems on those home wells, that exceeded the 5 ppb MCL for TCE.

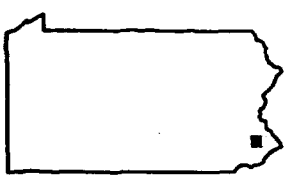
All ongoing RI/FS activities were halted on January 7, 1991, when Transicoil/Eagle-Picher filed for relief under Chapter 11 of the bankruptcy code. At the time of the bankruptcy filing, the RI/FS field investigation activities were in progress and no draft or final documents or reports had been prepared. In accordance with the consent agreement, USEPA Region III assumed responsibility for funding, management, and completion of all remaining RI/FS activities. The tasks to be completed included air monitoring, soil sampling, surface water and sediment sampling, residential well sampling, monitoring well installation, groundwater sampling, geophysical logging, packer testing, pump testing, water level monitoring, wetlands assessment, and preparation of all associated reports and documents.

As a result of residential well sampling conducted in 1995 by USEPA, additional residential wells were found to be contaminated with TCE above the 5 ppb MCL for TCE. USEPA subsequently issued an order to four PRPs that required the installation and maintenance of carbon filtration systems on residential wells found to have concentrations of TCE above the MCL. Periodic sampling of over 100 residential wells near the Site was also required to ensure that TCE levels in residential water supplies would be maintained at safe levels. Fourteen additional home wells have been provided carbon filters in accordance with the 1995 order.

RMT COMPUTER AIDED DESIGN AND DRAFTING



PENNSYLVANIA



QUADRANGLE LOCATION

N

0 2000' 4000'

SCALE IN FEET

SOURCE:

BASE MAP DEVELOPED FROM THE LANDSDALE, PENNSYLVANIA 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP, DATED 1966, PHOTOREVISED 1983.

RMT INC. MICHIGAN

NORTH PENN AREA 12
REMEDIAL DESIGN WORK PLAN
WORCESTER TOWNSHIP, PENNSYLVANIA

SITE LOCATION MAP

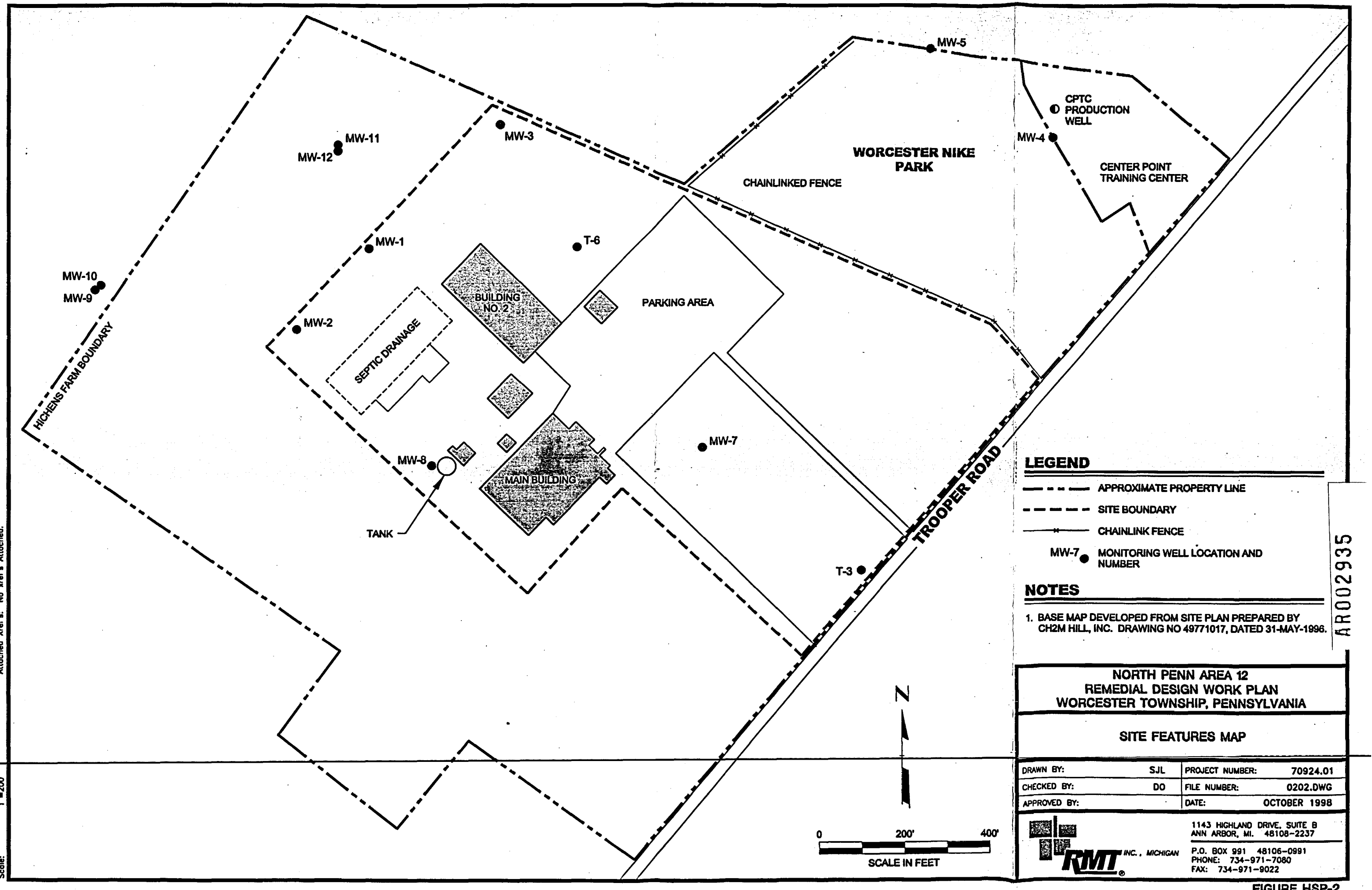
DRAWN BY:	SJL
APPROVED BY:	DO
PROJECT NUMBER:	70924.01
FILE NUMBER:	0101.DWG
DATE:	OCTOBER 1998

Drawing Name: J:\70924\01\0101.DWG Operator Name: lucidos Scale: 1"=1' Dwg Size: 101121 Bytes Plot Date: Friday, October 9, 1998 Plot Time: 11:27:5595 AM Attached Xref's: No xref's Attached.

PLOT DATE

AR002934

FIGURE HSP-1



LEGEND

- APPROXIMATE PROPERTY LINE
- SITE BOUNDARY
- CHAINLINK FENCE
- MW-7 ● MONITORING WELL LOCATION AND NUMBER

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PREPARED BY CH2M HILL, INC. DRAWING NO 49771017, DATED 31-MAY-1996.

NORTH PENN AREA 12
REMEDIAL DESIGN WORK PLAN
WORCESTER TOWNSHIP, PENNSYLVANIA

SITE FEATURES MAP

DRAWN BY:	SJL	PROJECT NUMBER:	70924.01
CHECKED BY:	DO	FILE NUMBER:	0202.DWG
APPROVED BY:		DATE:	OCTOBER 1998

RMT INC., MICHIGAN
1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
P.O. BOX 991 48106-0991
PHONE: 734-971-7080
FAX: 734-971-9022

FIGURE HSP-2

AR002935

PLOT DATA
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Operator Name: lucidos
Scale: 1"=200'
Dwg Size:
Plot Date: 350585 Bytes
Plot Time: Friday, October 9, 1998 11:33:56:54 AM
Attached Xref's: No xref's Attached.

Section 3
Project Description

The Remedial Design Work Plan requires that one round of samples will be collected from existing monitoring wells MW-1, 2, 3, 4, 5, 7, 8, 9,10, 11 and 12, and the three on-site production wells T-3, T-5, and T-6.

In the Field Sampling Plan (Appendix A), the methods of operation for each applicable activity are discussed in detail. During implementation of these tasks, it is required that all RMT field personnel adhere to the health and safety protocols as specified in the HSP. Additionally, they will maintain an awareness of health and safety issues and to perform work in as safe a manner as possible. This involves constant vigilance for unsafe or potentially hazardous conditions or practices and initiating immediate corrective actions to solve or avoid potentially dangerous conditions or practices.

Section 4
Hazard Assessment

4.1 Chemical Hazards

The site risks are summarized in Section 2.5 of the Remedial Design Work Plan. A review of the site history and backup data indicates that no conditions immediately dangerous to life or health (IDLH) have been identified or exist on the site. The majority of the contamination on and off the site was detected in groundwater. The main groundwater contaminants that were detected are TCE, 1,1,1-TCA, 1,1-DCE, Freon-113, and arsenic. The highest TCE concentration detected in groundwater on the site is 380 µg/L. NIOSH assigns an IDLH concentration of 1000 ppm to TCE. The OSHA PEL is 100 ppm. Concentrations are anticipated to be well below 100 ppm in the breathing zone Chemical properties and other information concerning TCE are provided in Table 1.

The primary potential routes of exposure are:

- Inhalation of volatile compounds.
- Skin absorption through contact with contaminants or contaminated articles.
- Ingestion from contact by accidentally transmitting contaminants to the mouth after skin contact with contaminated solids and liquids.

Inhalation of airborne vapors is not considered to be a likely path of exposure due to the low concentrations of TCE in the groundwater and the open, non-enclosed space under which sampling will occur.

TCE can be absorbed through the skin, therefore dermal exposure to contaminated soils and water will be minimized by the donning of rubber gloves during well purging and sampling. The level of protection will be determined by the Site Health and Safety Representative based on the requirements of this Plan. The protective equipment to be worn will be at a minimum, chemical resistant gloves.

TABLE 1
Chemical Properties And Information Concerning Trichloroethylene

Hazard class: Trichloroethylene (TCE) is a colorless liquid with a chloroform-like odor (ClCH=CCl2).

CAS number: 79-01-6

RTECS number: KX4550000

A. TCE has the following chemical and physical properties.

Physical description: colorless liquid with a chloroform-like odor.
Flash point: none.
Vapor pressure: 58 mmHg
Incompatibilities & Reactivities: Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)
The ACGIH Time Weighed Average (TWA) is 50 ppm.
The ACGIH Short Term Exposure Limit (STEL) is 100 ppm.
The OSHA Permissible Exposure Limit (PEL) is 100 ppm.

B. NIOSH recommends the following personal protection and sanitation:

Clothing:	Any possibility of liquid contact and repeated or prolonged vapor contact with skin should be avoided.
Eye Protection:	Goggles worn when a reasonable probability of eye contact exists.
Wash:	Immediately wash when skin is contaminated with liquid; promptly wash when skin is contaminated with solid.
Change:	Not required.
Remove:	Remove clothing that is wet or contaminated.

Provide a quick drench eyewash.

TABLE 1

Chemical Properties And Information Concerning Trichloroethylene

C. OSHA mandates the following level of respiratory protection up to the indicated air concentration.

1000 ppm - Any half-face chemical cartridge respirator with organic vapor cartridge(s) in combination with a high efficiency particulate filter (MSA GMA-H)

5000 ppm - Any chemical cartridge respirator with a full-face piece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter. (MSA GMA-H)

100,000 ppm - Any supplied air respirator with a half- or full-face piece and operated in a pressure demand or other positive pressure mode.

D. Exposure Routes

The primary routes of exposure are as follows:

Inhalation
Skin absorption
Ingestion
Skin and/or eye contact

E. Symptoms of Exposure

NIOSH indicates the following general symptoms of exposure: irritation of eyes and skin; headache, vertigo (an illusion of movement); visual disturbance, fatigue, giddiness, tremor, somnolence (sleepiness, unnatural drowsiness), nausea, vomiting; dermatitis; cardiac arrhythmia, paresthesia; liver injury; [Potential occupational carcinogen].

F. First Aid Procedures

NIOSH indicates the following general first aid procedures:

eyes - irrigate immediately
skin - wash promptly with soap and water
breathing difficulties - begin artificial respiration
ingestion - obtain immediate medical attention

4.2 Physical Hazards

Physical and biological hazards may pose the greatest risk to site personnel. Heat stress, cold stress, insects, and snake bites, are hazards with more potential for immediate acute effects to personnel. Equipment and utilities are not considered to be physical hazards on the Site at this time, as the scope of work for this HSP covers collecting groundwater samples. Appropriate work practices and protective measures are addressed in this plan.

4.2.1 Heat Stress

The USEPA Standard Operating Safety Guides (USEPA, 1992) recommend that a heat stress monitoring program be implemented when employees are wearing impervious clothing and ambient temperatures are 70°F or above. The frequency of monitoring should increase as temperatures increase, and employees should be monitored after each work period when ambient temperatures exceed 85°F. The following monitoring program recommended by the USEPA guide shall be used by personnel when ambient temperatures exceed 70°F:

Heart Rate (HR) shall be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period shall be shortened by 10 minutes, while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle shall be shortened by another 33 percent.

