PREPARED FOR: RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT PLANNING AND DEVELOPMENT

CONTRACT DOCUMENTS
WYOMING UPPER RESERVOIR DAM REPAIRS
RI DAM NO. 216
HOPKINTON/RICHMOND, RHODE ISLAND

PREPARED BY:

PARE CORPORATION
10 LINCOLN ROAD, SUITE 210
FOXBORO, MASSACHUSETTS 02035

PARE PROJECT NUMBER 16226.00

MAY 2020

PARE CORPORATION

TECHNICAL SPECIFICATIONS INDEX
Wyoming Upper Reservoir Dam Repairs
HOPKINTON / RICHMOND, RHODE ISLAND

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DIVISION 0 – CONTRACT

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

BID FORM

To: The State of Rhode Island Department of Administration
Division of Purchases, 2nd Floor
One Capitol Hill, Providence, RI 02908-5855

Bidder: _____
Legal name of entity

_____
Address (street/city/state/zip)

_____
Contact name Contact email

_____
Contact telephone Contact fax

1. BASE BID PRICE

The Bidder submits this bid proposal to perform all of the work (including labor and materials) described in the solicitation for this Base Bid Price (*including the costs for all Allowances, Bonds, and Addenda)*:

$_____
(base bid price *in figures* printed electronically, typed, or handwritten legibly in ink)

_____
(base bid price *in words* printed electronically, typed, or handwritten legibly in ink)

- **Allowances**

  NONE

- **Bonds**

  The Base Bid Price ***includes*** the costs for all Bid and Payment and Performance Bonds required by the solicitation.

- **Addenda**

  The Bidder has examined the entire solicitation (including the following Addenda), and the Base Bid Price ***includes*** the costs of any modifications required by the Addenda.

  All Addenda must be acknowledged.

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

Addendum No. 1 dated: _____

Addendum No. 2 dated: _____

Addendum No. 3 dated: _____

2. BASE BID BREAKDOWN

NOTE: The sum of the price of all Base Bid Breakdown Items should equal the Total Proposed Base Bid Price and shall include all work required in the Contract Documents. In case of a conflict the Proposed Base Bid Price shall govern.

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
1.	Contract Bonds	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
2.	General Requirements	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
3.	Mobilization and Demobilization	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
4A.	Erosion and Sediment Controls	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
4B.	Turbidity Barrier	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
5A.	Control of Water	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
5B.	Flood Restoration Contingency	EA	2	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
6A.	Clear, Grub and Strip Vegetation and Stockpile Topsoil	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					

CARRIED FORWARD _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BROUGHT FORWARD _____

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
6B.	Demolish Stone Masonry Walls, Segregate/Stockpile Stone for Reuse	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
7A.	Spillway Face Reconstruction	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
7B.	Masonry Walls Repointing	SF	1000	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
7C.	Masonry Walls/Spillway Face Re-Chinking	SF	3130	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
8A.	Concrete Spillway Apron - Demolition & Disposal	TON	100	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
8B.	Concrete Spillway Apron - Non-Structural Concrete Infill	CY	20	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					

CARRIED FORWARD _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BROUGHT FORWARD _____

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
8C.	Concrete Spillway Apron - Form, Reinforce, Anchor, Pour, Cure, & Finish Concrete	CY	60	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

9A.	Spillway Cutoff Wall – Excavation and Backfill	LS	1	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

9B.	Spillway Cutoff Wall – Upland Disposal of Excess Or Unsuitable Dredge Material	TON	225	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

9C.	Spillway Cutoff Wall – Disposal of Excess or Unsuitable Excavated Material	TON	225	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

10.	Abandon the Existing Low-Level Outlet	LS	1	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

11A.	Sluiceway Bridge & Control Structure Demolition & Disposal	LS	1	_____	_____

TOTAL BID ITEM PRICE IN WORDS: _____

CARRIED FORWARD _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BROUGHT FORWARD _____

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
11B.	Sluiceway Bridge Construction	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
11C.	Sluiceway Gate Fabrication And Installation	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
12A.	Center Embankment Grouting - Mobilization & Demobilization	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
12B.	Center Embankment Grouting - Grout Hole Drilling	LF	350	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
12C.	Center Embankment Grouting - Grout Mixing & Installation	GAL	1350	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
13A.	Right Embankment – Excavation and Backfill	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					

CARRIED FORWARD _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BROUGHT FORWARD _____

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
13B.	Right Embankment – Rock Removal	CY	100	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
13C.	Right Embankment – Disposal of Unsuitable Materials	TON	1750	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
13D.	Right Embankment – Dental Grouting	CY	20	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
13E.	Right Embankment – Form, Reinforce, Anchor, Pour, Cure, & Finish Concrete	CY	210	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
13F.	Right Embankment – Incidentals	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
14A.	Import Engineered Fill	TON	2200	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					

CARRIED FORWARD _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

NOTE: THE TOTAL BID ITEM PRICE FOR EACH ITEM MUST BE WRITTEN IN WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

BROUGHT FORWARD _____

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT BID PRICE	TOTAL BID ITEM PRICE
14B.	Import Armor Stone	TON	90	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
14C.	Import Riprap	TON	180	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
14D.	Import Bedding Stone	TON	90	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
14E.	Geotextile Fabric	SY	605	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					
15.	Loam and Seed	LS	1	_____	_____
TOTAL BID ITEM PRICE IN WORDS: _____					

TOTAL BASE BID PRICE _____

TOTAL BASE BID PRICE IN WORDS _____

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

4. CONTRACT TIME

The Bidder offers to perform the work in accordance with the timeline specified below:

- Start of construction: Date of Purchase Order
- Substantial completion: 450 Working Days from Start of Construction
- Final completion: 600 Working Days from Start of Construction

5. LIQUIDATED DAMAGES

The successful bidder awarded a contract pursuant to this solicitation shall be liable for and pay the State, as liquidated damages and not as a penalty, the following amount for each calendar day of delay beyond the date for substantial completion, as determined in the sole discretion of the State: $__800.00_____.

– – – – – – –

Solicitation #:_____
Solicitation Title: Wyoming Upper Reservoir Dam Repairs-Hopkinton/Richmond, RI

This bid proposal is irrevocable for 60 days from the bid proposal submission deadline.

If the Bidder is determined to be the successful bidder pursuant to this solicitation, the Bidder will promptly: (i) comply with each of the requirements of the Tentative Letter of Award; and (ii) commence and diligently pursue the work upon issuance and receipt of the purchase order from the State and authorization from the user agency.

The person signing below certifies that he or she has been duly authorized to execute and submit this bid proposal on behalf of the Bidder.

BIDDER

Date:_____

_____
Name of Bidder

_____
Signature in ink

_____
Printed name and title of person signing on behalf of Bidder

#_____
Bidder's Contractor Registration Number

SECTION 00700
GENERAL CONDITIONS

Agency Conditions of Use:

I. **AIA contract templates are not to be edited, altered, revised or modified by the agency or vendors without the prior written approval of the Division of Legal Services (401/222-8880).**

II. **Agencies are responsible to ensure proper use of the appropriate AIA contract template(s) on State public works projects.**

DRAFT AIA® Document A101™ – 2017 Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address, telephone and facsimile numbers, and website)

«State of Rhode Island, acting by and through the Department of Administration, Division of Purchases, on behalf of the User Agency»
«One Capitol Hill, Second Floor»
«Providence, Rhode Island 02908-5855»
«401.578.8100 (telephone); 401.574.8387 (facsimile)»
«www.ridop.ri.gov»

on behalf of the User Agency:
(Name, legal status, address, telephone and facsimile numbers, and website)

« »
« »
« »
« »
« »

and the Contractor:
(Name, legal status, address, telephone and facsimile numbers, and website)

« »
« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

« »
« »

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User Notes: A101- 2017 template revision date 6/13/2019 (3B9ADA24)

« »

The Design Agent:
(Name, legal status, address, telephone and facsimile numbers, and website)

« »
« »
« »
« »
« »

The Owner and Contractor agree as follows.

DRAFT

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2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General Conditions, Supplementary Conditions (if any), and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. No part of the Work shall be performed by Subcontractors without the Owner's prior written consent.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the later of: (i) the issuance of the Purchase Order by the Owner; and (ii) the date set forth in a notice to proceed issued by the User Agency.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

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Portion of Work	Substantial Completion Date
« »	

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. Subject to additions and deductions as provided in the Contract Documents, the Contract Sum shall be: $_____.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
« »	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
« »		

§ 4.3 Allowances, if any, are specified in the Bid Proposal Form and are included in the Contract Sum.

§ 4.4 Unit prices, if any, are specified in the Bid Proposal Form and include all costs, including without limitation, labor, materials, services, regulatory compliance, overhead, and profit necessary for the completion of the Work. Unit prices shall be used for both additions to, and deletions from the Work.

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

«**.1** In the event that there is one date for Substantial Completion of the Work, the Contractor shall pay the Owner the sum stipulated in this Section 4.5.1 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work is substantially complete: $_____.

.2 In the event that the Project is scheduled to be completed in phases, and there is more than one date for Substantial Completion of the Work, the Contractor shall pay the Owner an aggregate amount equal to the sums stipulated in this Section 4.5.2 as liquidated damages, and not as a penalty, for each calendar day of delay until the Work for each phase is substantially complete:

Phase	Liquidated Damages Sum

.3 The Owner and the Contractor have reasonably determined the sums set forth in this Section 4.5 to be a fair estimate of the Owner' actual damages which are difficult to ascertain in the event of delay.»

§ 4.6 Other:

The Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work.

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User Notes: (3B9ADA24)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Design Agent by the Contractor and Certificates for Payment issued by the Design Agent and approved by the Owner in writing, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 The Owner shall make payment of the certified amount, less retainage, to the Contractor not later than the 30th working day following written approval by the Owner.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor and approved by the Design Agent and the Owner in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Design Agent and the Owner may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2007, General Conditions of the Contract for Construction as modified by the Owner, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Design Agent determines, in the Design Agent's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Design Agent has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2007 as modified by the Owner;
- **.3** For Work performed or defects discovered since the last payment application, any amount for which the Design Agent may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2007 as modified by the Owner; and
- **.4** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due: five (5%) percent.

§ 5.1.7.1.1 Deleted.

§ 5.1.7.2 Deleted.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

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The amount of five (5%) percent shall be retained by the Owner through the date of Substantial Completion of the Work and then after the date of Substantial Completion of the Work in accordance with R.I. Gen. Laws § 37-12-10.1.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2007 as modified by the Owner.

§ 5.1.9 Except with the Owner's prior written approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.10 Within 10 working days of receipt of any progress payment from the Owner, the Contractor must pay its Subcontractors the full amount included for each such Subcontractor within the Contractor's Application for Payment in accordance with the provisions of AIA A201 – 2007, General Conditions of the Contract for Construction as modified by the Owner.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, less the amount withheld pursuant to § 5.1.7.3, shall be made by the Owner to the Contractor when:

- **.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2007 as modified by the Owner, and to satisfy other requirements, if any, which extend beyond final payment; and
- **.2** a final Certificate for Payment has been issued by the Design Agent and approved in writing by the Owner;
- **.3** the Contractor has submitted its final release and final releases from all of its Subcontractors and suppliers in a form acceptable to the Owner; and
- **4** the Contractor has submitted to the Owner all close-out documents, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 working days after the issuance of the Design Agent's final Certificate for Payment and written approval by the Owner.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 et seq.

§ 5.4 Owner's Rights

§ 5.4.1 The Owner shall have the right to deduct from any payments due to the Contractor the amount of any unpaid obligations owed to the State of Rhode Island by the Contractor, including without limitation, any and all unpaid taxes, the amount of any claim against the Contractor arising out of this Agreement, or any amount on account of any other reason permitted by applicable law.

§ 5.5 Pursuant to R.I. Gen. Laws § 44-1-6, the Owner shall withhold payment from the Contractor if the Contractor does not maintain a regular place of business in Rhode Island in the amount of three (3%) percent of the Contract Sum until 30 calendar days after Final Completion and compliance by the Contractor with the requirements of such section. The three (3%) percent withheld pursuant to R.I. Gen. Laws § 44-1-6 is not considered retainage which is held pursuant to § 5.1.7.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

Claims shall be referred to the Initial Decision Maker for initial decision. The Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 et seq., will serve as the Initial Decision Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 6.1. An initial decision shall be required as a condition precedent to binding dispute resolution pursuant to Section 6.3 of any Claim arising prior to the date final payment is due.

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§ 6.2 Mediation

For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 6.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 6.3, the Contractor shall have the option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of such option by the Contractor, the Owner and the Contractor shall attempt to select a mediator, and in the event that the Owner and the Contractor cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

§ 6.3 Binding Dispute Resolution

For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 6.1, or mediation at the option of the Contractor pursuant to Section 6.2, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 et seq.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007, as modified by the Owner. The Contract may also be terminated by the Owner: (i) in the event of the unavailability of appropriated funds; (ii) in the absence of a determination of continued need; or (iii) as otherwise provided in the State of Rhode Island Procurement Regulations General Conditions of Purchase or other applicable law.

§ 7.1.1 Deleted.

§ 7.2 The Work may be suspended by the Owner as provided in: (i) the State of Rhode Island General Conditions of Purchase Regulation or other applicable law; or (ii) Article 14 of AIA Document A201–2007 as modified by the Owner.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to: (i) the AIA Document A201 – 2007 or other Contract Document as modified by the Owner; and (ii) that provision in the AIA Document A201 – 2007 as modified by the Owner or other Contract Document as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Representatives for the Owner

§ 8.2.1 The Owner's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

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§ 8.2.2 The User Agency's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

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§ 8.2.3 The Design Agent's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

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§ 8.3 The Contractor's representative:
(Name, title, address, email address, and other information for the preferred methods of contact)

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§ 8.4 Neither the Owner's nor the Contractor's representative nor the Design Agent's representative shall be changed without 10 working days' prior notice to the other party.

§ 8.5 Insurance and Bonds
§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in the Solicitation and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in the Solicitation and elsewhere in the Contract Documents.

§ 8.6 Deleted.

§ 8.7 Other provisions:
§ 8.7.1 The Contractor represents and warrants to the Owner, in addition to any other representations and warranties of the Contractor elsewhere in the Contract Documents:

.1 The Contractor and its Subcontractors are each financially solvent, able to pay their debts as they mature, and possess sufficient working capital to perform their obligations under the Contract Documents.
.2 The Contractor and its Subcontractors are each able to furnish the tools, materials, equipment, and labor required to complete the Project as required under the Contract Documents.
.3 The Contractor and each Subcontractor are authorized to do business in the State of Rhode Island and are properly licensed by all necessary governmental authorities having jurisdiction over them and over the Work and the Project.
.4 The execution of this Agreement and its performance is within its duly authorized powers.
.5 The Contractor has visited the site of the Project, familiarized itself with the local and special conditions under which the Work is to be performed, and correlated its observations with the requirements of the Contract Documents.
.6 The Contractor possesses the requisite level of experience and expertise in the business administration, construction, and superintendence of projects of the size, complexity, and nature of the Project, and it will perform the Work with the care, skill, and diligence of a contractor possessing such experience and expertise.

§ 8.7.2 The representations and warranties of the Contractor in this Section 8.7 and elsewhere in the Contract Documents will survive the execution and delivery of this Agreement, any termination of this Agreement, and the final completion of the Work.

§ 8.7.3 Any Change Orders or other Modifications must be approved in writing by the Owner.

§ 8.7.4 The Owner is the State of Rhode Island, acting by and through its Department of Administration, Division of Purchases, and therefore, pursuant to the provisions of R.I. Gen. Laws § 34-28-31, mechanics liens may not be placed against the Project.

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ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, as modified by the Owner

.2 **Deleted.**

.3 AIA Document A201™–2007, General Conditions of the Contract for Construction, as modified by the Owner.

.4 **Deleted.**

.5 Drawings

The Drawings are included in the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.6 Specifications

The Specifications are included in the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.7 Addenda, if any, issued pursuant to the Solicitation form a part of the Solicitation and are available on the Division of Purchases website at www.ridop.ri.gov.

.8 Supplementary and other Conditions of the Contract, including without limitation, the State of Rhode Island General Conditions of Purchase Regulation.

.9 Other documents listed below:

.1 The Solicitation, issued by the Owner, including without limitation, the Invitation to Bid, the Instructions to Bidders, the Specifications and Drawings, any Addenda, and the Bid Checklist.

.2 The Bid Proposal, including without limitation, the Bid Form and the Bidder Certification Cover Form.

.3 The Purchase Order issued by the Owner.

§ 9.2 This Agreement and the Contract Documents are subject to, and governed by, the laws of the State of Rhode Island, including all procurement statutes and regulations (available at www.ridop.ri.gov), and applicable federal and local law, all of which are fully incorporated into this Agreement by this reference.

§ 9.3 In the event of any conflict between or among the Contract Documents, or any Contract Documents and any provision of the State of Rhode Island Procurement Regulations and/or any other provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws shall control.

ARTICLE 10 BENEFITS OF AGREEMENT

§ 10.1 The User Agency is a disclosed third-party beneficiary of this Agreement and shall have all of the rights and benefits hereunder to which such a party is entitled. Nothing contained in this Agreement shall create a contractual relationship with, or a cause of action in favor of, any other third party against the Owner or the User Agency.

§ 10.2 This Agreement shall be binding on the Contractor and its successors and assigns; provided, however, that the Contractor may not assign its rights nor delegate its responsibilities under this Agreement without the Owner's prior written consent.

This Agreement is entered into as of the day and year first written above; provided, however, that this Agreement shall not become a valid, binding, and enforceable contract unless and until the Owner shall have issued a Purchase Order.

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«**THE STATE OF RHODE ISLAND, acting by and through its Department of Administration, Division of Purchases**»	« »
OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

DRAFT

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Agency Conditions of Use:

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AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

for the following PROJECT:
(Name and location or address)
« »
« »

THE OWNER:
(Name, legal status and address)
The State of Rhode Island, acting by and through the Department of Administration
Division of Purchases, on behalf of the User Agency
One Capitol Hill, Second Floor
Providence, Rhode Island 02908-5855
(401) 574-8100 (telephone)
(401 574-8387 (facsimile)
www.ridop.ri.gov

THE USER AGENCY

(Name, address, telephone and facsimile numbers, and web address)

»« »
« »

THE Design Agent:
(Name, legal status, address, telephone and facsimile numbers, and web address)
« »« »
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TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

4 DESIGN AGENT

5 SUBCONTRACTORS

6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

7 CHANGES IN THE WORK

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8 TIME

9 PAYMENTS AND COMPLETION

10 PROTECTION OF PERSONS AND PROPERTY

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (the Agreement) and consist of the Agreement (and the documents enumerated therein), Conditions of the Contract (General Conditions, Supplementary Conditions, if any, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Design Agent.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Design Agent or the Design Agent's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Design Agent or the Design Agent's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Design Agent shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Design Agent's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Design Agent and the Design Agent's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items and services necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; the Contractor shall perform all work reasonably inferable from the Contract Documents as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

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§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of any conflicts or discrepancies among the Contract Documents, the provisions of the Contract Documents will be interpreted in in the order of priority set forth in Rhode Island Procurement Regulation 220-RICR-30-00-13.4(B).

§ 1.2.5 In the event of any conflicts or discrepancies between the Contract Documents and the State of Rhode Island Procurement Regulations or any provision of the Rhode Island General Laws, the State of Rhode Island Procurement Regulations and the Rhode Island General Laws will control.

§ 1.2.6 In the event of any inconsistency between the Drawings and Specifications, the better quality or greater quantity of Work shall be provided.

§ 1.2.7 The Owner will be the final decision maker for any and all interpretations.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Owner and the User Agency shall have a perpetual license to utilize the Drawings, Specifications, and other documents, including electronic or digital documents, prepared by the Design Agent and the Design Agent's consultants, for the execution of the Project and shall have and retain all rights to use them and reproduce them for the production and maintenance of the Work described therein. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Design Agent's or Design Agent's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Design Agent and the Design Agent's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Design Agent does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 Deleted.

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§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Deleted.

§ 2.2.2 The Contractor shall secure and pay for permits and fees, necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 If required for the Work in the discretion of the Owner, the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of any information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Deleted.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a 10 working-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Design Agent's additional services made necessary by such default, neglect, or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Design Agent. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Agent, or by tests, inspections, or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Owner and the Design Agent any errors, inconsistencies, or omissions discovered by or made known to the Contractor or additional Drawings, Specifications, or instructions required to define the Work in greater detail to permit the proper progress of the Work as a request for information in such form as the Design Agent may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Design Agent and the Owner any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Design Agent or Owner may require.

§ 3.2.3.1 Omissions from the Drawings and Specifications of items obviously needed to perform the Work properly, such as attachments, bolts, hangers, and other fastening devices, shall not relieve the Contractor from the obligation to furnish and install such items.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Design Agent issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2, 3.2.3, or 3.2.3.1, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Design Agent for damages resulting from errors, inconsistencies, or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.4.1 The Contractor shall not make any changes without prior written authorization from the Design Agent and the Owner.

§ 3.2.5 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Design Agent and shall not proceed with that portion of the Work without further written instructions from the Design Agent. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Whenever the Contractor has an obligation to provide labor and materials under the Agreement, the Contractor, at a minimum, shall provide the labor for, and furnish and install and place in operation all items, including without limitation, all proper connections.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Design Agent in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Design Agent and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and the Design Agent that materials and equipment furnished under the Contract will be of first quality, prime manufacture, and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Design Agent, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.2 The State of Rhode Island is exempt from payment of any federal or state excise, transportation, or sales tax. The Rhode Island Department of Administration Division of Purchases will furnish Exemption Certificates upon request.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections required by the Rhode Island State Building Code necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be responsible for obtaining the Certificate of Occupancy from the appropriate governmental authorities.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 The Contractor shall promptly notify the Design Agent and the Owner if the Contractor becomes aware that the Contract Documents are not in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the Contractor performs Work knowing it to be contrary to

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applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Design Agent before conditions are disturbed and in no event later than 21 working days after first observance of the conditions. The Design Agent will promptly investigate such conditions and, if the Design Agent determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Design Agent determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Design Agent shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Design Agent's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Design Agent. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Design Agent the name and qualifications of a proposed superintendent. The Design Agent may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the Design Agent has reasonable objection to the proposed superintendent or (2) that the Design Agent requires additional time to review. Failure of the Design Agent to reply within the 14 working-day period shall constitute notice of no reasonable objection.

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§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, within 20 working days after the issuance of the Purchase Order, shall prepare and submit for the Owner's and Design Agent's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals, not less frequently than monthly, as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall certify on the initial schedule and all revised schedules that they comply with the Contract Documents.

§ 3.10.2 The Contractor shall prepare a submittal schedule, within 20 working days after the issuance of the Purchase Order, and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Owner's and the Design Agent's approval. The Owner's and the Design Agent's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Owner and the Design Agent reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Design Agent.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Design Agent and shall be delivered to the Design Agent for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Design Agent is subject to the limitations of Section 4.2.7. Informational submittals upon which the Design Agent is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Design Agent without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Design Agent Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Owner and the Design Agent or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

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§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Design Agent that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Design Agent.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Design Agent's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Design Agent in writing of such deviation at the time of submittal and (1) the Design Agent has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Design Agent's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Design Agent on previous submittals. In the absence of such written notice, the Design Agent's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Design Agent will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Design Agent. The Owner and the Design Agent shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Design Agent have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Design Agent will review, approve, or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Design Agent for evaluation of resubmittals.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, and any restrictions imposed by the User Agency or the Owner, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

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§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Design Agent access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Design Agent harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Design Agent. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Design Agent and the Owner.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, the User Agency and the State of Rhode Island in accordance with Rhode Island Procurement Regulation 220-RICR-30-00-13.21.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

§ 3.18.3 Without limiting the generality of the foregoing, the defense and indemnity set forth in this Section 3.18 includes, without limitation, all liabilities, damages, losses, claims, demands, and actions on account of bodily injury, death, or property loss to a person or entity indemnified hereunder or any other persons or entities, whether based upon statutory (including, without limitation, workers compensation), contractual, tort, or other liability of any person or entity so indemnified.

§ 3.18.4 The remedies set forth herein shall not deprive any person indemnified hereunder of any other indemnity action, right, or remedy otherwise available to any such person or entity at common law or otherwise.

§ 3.18.5 The Contractor will include the indemnity set forth in this Section 3.18, without modification, in each Subcontract with any Subcontractor.

§ 3.18.6 Notwithstanding any other language in the Contract Documents to the contrary, the indemnity hereunder shall survive Final Completion of the Work and final payment under the Agreement and shall survive any termination of the Agreement.

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ARTICLE 4 DESIGN AGENT

§ 4.1 GENERAL

§ 4.1.1 The Design Agent is the person lawfully licensed to practice his or her profession in the State of Rhode Island or an entity lawfully practicing its profession in the State of Rhode Island and identified in the Contract Documents as the Design Agent. The term "Design Agent" means the Design Agent or the Design Agent's authorized representative.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Design Agent as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Design Agent. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Design Agent is terminated, the Owner shall employ a successor Design Agent as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Design Agent.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Owner with assistance from the Design Agent will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction through the date the Design Agent issues the final Certificate for Payment and continuing until the expiration of the one-year period following Final Completion. The Design Agent will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Design Agent will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Design Agent will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Design Agent will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.