All personnel shall remain alert to the symptoms of heat stress. The general symptoms include the following:

- Heat Rash - Decreased ability to tolerate heat, chafing clothes.
- Heat Cramps - Muscle spasms and pain in the extremities and abdomen.
- Heat Exhaustion - Shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.
- Heat Stroke - Red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong rapid pulse; coma. Immediate medical assistance must be obtained.

Preventive measures for heat-stress shall include shaded rest areas and ample quantities of cool liquids for worker consumption.

4.2.2 Cold Stress

Persons working outdoors in low temperatures, especially at or below freezing, are subject to cold stress. Areas of the body that have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible to damage.

Protective clothing generally does not afford protection against cold stress. In many instances, it increases susceptibility due to a reduction in wind chill awareness and exposure to lower than perceived ambient temperatures.

Two factors influence the development of cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. A copy of the wind-chill chart is included as Table 2.

Frostbite

Local injury resulting from cold is included in the generic term frostbite.

Symptoms:

The following symptoms are indicative of frostbite:

- Frost nip is characterized by sudden blanching or whitening of skin.
- Superficial frostbite is characterized by skin that has a waxy or white appearance and that is firm to the touch, but the tissue beneath is resilient.
- Deep frostbite is characterized by tissue that is cold, pale, and solid.

Treatment:

Bring the victim indoors, and warm the areas quickly in warm water. Never place frostbitten tissue in hot water because the area will have a reduced heat awareness and such treatment may result in burns. Give the victim a warm drink. The victim must not smoke. Keep the frozen parts in warm water or covered with warm clothes for 30 minutes. The tissue will be very painful as it thaws. Then, elevate the injured area and protect it from physical injury. Do not allow blisters to be broken. Use sterile, soft, dry material to cover the injured areas.

Keep the victim warm and get immediate medical care.

DO NOT:

- Rub the frostbitten part (this may cause gangrene).
- Use ice, snow, gasoline, or anything cold on the frostbitten area.

- Use heat lamps or hot water bottles to warm the frostbitten area.
- Place frostbitten tissue near a hot stove.

Table 2
Wind-Chill Chart
Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind speeds greater than 40 mph have little additional effect	LITTLE DANGER For less than 1 hour with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within 1 minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trenchfoot and immersion foot may occur at any point on this chart.											

* Developed by US Army Research Institute of Environmental Medicine, Natick, MA.

Hypothermia

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperatures.

Symptoms:

Symptoms are usually exhibited in five stages:

1. Shivering
2. Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F
3. Unconsciousness, glassy stare, slow pulse, and slow respiratory rate
4. Freezing of the extremities

5. Death

Treatment:

Keep the victim warm and get immediate medical care.

Generally, field activities should be curtailed if equivalent chill temperature (°F) as defined in Table 3 is below zero (°F) unless the activity is of an emergency nature.

4.2.3 Construction Job Site Safety Practices

The following job site safety practices have been condensed from the OSHA Safety and Health Standards Digest - Construction Industry and are to be followed as a minimum by personnel working at the site.

General Requirements

a) Each employer must initiate and maintain programs to provide for frequent and regular inspections of the job site, materials, and equipment.

b) Each employer must instruct their employees in the recognition and avoidance of unsafe conditions and in the regulations applicable to their work environment to control or eliminate hazards or other exposure to illness or injury.

c) The use of any machinery, tool, material, or equipment that is not in compliance with the applicable requirements is prohibited.

Hand Tools

a) Employers shall not issue or permit the use of unsafe hand tools.

b) Wrenches shall not be used when jaws are sprung to the point that slippage occurs. Impact tools shall be kept free of mushroomed heads. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

c) Electric power operated tools must either be approved double-insulated, properly grounded, or used with ground fault circuit interrupters.

Hazard Communication

a) The purpose of the hazard communication standard is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is disseminated to employers and employees. Disseminating information is accomplished by means of comprehensive hazard communication programs, which include container labeling and other forms of warning, material safety data sheets and employee training.

b) Employers must develop, implement, and maintain a written hazard communication program for their workplaces. Employers must inform their

employees of the availability of the program, including the required list(s) of hazardous chemicals, and material safety data sheets required.

c) The employer must ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with the identity of the hazardous chemical(s) and with clearly visible hazard warnings appropriate for employee protection.

d) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet for each hazardous chemical they use.

e) Employers must provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area. Employers must also provide employees with information on any operations in their work area where hazardous chemicals are present; and the location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and the material safety data sheets required by the standard.

Head Protection

a) Hard hats must be worn in areas where there is a possible danger of head injuries from impact, flying or falling objects, or electrical shock and burns.

b) Hard hats for protection against impact and the penetration of falling and flying objects shall meet the requirements of ANSI Z89.1-1969.

c) Hard hats for protection against electrical shocks and burns shall meet the requirements of ANSI Z89.2-1971.

Hearing Protection

a) Feasible engineering or administrative controls must be used to protect employees against sound levels in excess of those shown in the following table.

b) When engineering or administrative controls fail to reduce sound levels within the limits, hearing protection must be provided and used.

c) Exposure to impulse or impact noise should not exceed 140 dB peak sound pressure level.

d) In all cases where the sound levels exceed the limits, a continuing, effective hearing conservation program must be administered.

e) Permissible Noise Exposures

Duration per day in hours	Sound Level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Washing Facilities

a) Each employer must provide adequate washing facilities for employees engaged in operations involving harmful substances.

b) Washing facilities must be near the work site and be equipped to enable employees to remove all harmful substances.

Drinking Water

a) An adequate supply of potable water must be provided in all places of employment.

b) Portable drinking water containers must be capable of being tightly closed and be equipped with a tap.

c) A common drinking cup is prohibited.

Housekeeping

a. Form and scrap lumber with protruding nails and all other debris must be kept clear from all work areas.

b. Combustible scrap and debris must be removed at regular intervals.

c. Containers must be provided for the collection and separation of all refuse. Covers shall be provided on containers used for flammable or harmful substances.

d. General wastes must be disposed at intervals as specified in the Remedial Action Plan.

Respiratory Protection

a. In emergencies, or when feasible engineering or administrative controls are not effective in controlling toxic substances, appropriate respiratory protective equipment shall be provided by the employer and shall be used.

b. Respirators must be approved by the Mine Safety and Health Administrative/National Institute for Occupational Safety and Health or be

acceptable to the US Department of Labor for the specific contaminant to which the employee is exposed.

c. Respirators must be appropriate for the hazardous material involved and the extent and nature of the work requirements and conditions.

d. Employees required to use respirators shall be thoroughly trained in use and shall have certification of a current fit test and current respiratory test.

e. Respirators must be inspected regularly and maintained in good condition.

Eye and Face Protection

a. Eye and face protection must be provided when machines or operations present potential eye or face injury.

b. Eye and face protective equipment shall meet the requirements of ANSI Z87.1-1968, "Practice for Occupational and Educational Eye and Face Protection."

c. Employees involved in welding operations must be furnished with filter lenses or plates of at least the proper shade number.

Fire Protection

a. A firefighting program is to be followed throughout all phases of the construction work involved. It must provide for effective firefighting equipment to be available without delay, and designed to effectively meet all fire hazards as they occur.

b. Firefighting equipment must be conspicuously located and readily accessible at all times, periodically inspected, and maintained in operating condition.

c. Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

Medical Services and First Aid

a. Each employer must ensure the availability of medical personnel for advice and consultation on matters of occupational health.

b. When a medical facility is not reasonably accessible for the treatment of injured employees, a person trained to render first aid shall be available at the work site.

c. First aid supplies approved by the consulting physician shall be readily available.

d. The telephone numbers of the physicians, hospitals, or ambulances must be conspicuously posted.

Flaggers and Traffic Warning

a. When working in the right-of-way of public roads, signs must be provided and used in accordance with requirements with the Manual on Uniform Traffic Control Devices.

b. When signs, signals, and barricades do not provide necessary protection on or adjacent to a highway or street, flaggers or other appropriate traffic controls shall be provided.

c. Flaggers shall be provided with, and shall wear, a red or orange warning garment while flagging. Warning garments worn at night shall be of reflectorized material.

Flammable and Combustible Liquids

a. Only approved containers and portable tanks can be used for storage and handling of flammable and combustible liquids.

b. No more than 25 gallons of flammable or combustible liquids can be stored in a room outside of an approved storage cabinet. No more than 60 gallons of flammable or 120 gallons of combustible liquids can be stored in any one storage cabinet. No more than three storage cabinets may be located in a single storage area.

c. Inside storage rooms for flammable and combustible liquids must be of fire-resistant construction, have self-closing fire doors at all openings, 4-inch sills or depressed floors, a ventilation system that provides at least six air changes within the room per hour, and electrical wiring and equipment approved for Class I, Division I locations.

d. Storage in containers outside buildings cannot exceed 1,100 gallons in any one area. The storage area must be graded to divert possible spills away from building or other exposures, or it must be surrounded by a curb or dike. Storage areas must be located at least 20 feet from any building and free from weeds, debris, and other combustible materials not necessary to the storage.

e. Flammable liquids must be kept in closed containers when not actually in use.

f. Conspicuous and legible signs prohibiting smoking must be posted in service and refueling areas.

Motor Vehicles and Mechanized Equipment

a. All vehicles in use shall be checked at the beginning of each shift to ensure that all parts, equipment, and accessories that affect safety are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

b. No employer may use any motor vehicle, earth-moving, or compacting equipment having an obstructed view to the rear unless

   - the vehicle has a reverse signal alarm distinguishable from the surrounding noise level; or
   - the vehicle is backed up only when an observer signals that it is safe to do so.

c. Heavy machinery, equipment, or parts which are suspended or held aloft must be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

Power Transmission and Distribution

a. Existing conditions must be determined before starting work, by an inspection or a test.

b. Electric equipment and lines must be considered energized until determined otherwise by testing or until grounding.

c. Operating voltage of equipment and lines must be determined before working on or near energized parts.

d. Rubber protective equipment must comply with the provisions of the ANSI J6 series, and must be visually inspected before use.

Mechanical Power Transmission

a. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded if they are exposed to contact by employees or if they otherwise constitute a hazard.

b. Guarding must meet the requirements of ANSI B15.1-1953 (R 1958), "Safety Code for Mechanical Power Transmission Apparatus."

Electrical Installations

a. Electrical installations made in accordance with the 1993 National Electric Code are considered to be in compliance with OSHA's electrical standards for construction, except for the following additional requirements:

   - Employers must provide either ground-fault circuit interrupters (GFCIs) or an assured equipment grounding conductor program to protect employees from ground-fault hazards at construction sites. The two options are detailed below.

     1. All 120-volt, single-phase, 15-and 20-ampere receptacles that are not part of the permanent wiring must be protected by GFCIs. Receptacles on smaller generators are exempt under certain conditions.

     2. An assured equipment grounding program covering extension cords, receptacles and cord- and plug-connected equipment must be implemented. The program must include the following:

        - A written description of the program
        - At least one competent person to implement the program
        - Daily visual inspections of extension cords and cord- and plug-connected equipment for defects

- Continuity test of the equipment grounding conductors of receptacles, extension cords, and cord- and plug-connected equipment. These tests must generally be conducted every 3 months.

b) Lamps for general illumination must be protected from breakage, and metal shell sockets must be grounded.

c) Temporary lights must not be suspended by their cords, unless they are so designed.

d) Portable lighting used in wet or conductive locations, such as tanks or boilers, must be operated at no more than 12 volts or must be protected by GFCIs.

e) Extension cords must be the three-wire type. Extension cords and flexible cords used with temporary and portable lights must be designed for hard or extra-hard usage (for example, types S, ST, and SO).

Electrical Work Practices

a. Employers must not allow employees to work near live parts of electrical circuits, unless the employees are protected by one of the following means:
   - De-energizing and grounding the parts
   - Guarding the part by insulation
   - Any other effective means

b. In work areas where the exact locations of underground electrical power lines are unknown, employees using jack hammers, bars, or other hand tools that may contact the lines must be protected by insulating gloves.

c. Barriers or other means of guarding must be used to ensure that the workspace for electrical equipment will not be used as a passageway during periods when energized parts of equipment are exposed.

d. Worn or frayed electrical cords or cables cannot be used. Extension cords must not be fastened with staples, hung from nails, or suspended by wire.

e. Equipment or circuits that are de-energized must be rendered inoperative and must have tags attached at all points where the equipment or circuits could be energized.

4.2.4 Work Hours

The work tasks will normally be completed during daylight hours. For work tasks in general site areas, the minimum illumination allowed is 5 foot-candles.