§ 4.2.3 On the basis of the site visits, the Design Agent will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Design Agent will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Design Agent will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Design Agent about matters arising out of or relating to the Contract. Communications by and with the Design Agent's consultants shall be through the Design Agent. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Design Agent's evaluations of the Contractor's Applications for Payment, the Design Agent will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Design Agent has authority to reject Work that does not conform to the Contract Documents. Whenever the Design Agent considers it necessary or advisable, the Design Agent will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Design Agent nor a decision made in good faith either to

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exercise or not to exercise such authority shall give rise to a duty or responsibility of the Design Agent to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Design Agent will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Design Agent's action will be taken in accordance with the submittal schedule approved by the Design Agent or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Design Agent's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Design Agent's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Design Agent's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Design Agent, of any construction means, methods, techniques, sequences or procedures. The Design Agent's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Design Agent will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Design Agent will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Design Agent will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Design Agent agree, the Design Agent will provide one or more project representatives to assist in carrying out the Design Agent's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Design Agent will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Design Agent will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Design Agent will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Design Agent's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents and approved by the Owner.

§ 4.2.14 The Design Agent will review and respond to requests for information about the Contract Documents. The Design Agent's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Design Agent will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and the Design Agent the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each portion of the Work. The Owner may reply within 14 working days to the Contractor in writing stating (1) whether the Owner or the Design Agent has reasonable objection to any such proposed person or entity or (2) that the Owner or Design Agent requires additional time for review.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Design Agent has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Agent has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Design Agent makes reasonable objection to such substitution.

§ 5.2.5 MANUFACTURERS AND FABRICATORS

§ 5.2.5.1 Not later than 10 working days after the date of commencement of the Work, the Contractor shall furnish in writing to the Owner and the Design Agent the names of the manufacturers or fabricators for certain products, equipment, and systems identified in the Specifications and, where applicable, the name of the installing Subcontractor. The Owner may reply within 14 working days to the Contractor in writing, stating: (i) whether the Owner or the Design Agent has reasonable objection to any such proposed person manufacturer or fabricator; or (ii) whether the Owner or Design Agent requires additional time to review.

§ 5.2.5.2 The Contractor shall not contract with a proposed manufacturer, fabricator, or Subcontractor to whom the Owner or Design Agent has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5.3 If the Owner or Design Agent has an objection to a manufacturer, fabricator, or Subcontractor proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Agent has no objection.

§ 5.2.5.4 The Contractor shall not substitute a manufacturer, fabricator, or Subcontractor previously selected if the Owner or Design Agent makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Design Agent. Upon the request of the User Agency and/or the Owner, the Contractor shall provide the User Agency and/or the Owner with copies of each subcontract agreement. Each subcontract agreement shall preserve and protect the rights of the Owner and Design Agent under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor,

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unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 working days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Design Agent apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an

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acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement between the Owner and the Contractor; a Construction Change Directive requires agreement by the Owner and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Design Agent alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Contractor and signed by the Owner, Contractor and Design Agent stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Subsequent to the approval of a Change Order as provided in § 7.1.2, whether such Change Order changes the Contract Sum or Contract Time or both, no additional claim related to such Change Order will be considered by the Owner. Any change, once incorporated into a Change Order, is all inclusive, and includes all factors that could have been considered at the time of the Change Order such as Project impact or schedule "ripple" effect.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Design Agent and signed by the Owner, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

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.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.7.

§ 7.3.4 Deleted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Agent of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Design Agent shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.3.1. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Design Agent may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:
.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
.2 Costs of materials, supplies and equipment, including cost of delivery;
.3 Rental costs of machinery and equipment, exclusive of hand tools; or
.4 Costs of premiums for all bonds and insurance and permit fees related to the Work..

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Design Agent. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Design Agent will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Design Agent determines, in the Design Agent's professional judgment, to be reasonably justified. The Design Agent's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Design Agent concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Contractor will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:
.1 For the Contractor, for work performed by the Contractor's own forces, an amount not to exceed ten (10%) percent of the cost.
.2 For the Contractor, for work performed by the Contractor's Subcontractors, an amount not to exceed five (5%) of the amount due to the Subcontractors.
.3 For each Subcontractor, for work performed by the Subcontractor's own forces, an amount not to exceed ten (10%) percent of the cost.

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.4 Where the Work represents both additions and deletions and results in a net increase, the allowable overhead and profit shall be in accordance with this Section 7.3.11, but in no event shall the amount exceed fifteen (15%) percent of the net increase in the cost of the Work.

§ 7.3.12 All proposals with an aggregate cost equal to or in excess of $500.00 shall be accompanied by a detailed itemization of costs, including labor, materials (quantities and prices), and Subcontracts, in a form acceptable to the Owner. In no event will a change order request reflecting an aggregate cost equal to or in excess of $500.00 be approved without such itemization.

§ 7.4 MINOR CHANGES IN THE WORK

The Design Agent with the prior written approval of the Owner has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be affected by written order signed by the Design Agent and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

The date of commencement of the Work is the date established in Section 3.1 of the Agreement..

§ 8.1.3 The date of Substantial Completion is the date certified by the Design Agent in accordance with Section 9.8.

§ 8.1.4 Deleted.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Design Agent, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Within 20 working days of the issuance of the Purchase Order, and promptly if revision is necessary from time to time as a result of a Change Order, the Contractor shall submit to the Owner, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Design Agent and the Owner may

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require. This schedule, if and when approved by the Design Agent and the Owner in writing, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least 10 working days before the date established for each progress payment, the Contractor shall submit to the Design Agent and the Owner for approval an itemized Application for Payment prepared in accordance with the schedule of values for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or the Design Agent may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 All Applications for Payment for Change Orders must be accompanied by a Notice of Change in Purchase Order issued by the Owner, and if directed by the Owner, by the User Agency.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 The form of Application for Payment shall be AIA Document G702, Application and Certification for Payment, supported by AIA Document G702A, Continuation Sheet.

§ 9.3.1.4 Until Substantial Completion, the Owner shall pay ninety-five (95%) percent of the amount due the Contract on account of progress payments.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work. The Contractor shall immediately satisfy any lien, claim, or encumbrance against the site where the Project is located and indemnify the Owner from and against all resulting costs and expenses, including without limitation, attorneys' fees.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Design Agent will, within 7 working days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Design Agent determines is properly due, or notify the Contractor and Owner in writing of the Design Agent's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Design Agent to the Owner, based on the Design Agent's evaluation of the Work and the data comprising the Application for Payment, that, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Design Agent. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Design Agent has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3)

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reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.4.3 The Contractor must submit all product literature, material and color samples with each Application for Payment, or as otherwise required by the Owner.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Design Agent will withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Design Agent's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Design Agent is unable to certify payment in the amount of the Application, the Design Agent will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Design Agent cannot agree on a revised amount, the Design Agent will promptly issue a Certificate for Payment for the amount for which the Design Agent is able to make such representations to the Owner. The Design Agent may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Design Agent's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of:

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** failure to carry out the Work in accordance with the Contract Documents; or
- **.8** any other failure to comply with the obligations of the Contractor under the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 The Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Design Agent and the Design Agent will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Design Agent has issued a Certificate for Payment and the Owner has approved the Certificate for Payment in writing, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Design Agent.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than 10 working days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Design Agent will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Design Agent and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within 7 working days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. The Owner shall have the

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right to withhold payment(s) to the Contractor in the event that any Subcontractors or material and equipment suppliers have not been properly paid. Neither the Owner nor Design Agent shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Design Agent does not issue a Certificate for Payment, through no fault of the Contractor, within 7 working days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within 7 working days after the date established in the Contract Documents the amount certified by the Design Agent or awarded by binding dispute resolution, then the Contractor may, upon 7 additional working days' written notice to the Owner and Design Agent, make a claim for payment as provided under the provisions of applicable law.

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§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Design Agent a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Design Agent will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Design Agent's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Design Agent. In such case, the Contractor shall then submit a request for another inspection by the Design Agent to determine Substantial Completion. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Design Agent will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment less the amount of five (5%) percent to be retained by the Owner in accordance with R.I. Gen. Laws § 37-12-10.1. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

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§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Design Agent as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Design Agent.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Design Agent shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Agent will promptly make such inspection and, when the Design Agent finds the Work acceptable under the Contract Documents and the Contract fully performed, the Design Agent will promptly issue a final Certificate for Payment stating that to the best of the Design Agent's knowledge, information and belief, and on the basis of the Design Agent's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Design Agent's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. The Design Agent will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Design Agent for any additional inspections.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Design Agent (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, and (6) all other close-out documents required by the Owner, including without limitation, all as-built plans, warranties, manuals, and other materials set forth in the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting Final Completion, and the Design Agent so confirms, the Owner shall, upon application by the Contractor and certification by the Design Agent, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the

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Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Design Agent prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** claims permitted under the State of Rhode Island General Conditions of Purchase Regulation.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§ 9.11 The Contractor and the Contractor's surety shall be liable for and shall pay the Owner as liquidated damages the sums specified in the Solicitation and Bid Form, or if completed, the amount set forth in Section 3.4 of the Agreement.

§ 9.12 Warranties required by the Contract Documents shall commence on the date of Final Completion of the Work.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel and in consultation with the appropriate governmental authorities.

§ 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the User Agency and the Owner reasonable advance notice.

§ 10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

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§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Design Agent or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Design Agent.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Design Agent in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Design Agent the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Design Agent will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Design Agent has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Design Agent have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the extent permitted by the provisions of R.I. Gen. Laws §§ 9-31-1 et seq., the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Design Agent, Design Agent's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

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§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as is specified in the Solicitation and as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage;
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations; and
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.1.2 The Contractor's liability insurance shall include all major coverages and be on a comprehensive general liability basis.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance as specified in the Solicitation and as otherwise acceptable to the Owner shall be filed with the Owner and the User Agency prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 working days' prior written notice has been given to the Owner and the User Agency. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning

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reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the User Agency, and their elected and appointed officials, members, employees, and agents, the Design Agent and the Design Agent's consultants as additional insureds for claims caused in whole or in part by the Contractor's acts or omissions during the Contractor's operations; and (2) the Owner, the User Agency, and their elected and appointed officials, members, employees, and agents, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.1.5 The Contractor shall be responsible for the prompt payment to the Owner of any deductible amounts under any insurance policies required under the Contract Documents for claims made pursuant to such policies.

§ 11.2 OWNER'S LIABILITY INSURANCE.

§ 11.2.1 The Contractor shall furnish the Owner and the User Agency, through the Design Agent, an insurance certificate providing Owner's Protective Liability extended to include the interests of the Design Agent, and to protect the Owner, User Agency, and Design Agent from any liability which might be incurred against any of them as a result of any operation of the Contractor or Subcontractors or their employees or anyone for whom either the Contractor or Subcontractors are responsible. Such insurance shall be written for the same limits as the Contractor's commercial general liability insurance and shall include the same coverage.

§ 11.2.2 If the Owner engages separate contractors to perform work for, or in or around, the Project, it shall require in its contracts with each separate contractor that Contractor and its officers, directors, partners, members, employees, and agents shall be: (i) named as additional insureds on a primary, noncontributory basis to any commercial general liability, pollution liability, and excess liability insurance policies; and (ii) provided a waiver of subrogation on all workers compensation and professional liability insurance policies.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the state of Rhode Island, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the User Agency, the Contractor, Subcontractors and Sub-subcontractors in the Project. If the Owner and/or the User Agency incur any damages by failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable cost resulting from such failure.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Design Agent's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 Deleted.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

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§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 Deleted.

§ 11.3.3 Deleted.

§ 11.3.4 Deleted.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 working days' prior written notice has been given to the Owner and the User Agency.