4.3 Biological Hazards

Many of the areas of the Site are overgrown with dense underbrush. To access some of the existing monitoring wells and other areas of the site, these areas must be entered. There are several potential hazards that may be encountered. They include the following:

- *Snakes* - Watch for signs of poisonous snakes on the site. In the event that poisonous snakes are observed, site personnel entering overgrown areas shall wear snake chaps or gaiters.
- *Ticks* - It is anticipated that ticks will be a problem at this site. Tick repellent or other appropriate insect repellent will be used. Long sleeves are recommended. Check often for ticks and bites. If bitten, carefully remove tick with tweezers, making certain to remove pincers, and being careful not to crush or squeeze the tick while extracting, as this could infect the wound. After removing tick, wash hands immediately. Disinfect area and dress. If the tick resists extraction or can not be completely removed, seek medical attention.
- *Other Insects* - Stinging insects such as bees, fire ants, wasps, or yellow jackets are expected to be on-site. Personnel who may have allergic reactions if stung will keep a bee sting kit on-site.
- *Poisonous Plants* - Poison ivy and poison oak may be present at the site. Personnel should avoid contact with these plants.

Section 5
Air Monitoring

During the groundwater sampling operations, ambient air and breathing zone air monitoring will be conducted with the following instrument:

- HNu Model PI-101 Portable Photoionization Analyzer, Foxboro Model OVA 128 Portable Organic Vapor Analyzer, or a Photovac Microtip MP 100 Photoionization Analyzer for volatile organic compounds.

This monitoring will serve to:

- Grossly characterize chemical contaminants encountered during field activities, and

Provide a basis for downgrading or upgrading the level of personal protection. Background readings will be determined at the upwind perimeter of the Site. The air monitoring equipment will be maintained and calibrated by the HSR.

Section 6
Required Personal Protective Equipment (PPE)

All personnel shall be provided appropriate personal safety equipment and protective clothing. Each individual shall be properly trained in the use of this safety equipment before the start of field activities. Safety equipment and protective clothing shall be used as specified in this Health and Safety Plan. All such equipment and clothing shall be cleaned and shall be maintained in proper condition by project personnel. Disposable equipment and clothing shall be properly disposed. Levels of personal protection and the selection of criteria pertinent to field activities at the Site are detailed below.

6.1 Levels of Protection for Work Activities

In general, protective clothing must be worn whenever the potential exists for employees to come in contact with, or to be exposed to, contaminated materials. All respiratory protective equipment used will be approved by NIOSH/MSHA.

Work activities will be conducted under Level D or Level C protection based on the most current information available on potential health and safety hazards on the site. If Level B or Level A protection is deemed necessary, modifications of the Work Plan and an extension of the fieldwork schedule may be required.

6.1.1 Level D Protection

Based on an evaluation of the data and information available to date, field personnel will be adequately protected from potential health hazards present using Level D protection. Hence, fieldwork will be conducted under Level D requirements unless the personal air sampling results indicate that airborne metal or particulate concentrations are exceeding one-half the PEL in employees' breathing zones.

For tasks that involve little or no potential contact with contaminants, Level D protection will apply. Level D protection for these tasks will consist of the following:

1. Work clothes (under no circumstances will shorts, muscle shirts, or going without a shirt be permitted during any type of field investigation).
2. Leather steel-toed work boots (no sneakers).
3. Nitrile gloves (required when handling samples).

4. Hard hat (if overhead hazard present).
5. Options as required:
   - Disposable outer boots or rubber steel-toed boots.
   - Hearing protection.
   - Face shield
   - Tyvek coveralls

6.1.2 Level C Protection

When sample results indicate levels of volatiles are greater than one-half the PEL in employees' breathing zones, Level C protection will be required. Level C requirements include the protective clothing and equipment specified for the various categories of tasks listed under Level D protection plus air-purifying respirators equipped with organic vapor filtration. Each person required to use a respirator must be issued the type and size of respirator as determined by that person's fit test. Full-face, air-purifying respirator equipped with appropriate canisters or cartridges (all personnel requiring respiratory protection are fit tested with the type of respirator face-piece to be used in the field).

6.2 Changes in Levels of Protection

The HSR may authorize a change in the level of protection based on an evaluation of actual field conditions after consulting with the site superintendent.

Section 7
Standard Operating Safety Procedures and Controls

7.1 General Safety Practices

The following are important personal safety precautions which will be enforced during this investigation:

1. Eating, drinking, chewing gum or tobacco, smoking, or any transfer and ingestion of material is prohibited in the contamination reduction zone and the exclusion zone.
2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.
3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed with soap and water as soon as possible after the protective garment is removed.
4. No facial hair that interferes with the mask-to-face seal is allowed on personnel required to wear respiratory protection equipment.
5. Contact with contaminated surfaces or with surfaces suspected of being contaminated should be avoided. Whenever possible, one should not walk through puddles, mud or other discolored surfaces; kneel on ground; lean, sit, or place equipment on drums, containers, vehicles, or the ground.
6. Medicine and alcohol can potentiate the effect from exposure to toxic chemicals. RMT personnel will be informed of the possible potentiation of effects.
7. Personnel and equipment in the contaminated areas should be minimized, consistent with effective site operations.
8. Work areas for various operational activities must be established.
9. Procedures for leaving the contaminated area must be planned and implemented prior to going to the site. Work areas and decontamination procedures must be established on the basis of prevailing site conditions.
10. Respirators will be cleaned and disinfected after each use.
11. Safety gloves and boots shall be taped to the disposable, chemical-protective suits.
12. All equipment determined to be unsafe or dangerous to operate by the Site Health and Safety Representative will be identified by a "DANGER, DO NOT OPERATE" tag, and not operated until repairs are made.
13. Noise mufflers or ear plugs will be required for all personnel working around heavy equipment. Disposable, form-fitting plugs or pre-molded plugs are preferred.

14. Cartridges for air-purifying respirators will be changed daily at a minimum.
15. When self-contained breathing apparatus (SCBA) are on-site, they will be inspected daily by the Site Health and Safety Representative. Air purifying respirators will be inspected before and after each day's work by the user.
16. Work areas shall be lighted according to minimum illumination presented in Table H-120.1, p 45670, 29 CFR Part 1910.120.
17. Facilities will be provided with potable water and at least one toilet if employees number 20 or fewer. One toilet seat and one urinal per 40 employees will be provided if the number of employees are between 20 and 200. Non-potable water will be so labeled.
18. Site excavation shall be sloped or shored in accordance with 29 CFR 1926.650.
19. Appendix C contains a copy of the applicable standard. RMT employees will not enter excavations.
20. Areas that are potentially releasing contaminants due to wind blown particulate will be wetted down to eliminate this release.
21. Whenever possible, all personnel will be upwind of contaminated areas.
22. Only those personnel deemed essential to completing site work will be allowed on-site. Those persons will remain on site only as long as required in order to complete a work task. On-site refers to the exclusion zone and the contamination reduction zone.

7.2 Communications

Field communications will be facilitated by:

1. The use of small exclusion zones; and
2. Scheduling areas of activity in close proximity.

Visual contact must be maintained by site workers when in the exclusion zone. If it cannot be maintained, radio communications should be established. As an added precaution, useful hand signals will be incorporated in site safety procedures.

A cellular telephone shall be kept in the field vehicle.

7.3 Adherence to Buddy System

No field operation is without some degree of risk. For this reason, a minimum of two people must be assigned to all task locations and must stay within voice contact at all times.

7.4 Site Safety and Health Inspections

On a daily basis or more often, the Site Health and Safety Representative or his/her representative will inspect the site, observe work practices and inspect safety equipment to

determine the effectiveness of the Site Health and Safety Plan. The inspector will make sure the general safety practices are being followed by on-site RMT personnel. Any deficiencies in the effectiveness of the Site Health and Safety Plan will be corrected. Such deficiencies will be noted in the inspector's log book.

If the deficiencies involve the actions (or lack of actions) of on-site RMT personnel, the name(s), date and time, specific actions(s) and corrective actions(s) taken will be recorded in the notebook. If the deficiencies involve specific deficiencies in the Health and Safety Plan, the Plan will be amended and all personnel immediately informed of the amendments and the implications of the amendments.

7.5 Confined Space Entry

Entry into any type of confined space is not expected for this site.

Section 8
Site Security and Control

8.1 Site Control

Site control will be established to minimize the potential for exposures to employees and observers on-site, to protect the public from potential on-site hazards, and to prevent vandalism of equipment and materials.

8.2 Site Security

OSHA jobsite poster will be posted in a central and conspicuous location at the site. Any evidence of unauthorized entry will be reported to Clifford Kirchof of RMT.

8.3 Work Zones

An exclusion zone, a contamination reduction zone, and a support zone will be established at the site during work operations to prevent the spread of contaminants during the work and to minimize employee exposure to contaminants.

8.3.1 Exclusion Zone

The exclusion zone is the zone where hazardous substances are likely to be present. During field activities at the site areas, all personnel entering this zone must wear the required protective equipment and be currently trained.

8.3.2 Contamination Reduction Zone

The contamination reduction zone is a transition zone between contaminated and clean zones and serves as a buffer to reduce the possibility of the clean zone becoming contaminated.

The contamination reduction zone will be located immediately adjacent to the exclusion zone in an area that is convenient for access.

Field personnel will wear the required personal protection while working in the contamination reduction zone. Protective equipment worn in the contamination reduction zone will be removed according to the procedures presented in Subsection 5.1. Personnel working in this zone must also be current in the training specified in Subsection 6.1.

8.3.3 Support Zone

The support zone is a non-contaminated or clean area. Support equipment (clean protective equipment, supplies, etc.) will be located in this zone. Normal work clothing is appropriate in this zone. Personnel who remain in this zone are not required to have received the health and safety training for hazardous waste activities specified in 29 CFR 1910.120. However, they must be aware of the site-specific HSP requirements and standard health and safety procedures.

The location of the support zone and any support facilities will be determined based on the following factors:

- Accessibility
- Support services - electric power supply, roads, drinking water, etc.

Section 9
Personnel Decontamination Procedures

Personnel working on this investigation may become contaminated in a number of ways:

1. Inhalation of vapors, gases, mists, or particulates
2. Skin contact with soils or sludge
3. Walking through puddles of liquids or on contaminated soils
4. Using contaminated instruments or equipment

Protective clothing and respirators protect the wearer from becoming contaminated or inhaling contaminants. Good work practices help reduce the contamination of protective clothing, instruments and equipment.

Even with these safeguards, contamination may occur. Potentially harmful materials may be transferred into clean areas, exposing unprotected persons. In removing contaminated clothing, personnel may come into contact with and/or inhale the contaminants. To prevent such occurrence, decontamination procedures are developed and implemented. Such procedures must be in place before anyone enters the site and must continue (modified as necessary) throughout the period of the site operations. Decontamination involves physically removing contaminants and/or converting them into innocuous substances. How extensive decontamination must be depends upon a number of factors, the most important being the types of contaminants involved. Combining decontamination procedures, the correct removal of personal protective equipment, and the establishing work zones minimizes cross-contamination from protective clothing to wearer, from equipment to personnel, and from one area to another.

In general, decontamination involves scrubbing with an Alconox/water solution followed by clean water rinses. All disposable items will be disposed of in a dry waste drum. Certain parts of contaminated respirators, such as harness assemblies and leather or clothing components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. In addition to being decontaminated, all respirators, non-disposable protective clothing and other personal articles must be sanitized before they can be used if they become soiled from exhalation, body oils and perspiration. The manufacturer's instructions should be followed in sanitizing the respirator masks; sanitizing pads will be provided for this purpose. The HSR will monitor for the proper maintenance, decontamination and sanitizing of all respirator equipment by RMT site workers.

If practical, non-disposable protective clothing should be machine washed after a thorough decontamination; otherwise, it should be cleaned by hand.

- The decontamination zone layout and procedures should match the prescribed levels of personal protection.
- The previously described work zones will be established and maintained throughout site field activities. The exclusion zone will be the various sampling areas. A contamination reduction zone will be designated on-site prior to site work. The following issues will be addressed in setting up these areas and the decontamination requirements:

Site Duties: The duties performed by each individual determines the potential for contact with and, hence, potential for contamination. The CRZ at the site will be designed for those individuals requiring maximum decontamination. The Site Health and Safety Representative will, however, be able to modify the decontamination procedure at his discretion for those individuals who have not been in contact with hazards (observers, etc.).

Amount of Contamination. The appearance of visual contamination on a person or a person's protective clothing would require the most thorough decontamination. The Site Health and Safety Representative, as well as the individual, should note the occurrence of gross contamination and discuss possible methods of avoiding this contamination in the future.

Putting on personal protective clothing will consist of the following:

- Put on inner gloves and put on coveralls,
- Put on outer gloves
- Put on boots and/or boot covers,
- Secure interfaces with tape, and
- Put on respirator and fit check with the positive and/or negative pressure test.

Personal protective clothing removal will consist of the following:

- Remove tape around glove and boot interfaces,
- Remove outer gloves,
- Remove coveralls,
- Remove boot covers and/or boots,
- Remove respirator, and
- Remove inner gloves.

Section 10
Emergency Equipment

Emergency equipment available on-site shall include:

- First Aid/Bloodborne Pathogen Kits
- Portable Eyewash (15-minute flush)
- Full Face Respirators - HEPA/Organic Vapor Combination Cartridges (GMA-H),
- Telephone,
- Fire Extinguisher.