§ 11.3.7 WAIVERS OF SUBROGATION

The Contractor waives all rights against the Owner and the User Agency and any of their subcontractors, sub-subcontractors, agents and employees, and (2) the Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Design Agent, Design Agent's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under this property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Contractor as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within 5 working days after occurrence of loss to the Contractor's exercise

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of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in the Solicitation.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Design Agent's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Design Agent, be uncovered for the Design Agent's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Design Agent has not specifically requested to examine prior to its being covered, the Design Agent may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Design Agent or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Design Agent's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Final Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time after receipt of notice from the Owner or Design Agent, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.2.4 Upon request by the Owner and prior to the expiration of one year from the date of Final Completion, the Design Agent will conduct and the Contractor shall attend 2 meetings with the Owner to review the facility operations and performance.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

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§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the State of Rhode Island.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to any executive, legislative, judicial, regulatory, or administrative body of the state, or any political subdivision thereof, including without limitation, any department, division, agency, commission, board, office, bureau, authority, school, water, or fire district, or other agency of Rhode Island state or local government that exercises governmental functions, any other governmental authority, and any quasi-public corporation and/or body corporate and politic. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice, or when received, if manually delivered or transmitted by electronic mail or facsimile to the last such address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Design Agent or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Design Agent timely notice of when and where tests and inspections are to be made so that the Design Agent may be

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present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Design Agent, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Design Agent will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Design Agent of when and where tests and inspections are to be made so that the Design Agent may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Design Agent's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Design Agent.

§ 13.5.5 If the Design Agent is to observe tests, inspections or approvals required by the Contract Documents, the Design Agent will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

No interest shall be due or payable on account of any payment due or unpaid under the Contract Documents except in accordance with the provisions of "Prompt Payment by Department of Administration," R.I. Gen. Laws §§ 42-11.1-1 et seq.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 calendar days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped; or
- **.3** Because the Design Agent has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1

§ 14.1.2 Deleted.

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon 7 working days' written notice to the Owner and Design Agent, terminate the Contract and recover from the Owner payment for Work executed.

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§ 14.1.4 If the Work is stopped for a period of 60 calendar days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon 7 additional days' written notice to the Owner and the Design Agent, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- **.1** refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** disregards or fails to comply with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- **.4** otherwise is guilty of breach of a provision of the Contract Documents; or
- **.5** cancels or the Contractor or the Owner receives notice of cancellation or nonrenewal of any insurance required under the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, 7 working days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Design Agent's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Owner shall not be liable to the Contractor or any Subcontractor for claims or damages of any nature caused by or arising out of any delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work in accordance with the provisions of Section 8.3.1.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

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.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party. Such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly serviced if delivered in person, by mail, by courier, or by electronic transmission. Claims by either party must be initiated within 21 working days after occurrence of the event giving rise to such Claim or within 21 working days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Design Agent will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.5.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.6 The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this Contract. This waiver includes damages incurred by the Contractor for principal office expenses, including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit. This waiver is applicable, without limitation, to all consequential damages due to the

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Contractor's termination in accordance with Article 14. Nothing in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims shall be referred to the Initial Decision Maker for initial decision. The Purchasing Agent appointed pursuant to the provisions of the "State Purchases Act," R.I. Gen. Laws § 37-2-1 et seq., will serve as the Initial Decision Maker in accordance with the provisions of the State Purchases Act, State of Rhode Island Procurement Regulations, and this Section 15.2.1. An initial decision shall be required as a condition precedent to binding dispute resolution pursuant to Section 15.3.1 of any Claim arising prior to the date final payment is due.

§ 15.2.2 Deleted.

§ 15.2.3 Deleted.

§ 15.2.4 Deleted.

§ 15.2.5 Deleted.

§ 15.2.6 Deleted.

§ 15.2.6.1 Deleted.

§ 15.2.7 Deleted.

§ 15.2.8 Deleted.

§ 15.3 MEDIATION

§ 15.3.1 For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, and prior to the implementation of the binding dispute resolution procedures set forth in Section 15.4.1, the Contractor or the Design Agent shall have the option to pursue mediation, exercisable by written notice to the Owner within 30 calendar days of an Initial Decision. In the event of the exercise of such option by the Contractor or the Design Agent, the Owner and the Contractor or the Design Agent shall attempt to select a mediator, and in the event that the Owner and the Contractor or the Design Agent cannot agree on a mediator, either party may apply in writing to the Presiding Justice of the Providence County Superior Court, with a copy to the other, with a request for the court to appoint a mediator, and the costs of the mediator shall be borne equally by both parties.

§ 15.3.2 Deleted.

§ 15.3.3 Deleted.

§ 15.4 BINDING DISPUTE RESOLUTION

§ 15.4.1 For any Claim not resolved by the Initial Decision Maker procedures set forth in Section 15.2.1, or mediation at the option of the Contractor pursuant to Section 15.3.1, the method of binding dispute resolution shall be determined in accordance with the provisions of the "Public Works Arbitration Act," R.I. Gen. Laws §§ 37-16-1 et seq.

§ 15.4.4 Deleted.

§ 15.4.4.1 Deleted.

§ 15.4.4.2 Deleted.

§ 15.4.4.3 Deleted.

§ 16 COMPLIANCE WITH APPLICABLE LAW

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The Contractor and its Subcontractors shall comply with all applicable federal, state, and local laws.

DRAFT

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DIVISION 1 – GENERAL

SECTION 01000
SUMMARY OF WORK

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings, General Provisions of the Contract, and all Technical Specification Sections apply to the work of this Section.

1.02 PROJECT IDENTIFICATION:

A. General: Project name is "Wyoming Upper Reservoir Dam Repairs".

B. Contract Documents: The work to be performed under this Contract is shown in the Contract Documents prepared by Pare Corporation of Foxboro, Massachusetts.

1.03 SUMMARY OF WORK:

A. The work required by these specifications shall include furnishing all labor, skill, supervision, tools, construction plant, equipment and materials, and performing all operations to properly complete contract work as shown on the Drawings, as mentioned in these specifications, and as evidently required, to the complete satisfaction of the Owner and the Engineer.

B. The Contractor is responsible for updating and/or filing any Local, State, and/or Federal permits to complete construction); with the exception of the RIDEM Insignificant Alteration Permit (previously filed by Pare)

C. The following summary of work is intended to be general in nature and shall not be considered direction by the Engineer or the Owner. Although it is likely that some of the work items will overlap, construction sequences, phases, cofferdam alignments, and order for the various project components are described separately and may not necessarily proceed in the order presented. The work on the Wyoming Upper Reservoir Dam Repairs project, includes but is not limited to:

1. Mobilize to the project site; establish site access and staging areas.
2. Install and maintain erosion controls.
3. Clear, grub, and strip all vegetation to the limits shown on the plans.
4. Install Phase I upstream cofferdams (left side of spillway). Allow flow to continue over 2/3 of the primary spillway.
    a. Remove existing bridge and sluiceway controls/infrastructure.
    b. Prepare the sluiceway for the installation of new controls and gates. If gates are available install the gates and controls; otherwise, gate and control installation can be deferred to Phase III.
    c. Complete center embankment improvements.
    d. Repoint walls around sluiceway.
    e. Install a new timber foot bridge spanning the sluiceway.
    f. Demolish and dispose of the exiting concrete apron and concrete caplog along the existing spillway and excavate/dredge soils upstream of the primary spillway to expose potential voids in the upstream soils within Phase I cofferdam limits.
    g. Install a new concrete apron and caplog atop the spillway and install an engineered fill cutoff trench along the upstream face of the primary spillway within phase i cofferdam limits.

h. Rebuild failed stone masonry sections along the primary spillway.
i. Re-chink / repoint stone masonry training walls within 10 feet upstream and downstream of flow areas.
j. Re-chink the downstream spillway face within the limits of the Phase I cofferdam.
k. Flood and remove Phase I cofferdam and divert flow through sluiceway.
l. Drawdown impoundment to el. 91.0± by allowing flow through sluiceway.

5. Install Phase II cofferdams (right side of spillway). Divert flow through sluiceway and allow flow to continue over 1/3 of the primary spillway.
   a. Excavate embankment soils right of the primary spillway and deconstruct existing downstream wall. Stockpile wall stones for reuse as upstream slope armoring.
   b. Construct the downstream retaining wall at the right embankment.
   c. Construct the low-level outlet chamber.
   d. Install new low-level outlet conduit and control gates.
   e. Backfill and regrade embankment right of spillway.
   f. Plug flow and abandon (fill with grout) the existing low-level outlet. Excavate, stockpile, and replace upstream sediment/soil as necessary to facilitate abandonment.
   g. Demolish and dispose of the exiting concrete apron and concrete caplog along the existing spillway and excavate/dredge soils upstream of the primary spillway to expose potential voids in the upstream soils within phase ii cofferdam limits.
   h. Install a new concrete apron and caplog atop the spillway and install an engineered fill cutoff trench along the upstream face of the primary spillway within phase ii cofferdam limits.
   i. Re-chink the downstream spillway face within the limits of the phase ii cofferdam.
   j. Remove Phase II cofferdam.
6. If gates and sluiceway controls were not installed during Phase I work due to availability of materials, install a local cofferdam to prevent flow through the sluiceway.
   a. If needed divert baseflow through the newly installed low-level outlet.
   b. Install sluiceway gates and controls.
   c. Remove Phase III cofferdam.
7. Remove erosion controls, water diversion systems, and cofferdams. Dispose of unsuitable materials off-site.
8. Restore the site and demobilize from the site.

D. The work is located at Wyoming Upper Reservoir Dam in the Towns of Richmond and Hopkinton, Washington County, Rhode Island. Access points to the site are from the Wyoming Dam Fishing Access across from 17 Bridge Street, Richmond, RI and from an open area adjacent to the dam's right abutment off of Prospect Square, Hopkinton, RI. Prior to construction, the Contractor shall identify all bridges with load restrictions on any and all haul routes proposed to be used for this project and assure that throughout construction these load restrictions are not exceeded by any project related hauling activities.

E. During the construction, monitoring will be ongoing and the Contractor shall accommodate the Owner's representatives.

F. Coordinate all work with the Owner and the Engineer and maintain the site in a clean, orderly condition during and upon completion of work.

G. The Contractor shall have in place a Construction Flood Contingency Plan to accommodate flows associated with the 10-year storm event. Beyond the 10-year storm event and up to the 100-year storm event, the Construction Flood Contingency Plan shall address flows associated with the

100-year storm, 24-hour duration Type III storm event without compromising the dam (See Sections 01070, 01560, and 02400).

H. In cases where the Specifications and Drawings include the provision for particular work, equipment or systems as part of the Contract, but do not completely specify all work incidental to such a provision, or do not provide complete detailed designs for all parts of the provision, then the Contractor will provide or perform such incidental work or design services using generally accepted standards of engineering, material, and construction. All Contractor designs shall be approved in writing by the Engineer prior to proceeding with the work.

1.04 PERMITS

A. Work should be performed in accordance with the following permits:

1. Dam Safety Permit (RIDEM)

B. Contractor is responsible for filing a RIPDES General Permit for Stormwater Discharge associated with Construction Activity.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01019
CONTRACT CONSIDERATIONS

PART 1.00 - GENERAL

1.01 RELATED SECTIONS

A. Owner-Contractor Agreement: Contract sum/price including allowances. Bonds and Insurance Requirements.

B. Section 01700 - Contract Close Out.

1.02 INSPECTION AND TESTING

A. The Contractor shall be responsible for engaging an inspection or testing firm, execution of inspection or tests, and reporting results as per Section 01400.

B. The Contractor will cooperate with the Owner and provide the Owner's agents with the facilities necessary to sample and inspect during each phase of construction at no cost to the Owner. The Contractor shall be responsible for all costs associated with retesting areas that have previously failed.

1.03 APPLICATIONS FOR PAYMENT

A. Submit four (4) copies of each applications on AIA Form G.703.

B. For each item, provide a column for listing: Item Number; Description of Work; Scheduled Value, Previous Applications; Work in Place and Stored Materials under this Application; Authorized Change Orders; Total Completed and Stored to Date of Applications; Percentage of Completion; Balance to Finish; and Retainage.

C. Present required information in typewritten form.

D. Execute certification by signature of authorized officer.

E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.

F. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

G. Prepare Application for Final Payment as specified in Section 01700 - Contract Closeout.

1.04 CHANGE PROCEDURES

A. The Engineer/Owner will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by the Engineer/Owner, by issuing written supplemental instructions.

B. The Engineer/Owner may issue a Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within 7 days.

C. The Contractor may propose a change by submitting a request for change to the Engineer/Owner, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01340. No change will be allowed except under written approval and Notice of Change from the Engineer/Owner, verbal orders are not binding.

D. Stipulated Sum/Price Change Order: Based on Notice of Change and Contractor's estimated price quotation.

E. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

F. Work Directive Change: The Engineer/Owner may issue a directive, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.

G. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. The Engineer/Owner will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.

H. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

I. Execution of Change Orders: The Engineer/Owner will issue Change Orders for signature of parties as provided in the Conditions of the Contract.