In the event of injury, the emergency shall be handled according to the procedures described in the Emergency Procedures Section. The first aid kits shall be maintained at the control access point between the decontamination and support zones and in support vehicles.

Section 11
Emergency and Contingency Procedures

Due to the limited nature of the work, and the small area involved, the emergency response plan will not be as detailed as required for more comprehensive and extensive activities.

11.1 General Emergency Procedures

In the event of a safety or health emergency at the site, appropriate corrective measures must immediately be taken to assist those who have been injured or exposed and to protect others from hazards. Emergency personnel will be notified of the incident immediately. If necessary, first aid will be rendered.

Emergency telephone numbers are found in Table 2. Copies of Table 2 will be posted and kept in field vehicles.

In the event of an emergency, the following will be conducted:

1. The local ambulance, police, fire department and/or hospital will be notified as soon as possible (see Table 2 for appropriate telephone numbers.)
2. The injured or exposed person or persons will be immediately removed from danger. The Site Health and Safety Representative will determine the need to move an injured employee based on the extent of the injury and the extent of the emergency.
3. Affected personnel will be decontaminated and first aid rendered, if necessary.
4. All other personnel on site will be removed from the affected area until the On-Site Coordinator gives the instruction to resume work. Work will not resume until the On-Site Coordinator has determined that it is safe to do so.
5. An incident report will be completed by the HSR by the end of the following shift and copies submitted to the HSC, Project Manager, and Client Representative.
6. A formal accident investigation report will be prepared by the HSC within seven days.

TABLE 3
Telephone Number List

AFFILIATION (NAME)	TELEPHONE NUMBER
RMT Project Coordinator Clifford Kirchof	(W) 864-281-0030 (H)
RMT Technical Coordinator Daniel Oman	(w) 734-971-7080 (h) 734-996-3488
On-Site Coordinator	To be determined
Site Health and Safety Representative	To be determined
RMT Regional Health and Safety Coordinator Mike Bensing	(W) (734) 971-7080 (H) (517) 424-0053
RMT Corporate Health and Safety Director Steve Skipper	(W) (864) 281-0030 (H) (864) 268-2912 (emergency beeper) (888) 576-1899
Schlumberger Emergency Coordinator Dr. Gregory Kubala	(W) (281) 285-7789
Emergency	911
Worcester Township Police Department	(610) 631-5933 (911)
Worcester Township Fire Department	(610) 584-6911 (911)
Ambulance	911
Hospital - Suburban General Hospital 2701 DeKalb Pike Norristown, Pennsylvania	(610) 278-2000
Poison Control Center	(800) 521-6110
National Response Center	(800) 424-8802

The North Penn Area 12 Superfund Site is located at 1547 Trooper Road, Worcester Township, Montgomery County, Pennsylvania.

Directions to Suburban General Hospital: Leaving the Site, turn right (southwest) on Church Road. After approximately 2 tenths of a mile, turn left (southeast) on Stump Road, which becomes Township Line Road. Follow Township Line Road about 2 ½ miles to Dekalb Pike (Route 202). Turn right on Route 202. Follow Route 202 about ½ mile Suburban General Hospital is on the right on the other side of the intersection of Dekalb Pike and Germantown Pike (Route 422). A hospital routing plan (Figure HSP-3) is included in this HSP for reference in an emergency.

11.2 Chemical Exposure First Aid

- Injuries from contaminant inhalation can only be treated by qualified physicians. Remove affected personnel to "fresh" air and contact emergency services.
- If the contaminant is on the skin or in the eyes, immediate measures must be taken to counteract its effect. First aid treatment usually involves flooding the affected area with water.

11.3 Contingency Procedures

Contingencies are developed for:

- Physical injury
- Chemical exposure
- Heat stress
- Cold stress
- Uncontrolled release or fire
- Physical injuries in the form of sprained ankles or backs, puncture wounds, or broken bones are possible. The preponderance of jagged metal, uneven terrain, construction debris, heavy lifting and encumbered movement due to protective equipment also increases the likelihood of physical injuries.
- Significant chemical exposures are probably less likely to occur due to the conservative precautions already taken in the form of respiratory and skin protection. For chemical injuries, on-site first aid is largely limited to the use of eyewashes. If chemical exposure occurs, the HSR will take immediate steps to determine the chemical agent(s). TCE is expected to be the only source of chemical exposure at this site.
- Heat stress incidents are a health concern at the Site. Warm temperatures coupled with the use of impermeable protective clothing would make heat stress a distinct possibility. Practical field techniques for heat stress management can vary greatly in sophistication. Determination of pulse rate and oral temperatures may be deemed appropriate in some cases, while modification of traditional work schedules may suffice in others. As a minimum, RMT site personnel will take a break at least every two hours and drink plenty of non-alcoholic fluids if warm temperatures are encountered. An average of one quart per hour over a eight hour work day is recommended. Personnel experiencing nausea,

HOSPITAL ROUTING PLAN

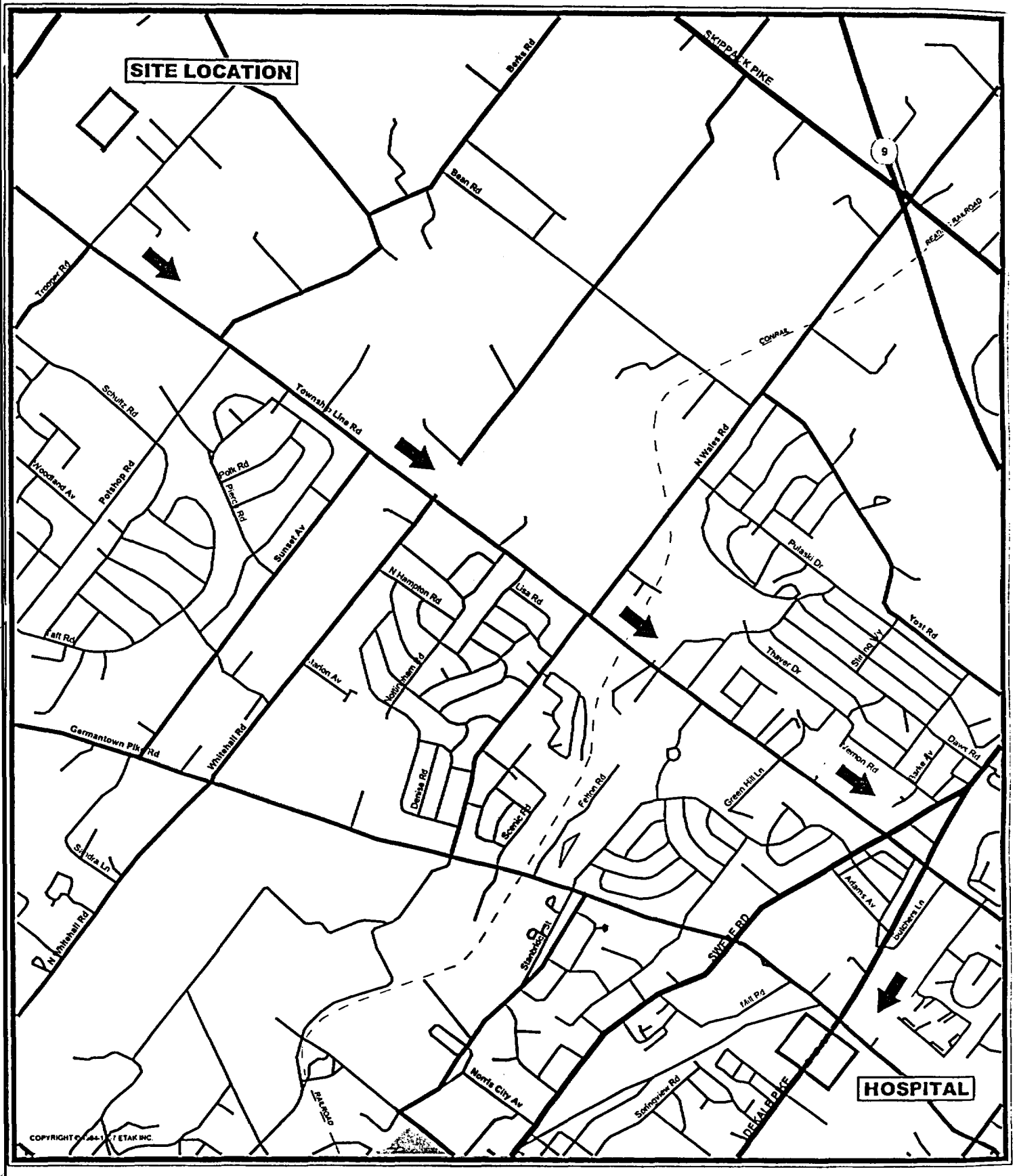

FIGURE HSP-3

dizziness, or any other common heat stress symptom should take a break immediately in a cool or shaded area and drink plenty of fluids. If symptoms are not alleviated, medical treatment should be sought.

- Cold stress incidents may be a health concern at the Site. If signs of hypothermia or frostbite, as described in Section 4.2.2, are seen, medical treatment should be sought.
- The uncontrolled release of chemical vapors or a fire that threatens site personnel or the public is clearly a worst case situation that should be anticipated. The most likely cause for evacuation is fire and/or explosion from a spark or chemical reaction, although some scenarios may also include uncontrolled releases of volatile vapors. The potential for fire and/or explosion is considered to be remote due to the non-volatile nature of suspected contaminants encountered during site investigations.

11.4 Evacuation Procedures

If conditions on-site result in situations that may warrant the evacuation of the surrounding population, the RMT Site Health and Safety Representative will notify the Schlumberger Emergency Coordinator and local emergency authorities. A determination will be made by these authorities on the need for evacuation. This Health and Safety Coordinator will provide input for this decision if requested.

The following chemical emergency information sources may be used for establishing procedures for site evacuation:

- Coast Guard Chemical Hazards Response Information System (CHRIS). This system consists of four manuals, a computer-assisted hazard-assessment system and Coast Guard technical assistance.
- CHEMTREC System, which has warning and guidance on over 3,600 items classed by chemical and trade name. CHEMTREC can be accessed through its emergency telephone number: 800/424-9300 (483-7616 in Washington, DC). Although the system is specifically oriented toward transport, it is a valuable repository of information for any incident of environmental degradation caused by a specific chemical agent, if known.

The hazards presented by hazardous materials may be either intensified or reduced by local conditions at the site. Weather conditions, fire (actual or potential) or other conditions may require modification of basic monitoring approaches. Such factors may impose additional restrictions on monitoring and cleanup operations by affecting the nature and rate of movement of materials within and beyond the immediate area, the toxicity and reactivity of hazardous substances and the monitor's mobility within the working area.

Wind increases the dispersal of toxic gases, powders and aerosols from the hazardous waste site. Therefore, steps will be taken to minimize the effect of wind dispersal as deemed necessary by the Health and Safety Representative.

Section 12
Personnel Training

Training is performed to make personnel:

- Aware of the hazardous aspects of work,
- Aware of the regulations and rules of conduct specific to on-site activities,
- Knowledgeable and comfortable with the safe operating procedures, work practices, and emergency actions established at the site, and
- Confident in knowing how to safely and effectively respond in emergency situations.

Therefore, the training program is a "preventive" measure, that if implemented and enforced, should help reduce employee injury, illness and accidents.

12.1 Pre-Entry Briefing

The site specific HSP will be reviewed with RMT personnel prior to their work on-site by the HSR. A health and safety briefing will be held by the HSR in the field prior to site work. Prior to the start of field activities, all subcontract personnel will be informed of the hazards and potential exposures related to the planned activities and the Health and Safety procedures to be followed by RMT on-site personnel. This HSP will be made available to subcontract personnel to assist them in developing their own Health and Safety Plan.

12.2 General Training Requirements

Each RMT employee at the Site shall have a valid certificate for 40-hour health and safety training as required under OSHA 1910.120, as well as having attended 8-hour annual refresher courses within less than a year.

Section 13
Medical Surveillance

A medical surveillance program has been established to identify, monitor, and minimize health risks for employees potentially exposed to hazardous materials. All field personnel participate in this program, which meets the requirements of OSHA 1910.120. This program includes baseline medical examinations to establish the individual's state of health, baseline physiological data, ability to wear personal protective equipment, and annual physicals.

The protocol for the yearly medical examination will include the following:

- Health history
- Vital signs and physical examination screen
- Pulmonary function
- Hematology survey
- Urinalysis
- Heavy metals screen
- Blood chemistry screen (SMA-20)
- Vision test
- Hearing test

The initial examination may include a maximal stress treadmill exercise test with a 12-point-lead EKG and chest x-ray, in addition to the above annual tests.

Personnel assigned to conduct on-site work tasks must have passed the required medical examination before entering either the contamination reduction or exclusion zone.

Whenever a situation occurs at a site which may pose a significantly increased health risk to any personnel, or personnel exhibit job-related health symptoms, the HSC may recommend that the individual consult with a physician for examination and treatment in accordance with good medical practice.

Section 14
Record Keeping

Logs and reports sufficient to document the implementation and execution of the personnel protection programs shall be maintained by the general contractor for all personnel involved in site activities. This documentation may include medical surveillance files, training files, daily logs and accident reports.

14.1 Medical Surveillance

Medical surveillance files for RMT site personnel are maintained in the RMT human resources department. These files document employee participation in the medical surveillance program and fitness to work on hazardous sites.

14.2 Training

Documentation of employee training is maintained in the Health and Safety files in the human resources department. These files document employee attendance, level of training and follow-up; or refresher instruction.

14.3 Work Logs

Daily work logs shall be maintained by the On-Site Coordinator. Copies of daily logs shall be forwarded to the Project Manager or the HSC on request. The daily log shall contain:

- Date,
- Area(s) or site(s) worked,
- List of employees by area and hours exposed,
- Personal protective equipment utilized by employees,
- Results of monitoring tests,
- Description of special or unusual events or incidents, including all first aid treatments not otherwise reportable.

Daily work logs shall be checked by the HSR. Any incident resulting in a work stoppage shall be fully documented in a report prepared by the HSR and submitted to the Project Manager.

14.4 Accident Reporting

In addition to descriptions in the daily log and work stoppage reports, any accident, chemical exposure, or "near-miss" incident shall be investigated, analyzed, and documented in an Incident Report submitted to the Project Manager and HSC. These reports, prepared by the HSR shall contain a full description and analysis of the incident.

First Report of Injury forms shall be completed in the event of an injury or illness.

Formal accident reports shall be prepared for any diagnosed illness or injuries that result in a lost work day or fatality. The accident report shall identify all contributing causes and recommend future hazard control measures to reduce the risk of recurrence.
Persons on site are responsible for reporting all injuries as soon as possible to the HSR.

EXHIBIT 5

INSURANCE REQUIREMENTS

CONTRACTOR represents that it now carries, shall maintain and keep in force at its own expense, with insurance companies acceptable to RMT, the following minimum insurance coverage during the duration of this AGREEMENT:

		MINIMUM LIMITS OF LIABILITY
A.	Worker's Compensation - Coverage A Employer's Liability - Coverage B	Statutory $500,000
B.	Commercial General Liability including: Explosion, collapse, and underground (XCU) Independent contractors Comprehensive form Premise/operations Contractual Personal injury Broad form property damage	
	Bodily Injury and Property Damage Combined	$2,000,000 each occurrence $2,000,000 in aggregate
	Personal Injury	$2,000,000 in aggregate
C.	Comprehensive Automobile Liability, including: Owned vehicles Hired vehicles Non-owned vehicles	
	Bodily Injury & Property Damage Combined	$1,000,000 each occurrence $1,000,000 in aggregate
D.	Excess Liability (umbrella form)	
	Bodily Injury and Property Damage Combined	$2,000,000 each occurrence $2,000,000 in aggregate

CONTRACTOR'S insurance companies must be rated by Best Ratings as an "A" or better carrier. **Insurance policies B, C, D and E as listed above, shall name RMT, Inc., as additional insured with respect to activities arising out of the performance of the service under this Agreement.** Liability coverage shall be primary to any insurance maintained by RMT.

Certificates of Insurance and Endorsements evidencing the above coverage shall be filed with RMT before CONTRACTOR commences any work hereunder.

CONTRACTOR SHALL CAUSE THE FOLLOWING CERTIFICATION TO BE INCLUDED ON EACH CERTIFICATE OF INSURANCE: "WE CERTIFY UNDER PENALTY OF LAW THAT THE INSURANCE COVERAGE EVIDENCED BY THIS CERTIFICATE MEETS ALL OF THE REQUIREMENTS OF THIS EXHIBIT OF THE AGREEMENT BETWEEN THE INSURED AND THE CERTIFICATE HOLDER.".

Such Certificates shall afford RMT thirty (30) days' written notice of cancellation or material change in coverage, and endorsements shall specifically confirm Contractual Liability Coverage for the indemnification clause in this Agreement and shall indicate that no act or default shall affect RMT'S right to recover under such policies in case of loss. In the event of cancellation or change of coverage, RMT shall have the right to obtain the required insurance, at CONTRACTOR'S expense, to the completion of the project. RMT reserves the right to review the actual policies of CONTRACTOR'S insurance coverages as listed above.

CONTRACTOR shall require each of its subcontractors to carry applicable insurance coverage with limits as set forth in this Exhibit, or shall cause CONTRACTOR'S own insurance policies to cover such subcontractors.

EXHIBIT 6

LIEN WAIVER FORM

WAIVER OF LIEN

To All Whom It May Concern:

WHEREAS, _____ has been employed by RMT, Inc. to furnish labor and materials for _____ under a contract dated _____ for the improvement of the premises described as _____ in the City of _____ County of _____ State of _____, of which _____ is the Owner.

NOW THEREFORE, this day of _____ 19__ for and in consideration of the sum of _____ dollars ($) in final payment for _____'s work under the aforementioned contract, the undersigned does hereby waive and release any lien right to, or claim of lien with respect to and on, said above-described premises, and the improvements thereon, on account of labor, services, materials, fixtures, apparatus, or machinery furnished by the undersigned to or for the above-described premises.

_____

By:

Name:

Title:

EXHIBIT 7

SCHEDULE OF WORK

PROPOSED SCHEDULE

DATE	DESCRIPTION
02/05/99	Return revised Contract and Specifications to RMT.
02/15/99	RMT delivers Specification to EPA.
03/01/99	CONTRACTOR sends Bid Documents and Specs to Subcontractors.
03/11/99	CONTRACTOR advertises Bid.
03/22/99	CONTRACTOR opens Bids.
03/23/99	CONTRACTOR award Bid.
03/24/99	Notice for Subcontractor to Proceed.
03/25/99	CONTRACTOR & Subcontractor start Work.
07/09/99	Subcontractor completes Work.

EXHIBIT 8

CONSTRUCTION QUALITY ASSURANCE PLAN

NORTH PENN AREA 12 SUPERFUND SITE
WORCESTER TOWNSHIP,
MONTGOMERY COUNTY, PENNSYLVANIA

CONSTRUCTION QUALITY ASSURANCE PLAN FOR:

NORTH PENN AREA 12
WATER MAIN EXTENSION

PREPARED FOR:

SCHLUMBERGER RESOURCE
MANAGEMENT SERVICES, INC.
(SCHLUMBERGER INDUSTRIES, INC.)

March 1999

Table of Contents

Section 1
Introduction

This Construction Quality Assurance Plan (CQAP) describes the quality assurance measures necessary to implement the construction of the water distribution main component of the Remedial Action (RA) for the North Penn Area 12 Superfund site. This CQAP was prepared in response to the Administrative Order for Remedial Design and Remedial Action (Order) by the United States Environmental Protection Agency (USEPA) under the authority of Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Section 9606(a).

In the context of this plan quality assurance refers to the actions, including visual observation, sampling, and testing undertaken or executed by the Resident Project Representative (RPR) to monitor, measure, and evaluate the characteristic(s) of materials and services provided by the Remedial Action Subcontractor, and to provide adequate confidence and documentation that construction substantially meets or exceeds the design requirements set forth by the project plans and specifications. Quality control refers to those actions, including construction techniques and equipment, scheduling, and staffing undertaken or executed by the Remedial Action Contractor and Subcontractor to ensure with adequate confidence that the construction materials and services being provided to the Respondents are substantially meeting or exceeding the design requirements set forth in the plans and specifications. This also includes the planned and systematic monitoring, measuring, and evaluation by the Remedial Action Contractor and Subcontractor of the material characteristic(s) and construction services being provided, and the means undertaken, if and when components are identified as not meeting design requirements.

1.1 General

This CQAP supplements the design requirements of the plans and specifications. Except for extraordinary conditions or circumstances, only site-specific addenda can supersede the design requirements: the requirements set forth herein may be amended, modified, or replaced with the written approval of the Respondents and USEPA. This CQAP defines the terms used, personnel requirements, roles and responsibilities of the involved parties, meeting schedules, documentation requirements, and problem definition/resolution procedures. This CQAP emphasizes careful documentation over the project's duration to confirm that the remedial action is implemented in accordance with the Administrative Order for Remedial Design and Remedial Action.

The work addressed in this CQAP is intended to facilitate proper construction of the Remedial Action (RA) components of the project. Any conflicts between the requirements of the CQAP and the design requirements should be brought to the attention of the RPR at the earliest possible date.

1.2 Purpose

The purposes of the CQAP include: 1) to ensure and document that proper construction techniques are used in executing the project; 2) to verify and document that construction (materials and installation techniques) conform to the plans and specifications. The CQAP culminates in a Remedial Action Construction Report.

1.3 Project Definition

The project includes the construction observation, testing and documentation of the expansion of the North Penn Water Authority (NPWA) water distribution main. Construction of lateral connections to bring public water service into the individual homes and businesses will be completed under a separate contract.

1.4 Parties

The parties discussed in this section are associated with the ownership, design, supply, manufacture, transportation, installation, and quality assurance of the water distribution main. The definitions, qualifications, and responsibilities of these parties are outlined in the following subsections.

1.4.1 Respondents

The Respondents are Schlumberger Industries Inc.; Fitz Waterwheel Company, Inc.; Morfontaine Properties; and Bernard Manuel (collectively Respondents). The Project Coordinator selected by the Respondents and approved by the USEPA will serve as the lead contact person with the regulatory agencies, Remedial Action Contractor and Remedial Action Subcontractor.

Respondents are responsible for the implementation of the RA under the Administrative Order for Remedial Design and Remedial Action by the USEPA. The Respondents select or approve the Remedial Action Contractor and Remedial Action Subcontractor, subject to review and approval of the USEPA. Respondents also obtain all permits and authorizations for off-site work, and shall comply with all applicable or relevant and appropriate requirements of federal and state environmental laws and regulations and the relevant guidance documents set forth in the Record of Decision (ROD).

1.4.2 Remedial Project Manager

The Remedial Project Manager is the USEPA's Project Coordinator, and has the authority to halt or redirect any work required in the Order and take any necessary response action when she/he determines that conditions at the site present an imminent and substantial endangerment to public health or welfare or the environment. Unless otherwise directed by the USEPA, all communications, whether written or oral, from the Respondents to USEPA shall be directed to the USEPA Remedial Project Manager.

1.4.3 Remedial Action Contractor

The Remedial Action Contractor is the firm and/or authority responsible for the preparation of the design and the oversight of construction for the RA. The Remedial Action Contractor shall appoint an individual, herein referred to as the Construction Manager (CM), who shall be their primary contact throughout the RA.

The Remedial Action Contractor is responsible for performing the engineering design and preparing the associated drawings and specifications for the RA. The CM is responsible for approving all design and specification changes and making design clarifications necessitated during construction of the RA.

The CM shall be familiar with the design of public water supply systems and with all applicable regulatory requirements.

The Respondents have selected, and the USEPA has approved, RMT, Inc. (RMT) as the Remedial Action Contractor for the RA. RMT has appointed Mr. Wally Kurzeja as the CM for the RA.

1.4.4 Remedial Action Subcontractor

The Remedial Action Subcontractor is the firm responsible for the means and methods used, except as specifically called out in the Contract, for the construction of the RA. The Remedial Action Subcontractor shall supply all equipment, materials, and personnel necessary to complete the RA in a timely and orderly manner as agreed to in the Contract. Other specific duties of the Remedial Action Subcontractor are as follows:

1. Provides a Superintendent who shall represent the Remedial Action Subcontractor at all site meetings and shall be responsible for the Remedial Action Subcontractor's field crew throughout the RA.
2. Provides RPR safe and responsible access to all aspects of construction for the scope of work outlined in this document.
3. Informs the RPR when portions of the RA are ready for evaluation and testing.

The Remedial Action Subcontractor shall be knowledgeable in the construction of water system or sewer projects and has the financial capability, past experience, equipment, and personnel required to complete the RA.

The Respondents have selected, and the USEPA has approved, North Penn Water Authority (NPWA) as the Remedial Action Subcontractor for the water distribution main portion of the RA.

1.4.5 Resident Project Representative

The Resident Project Representative (RPR) is the official designated/appointed field representative of the CM; in this document the term Resident Project Representative shall apply equally to "Construction Coordinator" (*i.e.*, the individual responsible for coordinating construction, quality control and assurance activities for the project).

The RPR is responsible for all construction quality assurance activities and the proper resolution of all quality assurance issues that arise during construction. The RPR will serve as the on-site contact person with the regulatory agencies during the absence of the Project Coordinator. The CM shall notify the USEPA if project specifications or CQAP procedures cannot be met and alternatives which require regulatory interaction are proposed.

The selection of the RPR is the direct responsibility of the CM. Qualifications for this position include familiarity with the following: quality control and assurance programs for environmental projects; general earthwork and/or civil and sanitary construction techniques; all applicable regulatory requirements, and material submittals.