1.05 SUBSTANTIAL COMPLETION

A. For the purposes of this project, substantial completion shall be considered after a point when all site work is completed and the contractor is prepared to demobilize from the site. Work to be completed subsequent to substantial completion shall be limited to achieving satisfactory stands of grass in seeded areas, monitoring and replacing plantings which do not survive, invasive species monitoring requirements, and project closeout requirements.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 – EXECUTION

Not Used

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1.00 - GENERAL

1.01 ADMINISTRATIVE SUBMITTALS

A. Application for Payment: In accordance with the General Conditions and as specified herein.

B. Final Application for Payment: As specified herein.

1.02 APPLICATION FOR PAYMENT

A. Reference the General Conditions.

B. Use separate, detailed Application for Payment Form suitable to Owner for each pay application.

C. Preparation:

1. List each Change Order and Written Amendment executed prior to date of submission as separate line item.
2. Submit three (3) copies of Application for Payment Form, and such supporting data as may be requested by Owner.

1.03 MEASUREMENT - GENERAL

A. Reference the General Conditions for additional requirements on Unit Price Work.

B. All unit prices which are specified for measurement by the linear foot (LF) shall be measured from the beginning to the termination point of the unit being measured.

C. Measurement and payment for all bid items shall include furnishing all equipment, material, plant, and personnel required for completion the work in accordance with the contract documents unless otherwise noted.

D. Units of measure shown on the Bid Form shall be as follows unless specified otherwise.

Item	Method of Measurement
CY	Cubic Yard – Field Measure by Engineer using the Average-End -Area Method to Calculate Volume
EA	Each-Field Count by Owner/Owner's Representative
TON	Ton-Certified Truck Scale
LF	Linear Foot-Field Measure by Engineer
LS	Lump Sum-Unit is one; no measurement will be made.
SF	Square Foot-Field Measured by Engineer
SY	Square Yard-Field Measured by Engineer

1.04 PAYMENT

A. General: Progress payment requests shall be submitted monthly as specified in the General Conditions.

B. Payment for Lump Sum Work covers all personnel, equipment, materials, and incidentals required to furnish, install and/or complete the Work as specified, indicated, and directed as indicated in the Construction Documents for the following items.

C. Payment for unit price items covers all personnel, equipment, materials, and incidentals required to furnish, install and/or complete the Work as specified, indicated, and directed as indicated in the Construction Documents for the following items

Bid Item No.	Unit	Title/Description
1	LS	**Contract Bonds:** Furnish all material, labor, and equipment to furnish; Performance Bonds, Labor Bonds, Materials Bonds and any other bonds required within the contract documents.
2	LS	**General Requirements:** Furnish all material, labor, and equipment to furnish, work plans, schedules, meetings, submittals, temporary construction facilities, permits, QC/QA, materials testing, closeout documentation, closeout survey, and Record Contract Documents as stated within the Contract Documents.
3	LS	**Mobilization & Demobilization:** Furnish all material, labor, and equipment and stage on-site: personnel, equipment, and materials to complete all work items stated in the Contract documents (with the exception of material, labor, and equipment as stated in Item 12A); install site signage, RIDEM file number signs, and warning signs; install temporary security fencing to secure work areas; prepare the site for construction; establish and maintain access roads; protect site utilities and other facilities to remain; move out personnel, equipment, and unused material; restore and clean portions of the site disturbed by construction and entrances; remove and dispose of signs and security fencing; and remove all debris and rubbish. This item is inclusive of site restoration and loam and seeding for areas disturbed by construction outside of loam and seed Pay Limits.
4A	LS	**Erosion and Sediment Controls:** Furnish all material, labor, and equipment to install, and maintain straw bales, silt fence; and to remove erosion and sediment controls in their entirety at project completion.
4B	LS	**Turbidity Barrier:** Furnish all material, labor, and equipment to install, anchor, maintain, relocate, and remove turbidity barrier(s) to prevent the transport of sediment laden water beyond the work area.
5A	LS	**Control of Water:** Furnish all material, labor, and equipment to design, install, and maintain dewatering pumps to maintain dry working areas; design and install temporary cofferdams, dewatering systems, dewatering basins, diversions, and other water control structures to complete the work.
5B	EA	**Flood Restoration Contingency:** Furnish all material, labor, and equipment to repair cofferdams and clean work areas after an overtopping event in excess of the control of water requirements. Note that only the overtopping of the Phase II cofferdam is subject to payment under this item. Other Phases of work that overtop are not subject to payment under this item. The cost for this item is not to exceed $10,000 per occurrence.
6A	LS	**Clear, Grub, and Strip Vegetation and Stockpile Topsoil:** Furnish all material, labor, and equipment to clear and grub all vegetation inclusive of woody and herbaceous vegetation, debris, stumps, and roots within existing areas; remove and dispose of off-site all cleared and grubbed materials not suitable for reuse. Remove and dispose other deleterious material from areas to be regraded. Stockpile suitable topsoil/loam for reuse.
6B	LS	**Demolish Stone Masonry Walls, Segregate/Stockpile Stone for Reuse:** Furnish all material, labor, and equipment to demolish stone masonry walls marked for demolition, and segregate and stockpile stone deemed suitable for reuse under payment items 7A, 7C,

		and/or 14B through 14D. Stone stockpiled as part of this item is not subject for payment under 7A, 7C, and/or 14B through 14D.
7A	LS	**Spillway Face Reconstruction:** Furnish all material, labor, and equipment to rebuild the collapsed spillway face.
7B	SF	**Masonry Walls Repointing:** Furnish all material, labor, and equipment to the Stone Masonry Walls.
7C	SF	**Masonry Walls/Spillway Face Re-Chinking:** Furnish all material, labor, and equipment to re-chink the Stone Masonry Walls and Spillway Face.
8A	TON	**Concrete Spillway Apron – Demolition & Disposal:** Furnish all material, labor, and equipment to remove and dispose of reinforced and unreinforced concrete scheduled for demolition along the primary spillway apron and upstream caplog. Removal of stones in the spillway to gain the required slab thickness shall be considered incidental to this bid item. Removal and disposal of demolished materials is considered incidental to this bid item
8B	CY	**Concrete Spillway Apron – Non-Structural Concrete Infill:** Furnish all materials, labor, and equipment to fill and level with non-structural concrete (same mix design as spillway apron concrete but without reinforcing) along the spillway apron to fill gaps between stones prior to placing reinforcement and structural concrete.
8C	CY	**Concrete Spillway Apron – Form, Reinforce, Anchor, Pour, Cure, & Finish Concrete:** Furnish all materials, labor, and equipment to form, reinforce, drill and grout anchors, place, finish, and cure concrete associated with the spillway apron. Installation of control joints, construction joints, and waterstops is considered incidental to this bid item.
9A	LS	**Spillway Cutoff Wall – Excavation and Backfill:** Furnish all materials, labor, and equipment to excavate, support/slope excavations, segregate/stockpile earthen material suitable for reuse, backfill, and compact to the grades shown on the plans to install the cutoff wall located immediately upstream of the primary spillway apron. Earthen materials suitable for reuse from this excavation shall be used prior to importing engineered fill material under Item 14A. Material excavated from this excavation not suitable for reuse shall be disposed of under Item 9B. Removal of excavation support is considered incidental to this item.
9B	TON	**Spillway Cutoff Wall – Upland Disposal of Excess or Unsuitable Dredge Material:** Furnish all materials, labor, and equipment to dispose of, at an off-site location, excess or unsuitable materials excavated and found to exceed state criteria, requiring upland disposal. Testing of material in accordance with the frequencies stated in the QA/QC section, for disposal shall be carried under Bid Item 2.
9C	TON	**Spillway Cutoff Wall – Disposal of Excess or Unsuitable Dredge Material:** Furnish all materials, labor, and equipment to dispose of, at an off-site location, excess or unsuitable materials excavated and found not suitable for reuse under item 13A and not requiring upland disposal. Testing discuss suite of testing required in QA/QC of material for disposal shall be completed under Item 2.
10	LS	**Abandon the Existing Low-Level Outlet:** Furnish all materials, labor, and equipment to excavate/backfill access to existing grades, clean, form, and install non-excavatable cement fill within the existing low-level outlet structure. Installation of the support of excavation and upstream closure is considered incidental to this bid item.
11A	LS	**Sluiceway Bridge & Control Structure Demolition & Disposal:** Furnish all material, labor, and equipment to demolish the stop log control structure and existing timber bridge at the existing sluiceway. Dispose of, at an off-site location, demolished materials. Cut flush with stone masonry, any components fastened into the stone masonry.
11B	LS	**Sluiceway Bridge Construction:** Furnish all material, labor, and equipment to verify dimensions, fabricate/construct, anchor, and install the footbridge over the sluiceway as

		shown on the contract documents.
11C	LS	**Sluiceway Gate Fabrication and Installation:** Furnish all material, labor, and equipment to verify dimensions, fabricate/construct, anchor, and install the sluiceway gates as shown on the contract documents. Appurtenant structures or components required to install and operate the system as stated within the Contract Documents shall be considered incidental to this bid item.
12A	LS	**Center Embankment Grouting – Mobilization, Demobilization, Grout Hole Drilling:** Furnishing all material, labor, and equipment to mobilize and demobilized equipment to: drill grout holes; install required grout piping to the specified depths; install grout; mix grouts; quantify grout volumes and weights; complete QA/QC testing; layout grout hole locations; to complete the grouting program within the center embankment section as stated within the Contract Documents. Site cleanup and off-site disposal of unused and wasted grout materials are considered incidental to this bid item. Grout that becomes hardened in topsoils shall be removed and replacement topsoil shall be imported, placed, and seeded at no additional cost.
12B	LF	**Center Embankment Grouting – Grout Hole Drilling:** Furnish all material and labor, to operate mobilized drilling equipment, drill grout holes, and install required grout piping to the specified depths to complete the grouting program.
12C	GAL	**Center Embankment Grouting – Grout Mixing & Installation:** Furnish all material and labor, to operate mobilized grouting equipment, mix grout materials in sufficient quantities to complete the grouting program, and install grout materials within the center embankment section. Measurement of grout volume by flow meter or other approved methodology is considered incidental to this bid item.
13A	LS	**Right Embankment – Excavation and Backfill:** Furnish all materials, labor, and equipment to excavate, support/slope excavations, segregate/stockpile earthen material suitable for reuse, backfill, and compact to the grades shown on the plans to complete work associated with the right embankment and low-level outlet located to the right of the primary spillway. Earthen materials suitable for reuse from this excavation shall be used prior to importing engineered fill material under Item 14A. Material excavated from this excavation not suitable for reuse shall be disposed of under Item 13C. Removal of excavation support is considered incidental to this item.
13B	CY	**Right Embankment – Rock Removal:** Furnish all materials, labor, and equipment to remove, using drilling and splitting techniques, rock required to be removed to install work as shown on the plans. The Engineer and Owner shall approve all rock removal limits prior to removal. Incidental to this bid item is the marking of areas proposed to be removed, and pre- and post-survey of rock to be removed (required for payment).
13C	TON	**Right Embankment – Disposal of Unsuitable Materials:** Furnish all materials, labor, and equipment to remove and dispose of off-site all excavated materials deemed unsuitable for reuse by the Owner or Engineer and construction debris encountered during right embankment excavation.
13D	CY	**Right Embankment – Dental Grouting:** Furnish all materials, labor, and equipment to infill with a flowable grout exposed/open joints within the excavated/exposed bedrock surface within the footprint of the proposed wall footing prior to placing reinforcement and structural concrete. Measurement of grout volume by flow meter or other approved methodology is considered incidental to this bid item.
13E	CY	**Right Embankment – Form, Reinforce, Anchor, Pour, Cure & Finish Concrete:** Furnish all materials, labor, and equipment to form, reinforce, drill and grout anchors, place, finish, and cure concrete associated with the concrete retaining wall(s) right of the primary spillway, the low-level outlet chamber, and the low-level outlet conduit cradle. Installation of control joints, construction joints, and waterstops is considered incidental to

		this bid item.
13F	LS	**Right Embankment – Incidentals:** Furnish all materials, labor, and equipment to fabricate and install items including: handrailing, hatches, wall mounted slide gates, operator stems and guides, operators, t-wrenches, manhole steps, ductile iron piping, pipe bends, pipe restraints, pre-cast intake structure, trash rack, reinforce, anchor, and other items as shown on the Contract Documents. Pull out tests as required in section 01400, and the inclusion of up to 3 structural steps (each up to 4-feet in height) to vary the footing elevation due to changes in bedrock are incidental to this bid item.
14A	TON	**Import Engineered Fill:** Furnish all materials, labor, and equipment to import and stockpile engineered fill for use on site in quantities sufficient to meet the dimensions and grades. Fill shall only be imported in quantities to supplement on-site soils for reuse, or as stated by the Owner or Engineer.
14B	TON	**Import Armor Stone:** Furnish all materials, labor, and equipment to import and stockpile armor stone in quantities sufficient to meet the dimensions and grades. Materials deemed suitable for reuse as armor stone that were stockpiled from stone masonry wall demolition shall be used prior to importing and placing armor stone.
14C	TON	**Import Riprap:** Furnish all materials, labor, and equipment to import and stockpile riprap in quantities sufficient to meet the dimensions and grades. Materials deemed suitable for reuse as riprap that were stockpiled from stone masonry wall demolition shall be used prior to importing and placing riprap.
14D	TON	**Import Bedding Stone:** Furnish all materials, labor, and equipment to import and stockpile bedding stone in quantities sufficient to meet the dimensions and grades. Materials deemed suitable for reuse as bedding stone that were stockpiled from stone masonry wall demolition shall be used prior to importing and placing bedding stone.
14E	SY	**Geotextile:** Furnish all material, labor, and equipment to install geotextile fabric material.
15	SY	**Loam and Seed:** Furnish additional imported Loam Borrow to supplement stockpiled material. Furnish all material, labor, and equipment to place and compact stockpiled and imported Loam Borrow, perform fine grading and raking. Source material testing, liming, and fertilizing is considered incidental to this bid item. Furnish all material, labor, and equipment to plant seed. Watering, establishing a healthy stand of grass, and grass maintenance during the growing season is considered incidental to this bid item. Furnish all material, labor, and equipment to grade and rake mulch.