The specific duties of the RPR are as follows:

1. Serves as a liaison between all parties involved in the project to ensure that communications are maintained.
2. Attends quality assurance related meetings, including pre-construction, daily, weekly, and problem/work deficiency meetings as necessary and previously approved by the CM.
3. Reviews all design drawings and specifications and the revisions thereof issued by the CM.
4. Reviews shop drawings of materials and equipment to be used during construction for conformance to the plans and specifications.
5. Performs on-site inspections of the work to assess compliance with project standards and the CQAP.

6. Monitors, logs, photographs and/or documents all remedial action component construction and installation operations.
7. Examines and tests various materials, procedures, and equipment during implementation of the construction activities.
8. Monitors the following operations for the RA:
    a) Material delivery.
    b) Unloading and on-site transport and storage.
    c) Sampling and conformance testing.
    d) Construction activities and private well abandonment.
    e) Condition of the soil components as placed.
    f) Sampling and field testing of the finished components.
    g) Repairs or replacement if and when necessary.
9. Prepares daily field reports summarizing the daily RA efforts as specified in Section 2.1 of the CQAP.
10. Documents any on-site activities that could result in damage to the water distribution main and brings this information to the Remedial Action Subcontractor's and CM's attention.
11. Prepares a weekly summary of the water distribution main and all quality assurance activities.
12. Assists in the selection of the quality assurance laboratory.
13. Reviews the results of laboratory testing and makes appropriate recommendations.

1.4.6 Independent Quality Assurance Team

An Independent Quality Assurance Team (IQAT) is not required for the water distribution main portion of the RA. NPWA will take ownership of the water main after construction. NPWA will perform the construction with oversight and documentation by the CM and RPR.

1.4.7 Soils Quality Assurance Laboratory

The Soils Quality Assurance Laboratory (SQAL) is a firm responsible for conducting tests on soil samples taken from the site. The SQAL is responsible for conducting the appropriate laboratory tests, in accordance with the CQAP, as directed by the RPR.

The SQAL shall be approved by the Respondents. The SQAL shall have properly maintained and periodically calibrated appropriate testing equipment. The SQAL shall also ensure that laboratory soil testing is performed by personnel with experience

and/or training in soil testing fundamentals. The laboratory personnel shall be familiar with the American Society for Testing Materials (ASTM), American Association of State Highway and Transportation Officials (AASHTO), U.S. Army Corps of Engineers (COE) and other applicable test standards. The SQAL shall be capable of providing test results within the project deadlines throughout the construction phase of the project.

The SQAL shall submit all test results within the project deadlines to the RPR or CM. Soil test results shall be provided by fax to the RPR or CM as soon as possible after test completion. Written test results shall be in a format approved by the RPR and include references to the standard method used.

1.5 Communications

To guarantee a high degree of quality during construction and assure a final product that meets all project specifications, clear, open channel of communications are essential. This section discusses appropriate lines of communication and describes all necessary meetings.

The lines of communication required for this portion of the RA are illustrated in Figure 1 of Section 4.

1.5.1 Pre-Construction Meeting

A pre-construction meeting shall be held at the site prior to beginning of the project. The meeting shall be attended by the CM, the Remedial Action Subcontractor, the representatives of the regulatory agencies (USEPA), and the Project Coordinator.

Specific topics considered for this meeting include review of the project CQAP for problems, deficiencies, and/or additions, and a review of the responsibilities of each party. A meeting agenda with specific topics for the pre-construction shall be developed and distributed by the CM. The meeting shall be documented by the CM, and minutes shall be transmitted to all parties.

1.5.2 Progress Meetings

Progress meetings will be held weekly at a time and place to be designated by the CM and be attended by, at a minimum, the CM, the Remedial Action Subcontractor, and the RPR. The meeting's purposes are:

1. Review progress of construction and compare same to schedule.
2. Coordinate work for the upcoming week.

3. Review progress of QA/QC program and identify any areas or conditions requiring reconsideration.
4. Identify any problem areas such as work deficiencies, work conflicts, or situations/conditions materially affecting work.
5. Potential modifications to either the construction or QA/QC programs which would improve the final work product.
6. Health and safety procedures/monitoring.

1.5.3 Daily meetings

If necessary, the RPR and Remedial Action Subcontractor shall meet occasionally prior to the start of work to coordinate the day's activities and review the status of any pending issues. The meeting shall be documented in the RPR's daily report, and shall generally address the following relative to that day's work:

1. General (all parties):
    a. Overview the previous day's activities, accomplishments, and problems or difficulties.
    b. Solution or remedy of any outstanding problem or difficulties.
    c. Update and amendment of the work schedule.
    d. Coordination of activities.
    e. Review health and safety precautions.
2. Remedial Action Subcontractor:
    a. Planned work activities and work locations.
    b. Solution or remedy of any outstanding problem or difficulties.
3. RPR:
    a. Resolution or moderation of problem(s).

1.5.4 Problem or Work Deficiency Meeting

The RPR, with approval of the CM, may at any time convene a special meeting to address a work problem or deficiency. At a minimum, the meeting shall be attended by the Remedial Action Subcontractor, Project Coordinator, and RPR. Additionally, the RPR may include any other person or party to the meeting agenda, such as the CM, if he/she deems appropriate. The purpose of the meeting is to define and resolve the problem or work deficiency as follows:

1. Define and discuss the problem or deficiency.
2. Review alternative solutions.
3. Implement an action plan to resolve the problem or deficiency.

The meeting shall be documented by the RPR, CM, or designee, and minutes distributed to all participants.

Section 2
Documentation

The documentation of the CQAP activities will support a judgment of whether construction activities have been carried out in accordance with the approved engineering plans and specifications. The documentation process includes recognition of construction tasks that should be observed and documented; assignment of responsibilities for the observation, testing, and documentation of these tasks, and the completion of the required reports, data sheets, forms, and check lists to provide an accurate record of the work performed during construction.

The RPR shall provide the CM with completed and signed reports, data sheets, forms and checklists, as described below, to document that all CQAP requirements have been satisfied.

2.1 Daily Observation Reports

The RPR shall complete a daily report and/or logs on prescribed forms outlining the monitoring activities for that day. The reports will contain, at a minimum, the following information:

1. Date, project name, location, and the number and names of people on-site.
2. Time work starts and ends, in addition to the time of work stoppages related to inclement weather or insufficient equipment or personnel.
3. Data on weather conditions, including temperature, humidity, wind direction and speed, cloud cover, and precipitation.
4. Remedial Action Subcontractor's work force, equipment, and materials delivered to or removed from the job site.
5. Chronological description of work in progress, including notices to or requested from the Remedial Action Subcontractor.
6. Results of testing performed on-site by quality assurance personnel.
7. Problem/Deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this plans.
8. A listing of samples collected, marked, and delivered to the CQA Laboratory.
9. A record of communications with other on-site parties, outside companies, regulatory agencies, or consultants regarding the day's construction activities.
10. A record of calibrations or standardization's performed on field testing equipment, including actions related to and results of re-calibrations.

A summary of all supporting data sheets along with final testing results and RPR's approval of the work shall be required upon completion of construction.

The RPR shall prepare a deficiency report whenever problems and/or deficiencies are encountered during construction (*e.g.*, when construction material or activity is observed or tested that does not meet the requirements set forth in this plan). The deficiency reports will be cross-referenced to reports, data sheets, forms, and check lists, that contain data or observations leading to the determination of a problem or deficiency, and shall contain at a minimum the following information:

1. Description of the problems or deficiency, including reference to data or observations related to the determination of the problem or deficiency.
2. Location of the problem or deficiency, including how and when the problem or deficiency was discovered.
3. Recommended corrective action for resolving the problem or deficiency. If the corrective action has already been implemented, then documentation showing that the problem or deficiency was resolved should be included.

The RPR and CM shall determine if the problem or deficiency is an indication of a situation that might require changes to the plans and specifications and/or the CQAP. If this situation develops, a meeting will be held with the appropriate people on site, including the CM, to determine if revisions to the plans or specifications and/or this CQAP should be made. Revisions to the plans or specifications and/or CQAP must be approved by the CM.

2.2 Photographic Documentation

Photographs will be taken by the RPR to document observations, problems, deficiencies, and work in progress. Photographs will be in color print format and will be filed in chronological order in a permanent protective file by the RPR.

The following shall be documented in the daily observation report or a log book for each photograph:

1. Date and time.
2. Location where photograph was taken, including nearest street address.
3. Directional view (e.g., N, S, E, W, NW, etc.) of photograph.
4. Description of the subject matter.

2.3 Audiovisual Tape Documentation

Separate audiovisual tape recordings of pre-construction and post-construction site conditions shall be submitted by the Remedial Action Subcontractor to the CM to document landscape restoration activities performed during this component of the RA. The original and one copy of each recording shall be submitted to the CM. The audio-video recordings shall be performed in accordance with the RA specifications.

2.4 Test Reports

Records of all testing performed on the components of the water distribution main, shall be collated by the RPR on prescribed forms. A summary list of test results shall be prepared by the RPR on an ongoing basis and submitted with the weekly progress reports.

2.5 Progress Reports

Weekly progress reports shall be prepared by the RPR and submitted to the CM. These reports shall include the following information:

1. Overview of the progress to date.
2. Description of any changes made to the plans, drawings, or specifications.
3. Description of any problems or deficiencies in installation at the site, including any actions implemented to remedy those deficiencies.
4. Summary of activities anticipated for the next reporting period.
5. Daily observation reports for the past week (as an attachment).

2.6 Remedial Action Construction Report

A Remedial Action Construction Report will be assembled by the RPR at the end of construction. The Remedial Action Construction Report will contain the following information:

1. Parties and personnel involved with the project.
2. Scope of work.
3. Narrative of the project (detailed chronologically).
4. Quality assurance methods.
5. Record drawings showing the installation of the public water supply system, water system connections, and private well abandonment details.
6. Photographic documentation of all major activities.
7. A summary of the field observations performed, laboratory samples collected, and test results reported.
8. A summary of problems and deficiencies encountered during construction that incorporated engineering design modifications as part of the solution.
9. Deviations from the approved plans and specifications.
10. Documentation that acceptance criteria were met in accordance with the plans and specifications and the requirements of the CQAP.
11. Written correspondence with the USEPA and other regulatory agencies.

Section 3
Water Main Installation

3.1 Description

Water main installation shall consist of trenching and excavating and the laying of water main of various sizes, installation of valves and valve boxes, installation of fire hydrant assemblies, and all fittings and appurtenances associated with the construction of the water main and service connections. Water main installation shall also include all restoration of State, Township and Borough roads, landscaping, seeding and sodding, repair of driveways and culverts, and all other items necessary to restore the project site to its original condition or as otherwise noted on the drawings.

3.2 Quality Control Documentation

Prior to the installation of the water main, the Remedial Action Subcontractor shall submit shop drawings of all materials and equipment to be installed to the CM. The pipe, valve, or fitting manufacturer shall provide a letter certifying that the pipe, valves, or fittings are provided in compliance with the specifications. All piping and fittings delivered to the project shall be clearly marked with the manufacturer's name, type of pipe, and pipe class. The RPR shall verify that all shipped piping and fittings have the appropriate labeling and the condition of the piping and fittings.

Prior to construction, tests to confirm the adequacy of the granular materials or stone used for bedding and backfill shall be performed on specimens procured from each source area. All soil evaluation tests are to be performed in the SQAL. The Remedial Action Subcontractor shall provide samples to the RPR for submittal to the SQAL.

3.3 Construction Observation and Documentation

The RPR shall observe the procedures used by the Remedial Action Subcontractor during the installation of the water main and site restoration to ensure that all work is performed in accordance with the approved plans, specifications, and CQAP.

3.4 Quality Control Procedures and Testing

All water distribution pipe shall be pressure tested to determine the integrity of the joints. Piping shall be subject to a pressure test performed by the Remedial Action Subcontractor and

witnessed by the RPR. Piping shall remain leak-free after being subject to a minimum pressure of 150 pounds per square inch (psi) for four (4) hours.

The following information shall be recorded:

1. Date and time of the start and finish of the test.
2. Name of the person conducting the test and person observing.
3. Initial pressure reading.
4. Final pressure reading.
5. Location (segment of the system) of the water main tested.
6. Size and length of the pipe tested.
7. Any pertinent remarks.

Chlorine tablets shall be placed inside of each piece of installed pipe per the schedule noted in the specifications. The RPR shall document that the required number of tablets are placed inside each pipe. After the pipe has been installed and meets the pressure testing requirements, the water main shall be filled with water for a minimum of 24 hours. The piping shall then be thoroughly cleaned and flushed prior to use. After the piping has been flushed and when the residual chlorine level is below 1 part per million (ppm) the RPR shall obtain a sample of the water for bacterial analysis by the Remedial Action Subcontractor. The sample date and location shall be documented and segment of the water system sampled identified. The sample shall meet drinking water standards for bacteria which is less than one coliform per 100 milliliters (ml).