D. Payment for equipment, materials and labor for items not included on the Bid or described in Article PAYMENT, herein, shall be considered incidental and no separate payment will be made.

1.05 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

1. Loading, hauling, and disposing of rejected material.
2. Quantities of material wasted or disposed of in manner not called for under the Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by Contractor.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by the Engineer.
6. Material remaining on hand after completion of Work.

1.06 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Final Payment: Will be made only for materials incorporated into the Work in the Contract; no partial payments shall be made for equipment or materials delivered to the site but not used.

1.07 FINAL APPLICATION FOR PAYMENT

A. Reference the General Conditions, and as may otherwise be required in the Contract Documents.

B. Prior to submitting final application, make acceptable delivery of required documents.

PART 2.00 - PRODUCTS
Not Used

PART 3.00 – EXECUTION
Not Used

END OF SECTION

SECTION 01070
ABBREVIATIONS, SYMBOLS, AND DEFINITIONS

PART 1.00 - GENERAL

1.01 STANDARD SPECIFICATIONS:

A. Wherever a reference is made to any standard specifications, it shall mean the most recent specification, code, standard or tentative specification of the organization referred to, and these standard specifications shall be considered a part of these Contract Documents to the extent indicated. Abbreviations which may be used refer to the following organizations:

1. AA Aluminum Association
2. AAMA Architectural Aluminum Manufacturers Association
3. AASHTO American Association of State Highway and Transportation Officials
4. ACI American Concrete Institute
5. AISC American Institute of Steel Construction
6. AISI American Iron and Steel Institute
7. ANSI American National Standards Institute
8. ASTM American Society for Testing and Materials
9. AWPA American Wood Preservers Association
10. AWS American Welding Society
11. RIDEM Rhode Island Department of Environmental Management
12. RIDOT Rhode Island Department of Transportation
13. NFPA National Fire Protection Association
14. OSHA Occupational Safety and Health Administration
15. PTI Post-tensioning Institute
16. UL Underwriter's Laboratory

1.02 DEFINITIONS

A. General: A substantial amount of specification language consists of definitions of terms found in other Contract Documents, including the Drawings. Certain terms used in Contract Documents are defined in this article. Definitions and explanations contained in this section are not necessarily either complete or exclusive, but are general for the Work to the extent that they are not stated more explicitly in another element of the Contract Documents.

1. Construction Documents: Refers to the contract documents inclusive of the Contractors Bid, the Contract, General Conditions, Supplementary Conditions, Technical Specifications, Permits, and Construction Drawings

B. Owner of the Dam: The Rhode Island Department of Environmental Management (RIDEM) is the current owner of the property and is referred to as Owner in the Contract Documents.

C. Engineer: Refers to the engineer of record, Pare Corporation (Pare) of Foxboro, Massachusetts and its representatives.

D. Regulatory Agencies: Refers to the following agencies having jurisdiction over all or part of the work:

1. Rhode Island Department of Environmental Management
2. Army Corps of Engineers

E. Work: Refers to all construction activities associated with the Wyoming Upper Reservoir Dam Repairs as specified in the Contract Documents and specified herein.

F. Components of the Dam:

1. Upstream – Generally refers to the area on the northeast side of the dam where the Wood River is impounded by the dam structure.

2. Downstream – Generally refers to the area on the southwest side of the dam where the Wood River flows away from the structure.

3. Right – Shall mean the area to the right when looking in the downstream direction.

4. Left – Shall mean the area to the left when looking in the downstream direction.

5. Left Embankment – Shall mean the roughly 100-foot wide swath of land on the left side of the dam that makes up the Wyoming Dam Fishing Access.

6. Center Embankment – Shall mean the roughly 13-foot wide swath of land contained by stone masonry walls between the sluiceway and the spillway.

7. Right Embankment – Shall mean the roughly 85-foot wide swath of land on the right side of the dam located between the spillway and Prospect Square.

8. Spillway – Shall mean the roughly 180-foot long structure over which water flows are discharged.

9. Existing Low Level Outlet – Shall mean the roughly 4 foot wide by 5 foot tall stone masonry conduit through which water flows are discharged. This structure is located roughly 30 feet left of the right end of the spillway.

10. Sluiceway – shall mean the roughly 13-foot wide stone masonry lined open channel through which water flows are discharged. This structure is located between the left and center embankments.

11. Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions. Refers to elevation 96.3 feet. Elevations reference NAVD88.

12. 100-year Elevation[1] – Refers to elevation 99.2 feet. Elevations reference NAVD88. Flow associated with this event is 2620 cfs.

13. 10-year Elevation[1] – Refers to elevation 98.2 feet. Elevations reference NAVD88. Flow associated with this event is 1360 cfs.

[1] Flow rates based off of USGS Streamstats regression data for the drainage area delineated at the Wyoming Upper Reservoir Dam. Streamstats Values were corroborated (within 10% of one another) using transposition ratios comparing the drainage areas and flow rates associated with the 10% and 1% annual exceedance interval storm events as measured by the USGS stream gauges at Stations 01118000 (Wood River at Hope Valley, RI) and 01117800 (Wood River near Arcadia, RI). Elevations assume the full width of the spillway is available to pass flow

14. Seasonally appropriate base flows – Shall be defined as the following:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Seasonally Appropriate Base Flow, CFS[2]	130	154	190	196	130	74.6	42.2	31.8	32.4	40.5	75.1	121

15. Construction Pool Elevation - Refers to approximately elevation 91.0 feet and is the approximate controlling elevation at the sluiceway. Elevations reference NAVD88. Note the construction pool elevation is the lowest permitted water elevation and based on required seasonally appropriate flows, may not be possible to achieve without additional diversion devices beyond the sluiceway.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 – EXECUTION

Not Used

END OF SECTION

[2] Based on the "Modified Aquatic Base Flow (RI-ABF) for Rhode Island" Prepared by Alisa R. Richardson, P.E., RIDEM Office of Water Resources, March 2005. From Appendix A, Referencing RI01118000 for a 57.8 square mile drainage basin.

SECTION 01200
PROJECT MEETINGS

PART 1.00 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Owner or Owner's Representative shall schedule and administer the preconstruction conference. The Owner or Owner's Representative shall:

1. Prepare the agenda for the meeting.
2. Notify all parties required to attend meeting.
3. Make physical arrangements for meeting.
4. Preside at meeting.
5. Record the minutes, including significant proceedings and decisions.
6. Reproduce and distribute copies of minutes within three (3) calendar days after the meeting to participants in the meeting and other parties affected by decisions made at the meeting.

B. The Owner or Owner's Representative shall schedule and administer periodic progress meetings, and specially called meetings throughout the progress of the Work. The Owner or Owner's Representative shall:

1. Prepare agenda for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes, including significant proceedings and decisions.
5. Reproduce and distribute copies of minutes within three (3) calendar days after each meeting to participants in the meeting and other parties affected by decisions made at the meeting.

C. Representatives of Contractors, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 PRE-CONSTRUCTION CONFERENCE

A. Attendance:

1. Owner and/or Representative.
2. Resident project Representative.
3. Contractor's superintendent.
4. Major Subcontractors.
5. Major suppliers.
6. Others as appropriate.

B. Suggested Agenda:

1. Distribution and discussion of
   a. List of major Subcontractors and suppliers.
   b. Projected construction schedules.
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project coordination.

a. Designation of responsible personnel.
5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change orders.
   e. Applications for payment.
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining record documents.
8. Use of premises:
   a. Office, work and storage areas.
   b. Owner's requirements.
9. Construction facilities, controls, and construction aids.
10. Traffic Maintenance Plan.
11. Temporary utilities.
12. Safety and first-aid procedures.
13. Security procedures.
14. Housekeeping procedures.
15. Place, date, and time for regular progress meetings.

1.03 PROGRESS MEETINGS

A. Conduct, at most, scheduled weekly progress meetings (meeting schedule may be adjusted at the Owner’s discretion) at a place and time agreed upon at Pre-Construction Conference.

B. Conduct additional meetings as progress of the Work dictates.

C. Attendance:

1. Engineer and his/her professional consultants as needed.
2. Owner or Representative, when required.
3. Contractor's superintendent.
4. Subcontractors as appropriate to the agenda.
5. Suppliers as appropriate to the agenda.
6. Others.

D. Suggested Agenda:

1. Review approval of minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, and conflicts.
4. Problems which impede construction schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to construction schedule.
8. Progress schedule during succeeding work period.
9. Maintenance of quality standards.
10. Pending changes and substitutions.
11. Coordination of schedules.
12. Review submittal schedules; expedite as required.

13. Review proposed changes for:
    a. Effect on construction schedule and on completion date.
    b. Effect on subcontracts of the project.
14. Other business.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULES

PART 1.00 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. At least three (3) calendar days before the scheduled Pre-Construction Conference, prepare and submit to Owner or Owner's Representative the initial construction schedule for the Work, with sub schedules, if required, of related activities that are essential to its progress.

B. Submit revised progress schedules with the submission of each payment request.

1.02 FORM OF SCHEDULES

A. Prepare schedules using Microsoft Project (V.4.0 or later) in the form of a horizontal bar chart.

B. Provide a separate horizontal bar for each item of work that matches verbatim the breakdown of the contract price toward which partial payments will be made to the Contractor.

C. Horizontal Time Scale: Identify the first workday of each week.

D. Scale and Spacing: To allow space for notations and future revisions.

E. Minimum Sheet Size: 8-1/2" by 11".

1.03 CONTENT OF SCHEDULES

A. Construction Progress Schedule: Include the following:

1. The name of the project and name and address of the Contractor.
2. The name and address of the Owner.
3. Date indicating the end of the construction period being reported.
4. Legend showing a solid line representing estimated construction and a dotted line representing actual construction.
5. Columns showing the percentage of the total contract of each item, the percentage of completion to date of each item and the weighted percentage of completion of each item to the project as a whole.
6. Starting and completion dates of the contract.
7. Projected percentage of completion for each item, as of the first day of each month.

B. Submittals Schedule for Shop Drawings, Product Data and Samples: Show the following:

1. The dates for Contractor's submittals.
2. The dates reviewed submittals will be required from the Engineer/Owner.

1.04 MONTHLY PROGRESS REPORTS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.

2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime Contractors.

1.05 SUBMISSIONS

A. Submit initial schedule at least three (3) calendar days before the scheduled Pre-Construction Conference.

1. Owner will review schedule prior to the scheduled Pre-Construction Conference.
2. If required, resubmit within three (3) calendar days after return of review copy.

B. Submit revised progress schedules with each application for payment.

C. Submit initial schedule and schedule updates in accordance with Section 01340 Submittals.

1.06 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Job site file.
2. Subcontractors.
3. Other concerned parties.

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, and Division-1 Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

A. General: This section specifies procedural requirements for non-administrative submittals including shop drawings, product data, samples and other miscellaneous work-related submittals. Shop drawings, product data, samples and other work-related submittals are required to amplify, expand and coordinate the information contained in the Contract Documents.

1. Refer to other Division-1 sections and other Contract Documents for specifications on administrative, non-work-related submittals. Such submittals include, but are not limited to the following items:
   a. Permits.
   b. Written consents.
   c. Manifests
   d. Payment applications.
   e. Performance and payment bonds.
   f. Insurance certificates.
   g. Inspection and test reports.
   h. Progress reports.
   i. Listing of Subcontractors.
   j. Construction schedules.