3.5 Construction Testing

3.5.1 Field Testing

All quality assurance testing shall be conducted in accordance with the project specifications, or as directed by the RPR. The RPR shall perform the following nuclear density tests on the water main bedding and granular backfill under roads and paved areas.

1. Field Moisture Content.
2. Field Density (ASTM D2922).

At least one test shall be completed to verify the Remedial Action Subcontractor's compaction techniques.

3.5.2 Laboratory Testing

The following tests shall be completed on bedding material and granular backfill to determine the adequacy of compaction.

1. Moisture Content (ASTM D2216).
2. Modified Proctor (ASTM D1557).

The Remedial Action Subcontractor shall submit two samples of bedding material and granular fill for each source used to the RPR for testing by the SQAL. If bedding material or granular fill characteristics change during the project additional samples shall be provided by the Remedial Action Subcontractor for analysis as requested by the RPR.

The Remedial Action Subcontractor shall complete bacteriological testing of water samples to determine the adequacy of the disinfecting procedure. The bacteriological tests shall be completed in accordance with North Penn Water Authority standards.

3.6 Deficiencies and Repairs

The RPR shall evaluate Remedial Action Subcontractor's compaction techniques for their compliance with the specifications and CQAP. If deficiencies are observed, the RPR shall determine the nature and extent of the deficiencies and shall notify the Remedial Action Subcontractor. The Remedial Action Subcontractor shall correct all deficiencies and the RPR shall document that compaction has been achieved in accordance with the specifications and CQAP.

All water main which does not meet the pressure test shall have the joints carefully inspected for leaks and repaired where necessary. Any pipe or casting found to be cracked shall be removed and replaced with new pieces by the Remedial Action Subcontractor. After this work has been done the pressure test shall be repeated. Final acceptance of the lines will not be made until satisfactory tests have been passed.

Bedding material and granular fill which does not meet the requirements of the specifications shall not be used.

Sections of pipe which do not meet the bacteriological requirements of the Remedial Action Subcontractor shall be re-chlorinated and re-sampled until the test meets the specifications.

Section 4
Figures

Figure 1

LINES OF COMMUNICATION

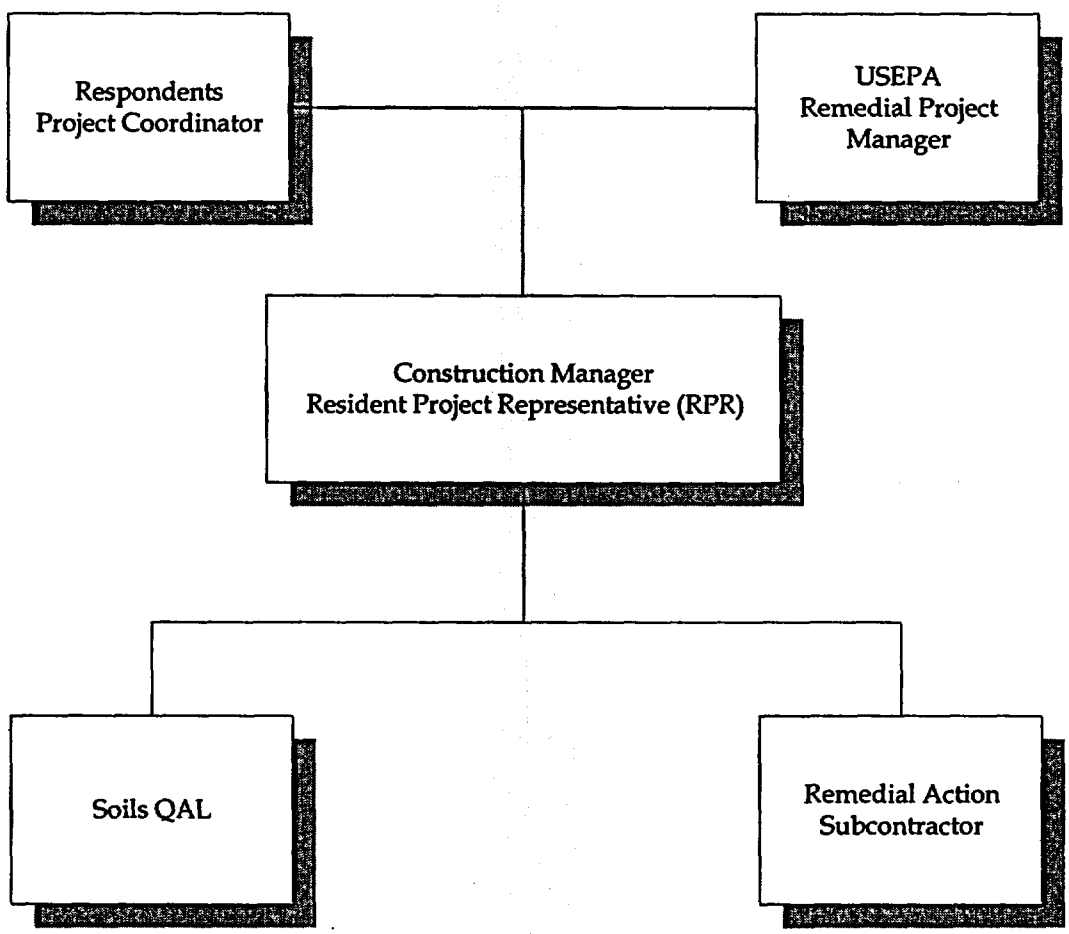

EXHIBIT 9

NORTH PENN WATER AUTHORITY
SUBCONTRACTOR AGREEMENT

CONTRACT DOCUMENTS

FOR

WATER MAIN INSTALLATION IN
WORCESTER TOWNSHIP

TO THE

NORTH PENN WATER AUTHORITY

BID DATE

MARCH 22, 1999

NORTH PENN WATER AUTHORITY
300 FORTY FOOT ROAD
TOWAMENCIN TOWNSHIP
LANSDALE, PA 19446

CONTRACT NO. 397

GENERAL SPECIFICATIONS

1.01. GENERAL Proposals for the furnishing of INSTALLATION OF WATER MAIN IN WORCESTER TOWNSHIP for NORTH PENN WATER AUTHORITY will be received up to 3:00 p.m., Local Prevailing Time, March 22, 1999 at the Authority's Operations Center, 300 Forty Foot Road, Towamencin Township, Lansdale, PA 19446, at which time they will be publicly opened and read.

The term "AUTHORITY" as used herein refers to the North Penn Water Authority, P.O. Box 1659, 300 Forty Foot Road, Lansdale, PA 19446.

The term "CONTRACTOR" as used herein refers to the individual, firm, partnership, co-partnership, or corporation who is mentioned as such in the Agreement as the party to perform the work under the Contract or the Surety, in case of default.

The term "CONSTRUCTION MANAGER" as used herein refers to RMT, Inc., 1143 Highland Avenue, Ann Arbor, MI.

The "Contract Documents" consist of the "Notice to Bidders", "Proposal", "Agreement", "General Specifications", "Detailed Specifications", "Bid Bond", "Performance Bond", "Prevailing Wage Determination", and "Addenda" (if any), including ALL modifications thereof incorporated in the documents before their execution. These form the Contract, together with those items specified in the Agreement.

1.02. PREPARATION OF PROPOSAL Proposal must be submitted on the form provided in these Contract Documents, and must not be removed from the Documents. **Proposals must be submitted in a sealed envelope bearing on the outside the name of the Bidder and his address, and shall be clearly marked: "PROPOSAL FOR WATER MAIN INSTALLATION IN WORCESTER TOWNSHIP."**

If forwarded by mail, the sealed envelope containing the proposal and marked as designated above, must be enclosed in another envelope addressed as indicated in paragraph 1.01. The original proposal must be submitted to the NORTH PENN WATER AUTHORITY at the address shown above, with a priced copy to RMT, INC. at the address shown above.

1.03. INTENT It is the intent and purpose of these Specifications to prescribe the WATER MAIN INSTALLATION IN WORCESTER TOWNSHIP required by the North Penn Water Authority for the installation of water main at North Penn Area 12, Worcester Township. The AUTHORITY reserves the right to make changes in quantities listed. The estimated quantities provided in the bid documents will be utilized as a basis to determine the low bidder.

1.04. DURATION OF CONTRACT The CONTRACTOR will commence work on the project within thirty (30) days of contract authorization. CONTRACTOR will diligently pursue the specified work, and complete all work within ninety (90) construction days with the total contract not to exceed one hundred and twenty (120) calendar days after Contract authorization. A construction day is defined as any day Monday through Saturday in which the contractor can work unimpeded by severe or adverse weather. Severe or adverse weather is considered to be any atmospheric condition at a definite time and place that is unfavorable to construction activity. The determination that severe or adverse weather has occurred does not automatically mean the contractor receives a time extension. Analysis of the contractors progress schedule would be conducted to determine if the severe weather delayed contract completion. If it is found that unusually severe weather delayed the contract modifications will be made accordingly.

If the work specified in this Agreement is not completed within 120 calendar days , due to causes under the control and responsibility of CONTRACTOR, CONTRACTOR shall pay Twenty-Seven Thousand, Five Hundred Dollars ($27,500) per day in liquidated damages to RMT, Inc., 1143 Highland Drive, Ann Arbor, MI, the CONSTRUCTION MANAGER. CONTRACTOR and CONSTRUCTION MANAGER agree that in the event of CONTRACTOR'S breach of this Agreement by failure to complete the Work hereunder, by the date set forth above, the actual damages to be sustained by CONSTRUCTION MANAGER would be impracticable or extremely difficult to ascertain, and that daily liquidated damages set forth above are reasonable under the circumstances existing at the time this Agreement is made. This remedy is not to be construed as a limitation of remedy for any other breach of this Agreement.

For each construction day under ninety (90) construction days that the work specified in the Contract Documents is completed and approved by the AUTHORITY and CONSTRUCTION MANAGER, CONTRACTOR will be awarded one thousand dollars ($1000).

1.05. WITHDRAWAL OF PROPOSALS Permission will not be given for the withdrawal of any bids for a period of sixty (60) days after the scheduled date for the opening of bids. All Bidders specifically waive any right to withdraw a Proposal after it has been submitted to the AUTHORITY, except as herein provided. A Bidder may withdraw a Proposal prior to the date and time for opening of Proposals if a written request to withdraw the Proposal is delivered to the AUTHORITY by an accredited representative of the Bidder or by U.S. Mail, and is actually received by the AUTHORITY prior to the time set for the opening of Proposals

1.06. AWARDING The AUTHORITY reserves the right to accept or reject any or all proposals, or any parts thereof or items therein, and to waive technicalities, as may to be deemed to be in the best interest of the AUTHORITY AND/OR CONSTRUCTION MANAGER. The AUTHORITY will award WATER MAIN INSTALLATION contracts to the lowest responsible Bidders. If the lowest responsible Bidder is unable to perform in a timely manner, or if work by the lowest possible Bidder fails to comply with AUTHORITY'S standards, Owner, at its discretion, reserves the right to award said work to the second, or third lowest Bidder.

1.07. BONDS CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the contract Price as security for the faithful performance and payment of all CONTRACTOR'S obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements, CONTRACTOR shall within ten (10) days thereafter substitute another Bond and surety, both of which must be acceptable to AUTHORITY.

1.08. PROPOSAL SECURITY Each Proposal must be accompanied by a Bid Bond of twenty percent (20%) of the bid, issued to AUTHORITY, shall be submitted with the Proposal.

All Bid Bonds, except those of the three (3) low Bidders, will be returned within three (3) days following the date of the award of the Contract. The Bid Bonds of the three low Bidders will be retained by the AUTHORITY until the Contract has been signed by the lowest Bidder.

1.09. INSURANCE CERTIFICATES REQUIRED The following insurance certificates in a form, and with a company satisfactory to AUTHORITY AND CONSTRUCTION MANAGER, in the amounts stipulated in Exhibit 6 of the specifications , must be submitted to the AUTHORITY AND CONSTRUCTION MANAGER at the time of the execution of the Contract. North Penn Water Authority and RMT, Inc. must be named as additional insured parties on all policies.

1.10. PREVAILING WAGE DETERMINATION The Prevailing Wage Act and its regulations require that the prevailing minimum wage rates, as determined by the Secretary of Labor and Industry, shall be incorporated into any specifications and contracts for public work. "Public work" means construction, reconstruction, demolition, alteration and/or repair work other than maintenance work, done under contract and paid for in whole or part out of the funds of a public body where the estimated cost of the total project is in excess of twenty-five thousand dollars ($25,000). "Public body" means the Commonwealth of Pennsylvania, and any of its political subdivisions, any authority created by the General Assembly of the Commonwealth of Pennsylvania and any instrumentality or agency of the Commonwealth of Pennsylvania. These prevailing minimum wage rates shall be in effect during the entire period of the Contract.

1.11. QUALIFICATIONS AND DISQUALIFICATION OF BIDDERS Bidder shall submit, along with the proposal, an experience statement, giving information as to work completed by CONTRACTOR.