B. Shop drawings are technical drawings and data that have been specially prepared for this project, including but not limited to the following items:

1. Fabrication and installation drawings.
2. Coordination drawings (for use on-site).
3. Schedules.
4. Design mix formulas.
5. Where verification of existing conditions is required to fabricate/construct an element; the Contractor shall provide a letter along with the submittal stating that the conditions have been verified.

C. Product data includes standard printed information on manufactured products that has not been specially-prepared for this project, including but not limited to the following items:

1. Manufacturer's product specifications and installation instructions.
2. Catalog cuts.
3. Roughing-in diagram and templates.
4. Standard wiring diagrams.
5. Printed performance curves.
6. Operational range diagrams.

D. Samples are physical examples of work, including but not limited to the following items:

1. Partial sections of manufactured or fabricated work.
2. Small cuts or containers of materials.
3. Complete units of repetitively-used materials.

E. Miscellaneous submittals are work-related, non-administrative submittals that do not fit in the three previous categories, including, but not limited to the following:

1. Specially-prepared and standard printed warranties.
2. Project photographs.
3. Testing and certification reports.
4. Record drawings.
5. Field measurement data.
6. Keys and other security protection devices.

1.03 SUBMITTAL PROCEDURES

A. General: Refer to the General Conditions for basic procedures for submittal handling.

B. Coordination: Coordinate the preparation and processing of submittals with the performance of the work. Coordinate each separate submittal with other submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity.

1. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the Engineer/Owner/Owner's Representative need to review a related submittal. The Engineer/Owner/Owner's Representative reserves the right to withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.

C. Scheduling: In each appropriate administrative submittal, such as the progress schedule, show the principal work-related submittals and time requirements for coordination of submittal activity with related work.

D. Coordination of Submittal Times: Prepare and transmit each submittal to the Engineer/Owner sufficiently in advance of the scheduled performance of related work and other applicable activities. Transmit different kinds of submittals for the same unit of work so that processing will not be delayed by the Engineer/Owner's need to review submittals concurrently for coordination.

E. Review Time: Allow sufficient time so that the installation will not be delayed as a result of the time required to properly process submittals, including time for resubmittal, if necessary. Advise the Engineer/Owner on each submittal, as to whether processing time is critical to the progress of the work, and if the work would be expedited if processing time could be shortened.

1. Allow seven (7) calendar days for the Engineer/Owner's initial processing of each submittal. Allow a longer time period where processing must be delayed for coordination with subsequent submittals. The Engineer/Owner will advise the Contractor promptly when it is determined that a submittal being processed must be delayed for coordination.
2. Allow five (5) calendar days for reprocessing each submittal.
3. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer/Owner sufficiently in advance of the work.

F. Submittal Preparation: Mark each submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken.

1. Project name.
2. Date.
3. Name and address of Owner.
4. Name and address of Contractor.
5. Name and address of supplier.
6. Name of manufacturer.
7. Number and title of appropriate specification section.
8. Drawing number and detail references, as appropriate.
9. Similar definitive information as necessary.
10. Provide a space on the label for the Contractor's review and approval markings, and a space for the Engineer/Owner's "Action" marking.
11. Submittals shall be titled "16226.00_WyomingDamRepairs_SubmittalNo.XX-xxxxxxxxxxxxx".
    a. Where "XX" is the designated submittal Number.
    b. Where "xxxxxxxxxxxxx" is a short description of the submittal content.

G. Electronic Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit one (1) copy, including a transmittal form to the Contractor's Folder on the Pare File Transfer Protocol site. Emailed submittals shall be sent to the Engineer in the same format. Prepare a separate transmittal form for each division of work and identify each submittal by specification section number on the transmittal form.

2. Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, including minor variations and limitations.
3. Include the Contractor's signed certification stating that information submitted complies with requirements of the Contract Documents.
4. Sequentially number the transmittal forms; resubmittals to have original number with an alphabetic suffix.
5. Where appropriate, submittals shall be in Adobe PDF format. Where appropriate, File formats shall be compatible with Microsoft Office 2010.
6. In the event of a discrepancy between the electronically transmitted submittal and the hardcopy, the hardcopy shall prevail.
7. Contractor shall be responsible for notifying Engineer in writing when new submittals are posted to the FTP site.
8. Emailed submittals shall be limited to one submittal per email.
9. Emailed submittals shall be titled "16226.00_WyomingDamRepairs_SubmittalNo.XX-xxxxxxxxxxxxx".
    a. Where "XX" is the designated submittal Number.
    b. Where "xxxxxxxxxxxxx" is a short description of the submittal content.
10. Emailed submittals must be confirmed as received by the Engineer through either but not limited to a read receipt or confirmatory email.

H. Contractor Review: Stamp of approval indicates to Owner and Engineer/Owner that all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data

have been determined and verified, and that each submittal has been reviewed or coordinated with requirements of work and Contract Documents.

I. No portion of Work requiring shop drawings shall be started or any materials be fabricated, delivered to site, or installed prior to approval of such items. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at Contractor's risk. Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

J. Project work, materials, fabrications, and installation shall conform to approved shop drawings.

1.04 SPECIFIC SUBMITTAL REQUIREMENTS

A. Miscellaneous Submittals:

1. Inspection and Test Reports: Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.
2. Survey Data: Provide copies of all survey data collected for property surveys, field measurements, quantitative records of actual work, damage surveys and similar data required by the individual sections of these specifications. None of the specified copies will be returned.
3. Standards: Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Engineer/Owner's use. Where workmanship, whether at the project site or elsewhere, is governed by a standard, furnish additional copies of the standard to installers, Owner’s field representative, and others involved in the performance of the work.
4. Closeout Submittals: Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information, materials, tools, and similar items.
   a. Record Documents: Furnish set of original documents as maintained on the project site.
5. General Distribution: Provide additional distribution of submittals to Subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for the proper performance of the work. Include such additional copies of submittals in the transmittal to the Engineer/Owner where the submittals are required to receive "Action" marking before final distribution. Record distributions on transmittal forms.

B. Verification of Existing Conditions: Where verification of existing conditions is required to fabricate/construct an element; the Contractor shall provide a letter along with the submittal stating that the conditions have been verified.

1.05 ENGINEER/OWNER'S ACTION

A. General: Except for submittals for the record and similar purposes, where action and return on submittals is required or requested, the Engineer/Owner will review each submittal, mark with appropriate "Action", and where possible return within seven (7) calendar days of receipt. Where

the submittal must be held for coordination the Engineer/Owner will so advise the Contractor without delay.

B. Action Stamp: The Engineer/Owner will stamp, sign and date each submittal copy to be returned to Contractor and indicate disposition of each submittal in accordance with the following grading requirements:

1. "No Exceptions Taken" indicates that Engineer/Owner notes no exception to the intent of the Contract Documents. Fabrication of item may commence.
2. "Furnish as Corrected" indicates that with minor corrections or additions, Engineer/Owner notes no exception to the intent of the Contract Documents. Item may be fabricated on basis of corrections noted. No further checking will be required.
3. "Revise and Resubmit". No fabrication may commence.
4. "Rejected" indicates nonconformance with the contract requirements, or that too many corrections would be necessary. The Engineer/Owner will state the reasons for rejections.
5. “Submit Specified Item” indicates missing portions of the submissions. Fabrication may commence upon submission and approval of specified item.
6. “Reviewed” indicates that the Engineer/Owner has received and processed the submittal. No determination of conformance was completed/necessary.

C. Engineer/Owner Review:

1. Engineer/Owner's review of submitted drawings and data will cover only general conformity to drawings and specification, external connections, and dimensions which affect layout.
2. Engineer/Owner's review does not indicate thorough review of all dimensions.
3. Engineer/Owner's review of submittals does not relieve Contractor's responsibility for errors, omissions, or deviations, nor responsibility for compliance with Contract Documents.

1.06 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Engineer/Owner and resubmit until they are denoted "No Exceptions Taken" or "Furnish as Corrected" by the Engineer/Owner. Resubmission requirements specified in individual specification sections, which differ from these requirements, will take precedence over these requirements.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Engineer/ Owner.

C. Samples: Submit new samples as required for initial submittal.

1.07 DISTRIBUTION

A. Distribute reproductions of shop drawings and copies of product data which carry the Engineer’s stamp denoting "No Exceptions Taken" or " Furnish as Corrected" to:

1. Job site file.
2. Record documents file.
3. Subcontractors.
4. Supplier or fabricator.

B. Distribute samples which carry the Engineer/Owner's stamp denoting "No Exceptions Taken" or "Furnish as Corrected" as directed by the Engineer/Owner.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01400
QUALITY CONTROL/QUALITY ASSURANCE

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

A. Quality Control that the Contractor will perform during the performance of this work.

B. Quality Assurance that the Owner will perform during the performance of this work.

1.02 SUBMITTALS

A. Submit Quality Control Plan to the Owner/Owner's Representative at least three (3) calendar days before starting work which includes the following information:

1. Statement and description of Contractor's overall Quality Control (QC) program as described below. Each Sub-contractor shall submit a separate QC program applicable to their scope of work to the Contractor.
2. Procedures to be used in obtaining field samples of materials except where required for submittal under other sections.
3. Name, qualifications, and prior experience of inspection and testing laboratories that Contractor proposes for Owner/Owner's Representative's consideration.

1.03 QUALITY CONTROL (QC) PROGRAM

A. Formulation, Submission, Details and Acceptance of Plan:

1. Contractor shall develop a QC program appropriate to the scale of the project.
2. The plan shall identify personnel, and establish procedures, instructions, records, and forms to be used.
3. The Contractor's QC Plan shall include as a minimum, the following:
   a. A description of the Contractor's QC organization, including a chart showing lines of authority, and acknowledgement that the Contractor's QC staff shall conduct inspections for all aspects of the work specified.
   b. The name, qualifications, responsibilities, and authority of each person assigned to the Contractor's QC function.
   c. Procedures for scheduling and managing submittals, including those of Subcontractor, fabricators, suppliers, and purchasing agents.
   d. Control procedures to be promulgated.
   e. Control testing procedures for each specific test, including field sampling.
   f. Reporting procedures including proposed reporting formats.
3. Acceptance of Plan: Acceptance of the Contractor's plan by the Owner/Owner's Representative is required prior to the start of construction. Acceptance is conditional, and its continuation will depend on satisfactory performance by the Contractor during construction. The Owner/Owner's Representative reserves the right to require the Contractor to make changes in the Contractor's QC Plan and operations as necessary to obtain the quality specified at no additional cost to the Owner.
4. Notification of Changes: After acceptance of the Contractor's QC Plan, the Contractor shall notify the Owner/Owner's Representative in writing of any proposed change. The proposed changes will be subject to acceptance by the Owner/Owner's Representative.

B. Implementation of QC Plan:

1. General:
   a. Comply with the highest industry standards except when specified requirements indicate more rigid standards, or more precise workmanship is required.
   b. Provide personnel to produce work of specified quality.
   c. Secure, protect, and maintain products and Work completed or in progress from damage during the progress of remaining Work.
2. Preparatory Inspection: This shall be performed prior to beginning any segment of Work. It shall include a review of Contract requirements; a check to assure that all materials and or equipment are on hand, and have been tested, samples submitted and approved; a check to assure that provisions have been made to do required control testing; examination of the work that has been completed; and a physical examination of materials, equipment and sample work to assure that they conform to approved shop drawings or submittal data. Contractor shall instruct each Subcontractor contributing work as to the acceptable level of workmanship required in the Contractor's QC Plan in order to meet Specifications.
3. Initial Inspection: This shall be performed as soon as a representative portion of a particular segment of Work has been accomplished, and shall include examination of the quality of workmanship and materials, a review of control testing for compliance with Contract requirements, and inspection for omissions and dimensional requirements.
4. Follow-up Inspections: These shall be performed regularly to assure continuing compliance with Contract requirements, including control testing, until Completion. Final follow-up inspections shall be conducted and deficiencies corrected prior to final acceptance of segments of Work.
5. Tests: A list of QC tests, and the frequency of their performance, which the Contractor understands he is to perform, and on which he is to submit reports shall satisfy the requirements described under 3.03(B) of this section.
6. Prompt turn-around is required for all analyses, so as not to jeopardize the project schedule. Verbal turn-around time on soil samples is not to exceed 48 hours and written turn-around time is not to exceed 72 hours.
7. The Contractor shall submit the list of tests, and the frequency of their performance, as a part of the Contractor's QC Plan, to the Owner/Owner's Representative. The list shall give the test name, Specification Paragraph containing the test requirements, and the personnel and laboratory responsible for each type of test. The Contractor shall perform the following activities:
   a. Verify that testing procedures comply with Contract requirements.
   b. Verify that facilities and testing equipment are available and comply with testing standards.
   c. Check test instrument calibration data against certified standards.
   d. Verify that recording forms, including all of the test documentation requirements, have been prepared.
8. Testing for Laboratory Capability:
   a. Capability Check: Owner/Owner's Representative shall have the right to check laboratory equipment in proposed laboratories for compliance with testing procedures.
   b. Capability Rechecks: If the selected laboratory(ies) fails the capability check the Contractor shall be assessed actual costs to reimburse the Owner/Owner's Representative for each succeeding recheck of the laboratory or the checking of a subsequently-selected laboratory.
9. Documentation:

a. The Contractor shall maintain records of QC operations, activities and tests performed including the work of suppliers and Subcontractors. These records shall be on an acceptable form and shall include a description of the trades working on the project, the number of personnel working, weather conditions encountered, and delays encountered, and acknowledgement of deficiencies noted along with corrective actions taken on current or previous deficiencies. Additionally these records shall include evidence that required activities or tests have been performed, including but not limited to the following:
   i. Type and number of control activities and tests performed.
   ii. Results of control activities or tests, including nature of any defects, causes for rejection, and other information related to deficient features.
   iii. Proposed remedies and accomplished corrections.
b. These records shall cover both conforming and defective features, and shall include a statement that supplies and materials incorporated in the Work comply with the Contract requirements. Legible copies of these records shall be submitted to the Owner/Owner's Representative.
c. Notification of Noncompliance: Owner/Owner's Representative will notify the Contractor or his designated representative of any observed noncompliance with requirements of this Section. If the Contractor fails or refuses to comply promptly, the Owner/Owner's Representative may issue an order stopping all or part of the Work until satisfactory corrective action has been taken.