The AUTHORITY reserves the right to reject any bid if the evidence submitted by investigation of such Bidder, fails to satisfy the AUTHORITY that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein, but failure to reject shall not be considered proof of such Bidder's Qualifications.

1.12. COLLUSION More than one Proposal from an individual, firm, partnership, corporation, or an association, under the same or different names shall not be considered. Reasonable grounds for believing the Bidder is interested in more than one Proposal for the work contemplated will cause the rejection of all Proposals to which such Bidder is interested. Any, or all Proposals, will be rejected if there is reason for believing that collusion exists among the Bidders, and all participants in such collusion will not be considered in future Proposals for the same work. Proposals in which the prices are obviously unbalanced will be rejected.

1.13. RIGHT TO REJECT PROPOSALS The unqualified right is reserved by the AUTHORITY to reject any and all bids, to waive any informality in bids received, and to accept or reject any or all items of any bid, as may be deemed to be in the best interest of the AUTHORITY AND/OR CONSTRUCTION MANAGER. The decision of the AUTHORITY as to the Bidder, or Bidders selected will be conclusive. Conditional bids will not be accepted.

Proposals which contain any omissions, erasures, alterations, additions not called for, or irregularities of any kind, or Proposals which are not accompanied by bid security as required by Item 1.07, hereof, may be rejected as not in proper form.

1.14. FORFEITURE OF PROPOSAL SECURITY In the case of failure, or neglect by the successful Bidder to sign the Contract and furnish the bonds or certified checks required within the time stipulated, said Bidder will be considered as having abandoned the Contract, and to be in default to the AUTHORITY. The Bidder, upon default, shall forfeit all right to the return of his bid bond, or certified check. The

monies will be retained by the AUTHORITY as liquidated damages, which shall not be considered a penalty. The AUTHORITY shall have no further obligation, or liability hereunder, and thereupon, the work may be let to the next lowest responsible Bidder, and so on, until the Contract is accepted and executed.

1.15. WORKER'S COMPENSATION ACT The CONTRACTOR shall accept, insofar as the work covered by this Contract is concerned, the provisions of the Pennsylvania Worker's Compensation Act of 1915 and any supplements or amendments thereto, including any which may hereafter be passed. CONTRACTOR shall insure his/her liability hereunder, or file with the Engineer a certificate of exemption from insurance from the Bureau of Worker's Compensation of the Department of Labor and Industry. All contracts with sub-CONTRACTOR'S shall contain the obligation given above insuring that they likewise will be bound in like manner.

1.16. OBSERVANCE OF LAWS The CONTRACTOR, at all times, shall observe and comply with all Federal and State Laws, and local ordinances and regulations, including OSHA regulations, which in any manner affect the conduct of the work, and all such orders or decrees as exist at present, and those which may be enacted later by bodies or tribunals having any jurisdiction or authority over the work. The CONTRACTOR shall indemnify and hold harmless AUTHORITY AND CONSTRUCTION MANAGER and their respective officers, agents and servants against any claim or liability arising from, or based upon the violation of any such law, ordinance, regulation, order or decree, whether by himself/herself or his/her employees.

1.17. PROPOSAL PRICES All rates listed in the PROPOSAL for placed material shall include all CONTRACTOR'S overhead expenses, insurance and profit.

1.18. QUANTITIES This is a lump sum bid. The estimated quantities as given in the Proposal are to serve only as a basis for comparison of bids. The AUTHORITY AND CONSTRUCTION do not expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any item of work as may be deemed necessary by the AUTHORITY.

1.19. TERMINATION OF CONTRACT AUTHORITY AND CONSTRUCTION MANAGER reserves the right to terminate the Contract or Contracts at any time during the Contract period, should the CONTRACTOR fail to comply with any stipulation of the Contract. The contract may be terminated by the AUTHORITY AND CONSTRUCTION MANAGER if the CONTRACTOR fails to complete work orders within 30 days of receipt. Work may be given to the second, or third lowest Bidder if the low bid CONTRACTOR cannot complete the work assigned in 30 days.

1.20. PAYMENT Progress payments shall be made to CONTRACTOR based upon a percentage complete basis. Unit rates submitted as part of the bid will be utilized as the basis to compensate the CONTRACTOR when actual engineering field measurements deviate from the CONSTRUCTION MANAGER'S estimated quantities by greater than 20% Additional compensation or deductions will be made on those quantities greater than 120% or less than 80% of the estimated quantity.

1.21. TAX EXEMPTION North Penn Water Authority is exempt from Federal and Pennsylvania State Tax. Exemption certifications will be furnished to the successful Bidder.

1.22. WORKMANSHIP All work will be in a neat, clean, and workmanlike manner. The CONTRACTOR will exercise caution to prevent damage to surrounding facilities or landscape. If excessive or negligent damage occurs, it is the CONTRACTOR'S responsibility to repair damage to the individual satisfaction of the property owner and AUTHORITY AND CONSTRUCTION MANAGER. Trucks and heavy equipment will be kept off lawn areas. Any ruts or turf damage outside the work area will be promptly repaired by the CONTRACTOR.

1.23. GUARANTEE The CONTRACTOR shall guarantee the work and material for a period of one (1) year from the date of completion and acceptance. If any material or workmanship proves to be defective within one (1) year, it shall be repaired by the CONTRACTOR, at his expense.

1.24. SUB-CONTRACT All bidders must furnish names(s) of all sub-contractors that will be used on this project. This list shall be included with the bid submitted and become part of the bid documents.

1.25. EXECUTION OF CONTRACT The time of opening and reading of the bids is stated in the "Notice to Bidders". Upon decision of AUTHORITY as to the successful bidder, the bidder shall receive formal notification to that effect, and shall attend the office of the AUTHORITY within five (5) days of notification by the AUTHORITY to sign the formal contract and furnish the bonds required.

1.26 INDEMNIFICATION CONTRACTOR'S obligation to indemnify and hold harmless AUTHORITY in Article V of the Agreement (Contract No. 397 attached hereto) is hereby amended to apply jointly and severally to AUTHORITY and/or CONSTRUCTION MANAGER.

PROPOSAL

TO: NORTH PENN WATER AUTHORITY
FOR: WATER MAIN INSTALLATION TO NORTH PENN WATER AUTHORITY

Pursuant to and in compliance with your advertisement for WATER MAIN INSTALLATION IN WORCESTER TOWNSHIP, the undersigned hereby offers to provide WATER MAIN INSTALLATION IN WORCESTER TOWNSHIP to North Penn Water Authority in strict accordance with the Contract Documents as defined in the specifications for the prices named in the following schedules:

1 TOTAL LUMP SUM CONTRACT PRICE

Lump Sum (Use Figures) $_____

Lump Sum (Use Words) _____

In addition, in the event that additional work is required on the project above and beyond the scope of the contract documents and specifications, or the estimated quantities are exceeded by 20% the BIDDER shall perform the work for the following installed prices:

Quantity	Item	Unit Price	Units	Installed Cost
3070	16" D.I.P. T.J.		PER LF	$
6698	12" D.I.P. T.J.		PER LF	$
11569	8" D.I.P. T.J.		PER LF	$
250	6" D.I.P. T.J.		PER LF	$
50	VALVE BOX LID		EACH	$
50	VALVE BOX TOP		EACH	$
50	VALVE BOX BOTTOM		EACH	$
15	8" GATE VALVE M.J.		EACH	$
25	6" GATE VALVE M.J.		EACH	$
4	16" X 6" F.H. TEE M.J.		EACH	$
4	16" BUTTERFLY VALVE M.J.		EACH	$
6	12" X 6" ANCH TEE M.J.		EACH	$
5	12" BUTTERFLY VALVE M.J.		EACH	$
14	8" X 6" ANCH. TEE M.J.		EACH	$
4	12" - 45 BEND M.J.		EACH	$
1	12" - 90 BEND M.J.		EACH	$
2	8" - 45 BEND M.J.		EACH	$
2	16" X 12" TEE M.J.		EACH	$
2	12" X 8" TEE M.J.		EACH	$
1	12" X 12" TEE M.J.		EACH	$
2	16" -45 BEND M.J.		EACH	$
4	8" X 8" TEE M.J.		EACH	$
1	8" X 6" REDUCER M.J.		EACH	$
2	16" X 12" REDUCER M.J.		EACH	$
1	12" X 8" REDUCER M.J.		EACH	$
1	8" X 6" REDUCER M.J.		EACH	$
1	16" PLUG		EACH	$
1	12" PLUG		EACH	$
1	8" PLUG		EACH	$
1	16"X 8" TAPPING SLEEVE M.J.		EACH	$
1	8" TAPPING SLEEVE M.J.		EACH	$
1	8" 90 BEND M.J.		EACH	$
25	FIRE HYDRANTS		EACH	$
	2A MODIFIED STONE/FILL.		EACH	$
	TOWNSHIP ROAD RESTORATION/YD²		EACH	$
	STATE HIGHWAY RESTORATION /YD²		EACH	$
53	SHORT SIDE SERVICE INSTALLATION DIRT BACKFILL		EACH	$
71	LONG SIDE SERVICE INSTALLATION STONE BACKFILL W/BLACKTOP RESTORATION		EACH	$

Restoration costs for additional work will be handled as an additional cost to the unit rates above.

EXCEPTIONS: _____

COMPANY: _____ SIGNATURE: _____

ADDRESS: _____ TITLE: _____

_____ PHONE: _____

DATE: _____ FAX: _____

AGREEMENT

THIS AGREEMENT, made this day of 19 , between NORTH PENN WATER AUTHORITY, Lansdale, PA, hereinafter called the AUTHORITY, Party of the First Part, and a

CORPORATION know as _____, existing under the laws of the State of _____;

A PARTNERSHIP known as _____, consisting of the following members _____;

AN INDIVIDUAL _____ trading as _____;

of _____, City of _____, State of _____, know as called the CONTRACTOR, Party of the Second Part.

WITNESSETH, that the parties hereto do mutually agree as follows:

ARTICLE I. The CONTRACTOR agrees to furnish equipment and labor to perform all work necessary for or incidental to, and to perform all obligations imposed by this Contract for WATER MAIN INSTALLATION to NORTH PENN WATER AUTHORITY.

ARTICLE II. The CONTRACTOR agrees to complete work as stated in the Detailed Specifications.

ARTICLE III. The CONTRACTOR shall receive and accept compensation for the performance of the Contract in accordance with the Proposal.

ARTICLE IV. It is agreed that the work in every respect, from the execution of this Contract and during the progress of the work, shall properly safeguard against any or all damages or injury (including death) to the public and to its employees and shall alone be responsible for any damage (including death) from its undertaking of the work to any person, persons or thing. The CONTRACTOR will solely and without qualification be responsible for use of equipment and personnel, for the safety of its employees and other persons, for the protection of public and private property, and for compliance with all local, state and federal laws and regulations, including OSHA regulations, in performance of work under this Contract. The AUTHORITY will not have any right to hire or fire CONTRACTOR'S employees or have any responsibility for or over the safety of CONTRACTOR'S employees or any other persons, or for or over the protection of public or private property, or for CONTRACTOR'S compliance with local, state or federal laws and regulations in performance of work under this Contract.

ARTICLE V. The CONTRACTOR shall indemnify and hold harmless the AUTHORITY and all its officers, agents and employees, from all suits or actions at law or in equity of any kind whatsoever arising out of, connected with, or caused by any operation or matter related to the project, including, among other things, injury to property and injury to and death of any persons, including employees of the CONTRACTOR or any SUBCONTRACTOR, and shall, as required by the AUTHORITY, produce evidence of

settlement of any such suit or action before final payment shall be made by the AUTHORITY. The provisions of this indemnification agreement shall include all accidents, injuries and claims made, whether or not caused in whole or in part, by any act, omission or negligence of the CONTRACTOR or any SUBCONTRACTOR, its officers, agents, or employees. CONTRACTOR shall, at his own cost and expense, defend such claim, suit, action or proceeding, groundless or not, which may be commenced against AUTHORITY by reason thereof or in connection therewith. CONTRACTOR shall pay any and all judgments which may be recovered in any such action, claim, proceeding or suit, and defray any and all expenses including cost and attorney's fees which may by incurred in or by reason of such action, claim, proceeding or suit.

ARTICLE VI. In the event of a conflict between this Agreement and any of the Contract Documents, the provisions of this Agreement shall govern.

ARTICLE VII. The CONTRACTOR represents and warrants to the AUTHORITY that:

(a) The CONTRACTOR is solvent financially and is experienced in and is competent to perform the work to be performed in ARTICLE I; and

(b) The CONTRACTOR is familiar with all federal, state, municipal, or other regulatory laws, ordinances and/or regulations which, in any manner whatsoever, may affect the work to be performed as provided in ARTICLE I.

ARTICLE VIII. It is the intention of the parties to be legally bound by this instrument.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in triplicate the day and year first above written.

NORTH PENN WATER AUTHORITY

(Authority Seal)

By: _____
Chairman

Attest: _____

CORPORATION

(Corporate Seal)

By: _____
CONTRACTOR

Attest: _____