1.04 QUALITY ASSURANCE (QA) PROGRAM

A. The Contractor shall provide for all costs associated with implementing a QA testing program within the bid price for General Requirements.

B. In general, QA testing will be performed at a frequency equal to about 10 percent of the QC testing frequency or as directed by the Owner/Owner's Representative.

1.05 WEIGHTS AND MEASURES

A. The Contractor shall weigh and measure its own materials.

B. Give one copy of each delivery's weight or measurement to Owner/Owner's Representative prior to stockpiling or storage.

1.06 REFERENCE STANDARDS

A. Where reference to an industry standard does not include a date of issue, conform to issue current as of date of Contract Documents.

B. Where reference to an industry standard includes a date of issue, conform to issue current as of the date specified.

1.07 INSPECTION AND TESTING LABORATORIES

A. Independent testing laboratories shall perform inspections, tests, and other services specified in individual specification sections, the Contractor's Quality Control Plan, and as required for QA by the Owner/Owner's Representative.

B. Reports and test results shall be submitted by the independent testing laboratory directly to the Owner, indicating observations and results of tests and indicating compliance or noncompliance with the requirements of the specifications.

C. Contractor shall provide access to the work and fully cooperate with laboratory firms. Notify Owner at least 48 hours prior to expected time when work is ready for inspection, sampling, or testing, if not otherwise specified for the particular work to be tested.

D. Retesting required due to nonconformance to specified requirements shall be performed by the same independent testing laboratories on instructions from the Owner/Owner's Representative. Retesting costs shall be borne by the Contractor and will not be applied to any unit price items.

PART 2.00 – PRODUCTS

2.01 MATERIALS

A. See applicable Specification Sections for types of material and equipment used on this project.

PART 3.00 – EXECUTION

3.01 PRECONSTRUCTION TESTING

A. Prior to construction, identify sources for soil, rock, and bituminous materials and test samples of each material from each source to determine whether they meet the required material specifications.

B. Document all tests. Soil, rock, and bituminous materials shall be accepted or rejected according to the test results. Some or all of the following tests shall be performed in the evaluation of the material properties for construction purposes:

1. ASTM D422 – Particle Size Analysis
2. ASTM D1557 – Moisture/Density Relationship
3. ASTM D2216 – Moisture Content
4. ASTM D2488 – Unified Soils Classification
5. ASTM D854 – Specific Gravity

C. All material evaluation tests shall be performed by the independent testing laboratory retained by the Contractor and approved for use by the Owner/Owner's Representative.

3.02 CONSTRUCTION TESTING

A. Document all tests. Some or all of the following tests shall be performed in the evaluation of the in place properties of soil and rock materials.

1. ASTM C31 – Making and Curing Test Specimens in the Field
2. ASTM C39 – Compressive Strength of Cylindrical Concrete Specimens
3. ASTM C143 – Concrete Slump Test

4. ASTM D422 – Particle Size Analysis
5. ASTM D1557 – Moisture/Density Relationship
6. ASTM D2216 – Moisture Content
7. ASTM D1556 – Density of Soil in Place by Sand-Cone Method
8. ASTM D2216 – Laboratory Determination of Water Content
9. ASTM D2922 – Density of Soil in Place by Nuclear Methods
10. ASTM D3017 – Water Content of Soil in Place by Nuclear Methods

B. Further material testing may be necessary if alternative sources of material are required during construction or, if based on visual inspection during delivery to the site, it appears that a material change (color, grain size, plasticity) has occurred. Additional source testing due to change of material shall be borne by the Contractor and will not be applied to any unit price items.

C. Questions concerning the accuracy of any single test shall be addressed by retesting.

3.03 QC TESTING FREQUENCY

A. All QC testing shall be conducted in accordance with the Contractor's QC Plan. Documentation and reporting of test results shall be the responsibility of the Contractor.

B. Testing frequencies for material evaluation and construction quality evaluation are presented in the following table.

Material / Product	Responsible Party	Situation	Test	Minimum Frequency
Gravel Borrow/Regrading Fill	Contractor	Source Investigation	Grain Size through 0.002 mm Moisture Density Relationship Soil Permeability	1 per source 1 per source 3 per source
	Contractor	During Placement	Grain Size through 0.002 mm Moisture Density Relationship	1 per 100 tons 1 per 100 tons
	Contractor	As-Placed	Dry Density and As-Placed Moisture	2 per lift per location and no less than 1 every 500 sf
Unsuitable Dredge Material for Disposal	Contractor	After Excavation	Total Metals, PCBs, PAHs, TPH, EPH, Percent Volatile Solids	Per Phase of Excavation
Loam Borrow	Contractor	During Placement	PH, Nitrogen, Phosphorous, Potassium, and USDA Classification	2 per Acre
Riprap	Contractor	Source Investigation	Source Material Certification Specific Gravity	1 per source per type 1 per source per type
	Contractor	During Placement	Source Material Certification Specific Gravity	1 per 500 tons 1 per 500 tons
Concrete	Contractor	As-Placed	Strength, Slump, Air Entrainment, Temperature	See Section 03300
Grout	Contractor	As-Placed	Strength, Temperature	At the start of each day of grouting and per every 1000 gallons installed each day.
Rock Anchors	Contractor	Initial Test, Production Confirmation	Pull out strength	At a rate of 2% of total number of rock anchors installed, not less than 2 tests
Low-Level Outlet and Sluiceway Gates	Contractor	After Installation	Leak Test At Normal Pool Head Conditions	1 per Gate
Low-Level Outlet and Sluiceway Gates	Contractor	After Installation	Operability along Full Range of Motion	5 times per Gate

C. Sampling locations shall be approved by the Owner/Owner's Representative.

D. A special testing frequency shall be used at the discretion of the Owner/Owner's Representative when visual observations of construction performance indicate a potential problem. Additional testing for suspected areas shall be considered when:

1. Materials appear substantially different from those specified
2. Directed by the Owner/Owner's Representative

E. During construction, the frequency of testing may also be increased in the following situations:

1. Adverse weather conditions
2. Breakdown of equipment
3. Material fails to meet specification

3.04 QA TESTING FREQUENCY

A. In general, QA testing will be performed at a frequency equal to about 10 percent of the QC testing frequency or as directed by the Owner/Owner's Representative.

3.05 DEFICIENCIES

A. If a defect is discovered, the Contractor shall immediately determine the extent and nature of the defect.

1. If the defect is indicated by unsatisfactory test results, the Contractor shall determine the extent of the deficient area by additional tests, observations, a review of records, or other means that the Contractor deems appropriate. Costs for additional testing shall be borne by the Contractor and not applied to any unit price items.
2. If the defect is related to adverse site conditions, such as overly wet soils or surface desiccation, the Contractor shall define the limits and nature of the defect.

B. After determining the extent and nature of a defect, the Contractor shall notify the Owner/Owner's Representative and schedule for defect repair and retesting.

C. The Contractor shall correct the deficiency to the satisfaction of the Owner/Owner's Representative. If the project specification criteria cannot be met, or if unusual weather conditions hinder work, then the Contractor shall develop and present to the Owner/Owner's Representative suggested solutions for his approval.

D. All retests by the Contractor must verify that the defect has been corrected before any additional work is performed by the Contractor in the area of the deficiency. The Contractor shall also verify that all installation requirements are met and that all required submittals are provided.

END OF SECTION

16226.00 **SECTION 01500**
05/2020 **TEMPORARY CONSTRUCTION FACILITIES**

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, and Division-1 Specification Sections, apply to work of this section.

1.02 REQUIREMENTS INCLUDED

A. Furnish, install and maintain temporary construction facilities required for construction, **as required by the Contractor's means and methods**, and remove at completion of work. This specification does not require that such facilities be provided; however, any facilities installed shall meet the minimum requirements specified herein.

B. Section includes but is not limited to requirements for:

1. Field offices.
2. Miscellaneous construction facilities.
3. Temporary utility connections.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and Local Codes, Laws, Ordinances, and Regulations and with utility company requirements.

1.04 SUBMITTALS

A. Submit drawings within seven (7) calendar days of starting work to Engineer for approval, showing layout, furnishings, and facilities of field office trailer and information concerning how Contractor proposes to furnish utilities.

1. Layout to include a minimum of 2 parking spaces for exclusive use of Owner and Engineer.

1.05 JOB CONDITIONS

A. Scheduled Uses: Provide temporary construction facilities at time first needed at the site; and maintain, expand and modify facilities as needed throughout construction period.

B. Conditions of Use: Operate, maintain, control and protect support facilities in a manner which will prevent fire, hazardous exposures, health problems, unsanitary conditions, pollution, contamination, discomfort to users, flooding, freeze-up, interference with construction work, public nuisances and similar deleterious effects.

C. The Owner is not responsible for damage to any or all facilities due to severe natural occurrences, vandalism, or negligence on the part of the Contractor. The Contractor shall take all necessary precautions to protect and deter potential theft and vandalism within the construction site.

1.06 COSTS

A. Include all costs associated with furnishing, installing and removing Engineer's and Contractor's field offices, and providing all utilities, equipment, furnishings, services, maintenance, and removal.

B. Include all costs for providing continuous electric, water, sewer, heating/air conditioning, and telephone services to offices throughout construction period.

PART 2.00 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

B. Coordinate interruptions of permanent utilities with utility companies and affected users.

C. Contractor's Office:

1. The Contractor shall provide its own field offices and such other temporary housing as it may need for storage or fabrication purposes and completely remove at the completion of the work.
2. Provide storage space for all shop drawing submittals, project samples, field laboratory test data and analyses, and other project related information.
3. Store all documents in fire-proof, lockable cabinets.
4. The Contractor and Subcontractors shall arrange for and have installed a telephone or provide phone(s), internet services, electrical service, and water service for the use of their own field offices and personnel.
5. The Contractor shall allow the Owner and Owner’s representatives to use the field offices for project specific tasks.

2.02 MISCELLANEOUS CONSTRUCTION FACILITIES

A. Storage Sheds:

1. General: Install individual storage sheds as required by the contractor to accommodate the work; sized, furnished and equipped properly. Sheds are defined to include both open shelters and fully enclosed spaces.
2. Chain link fence be installed around all construction facilities and staging areas as required to prevent damage and loss of construction equipment and materials due to vandalism and trespassing.

B. Sign Materials: Except as otherwise indicated, provide exterior type plywood of sizes and thickness indicated. Provide exterior-grade acrylic-latex-base enamel for painting sign panels and applying required graphics.

C. Temporary Fencing: Install temporary fencing as necessary to protect the contractor’s property from vandalism. Temporary fencing and other controls shall also be installed as necessary to secure the site and prevent public access to work areas.

D. Temporary Site Access and Staging Areas

1. Access and staging areas shall be established within the open areas at the Wyoming Dam Fishing Access off of Bridge Street or the open areas downstream of the dam between the downstream channel and Prospect Square.
2. Temporary roadways to the spillway area shall be established within permitted boundaries and within dry areas. Equipment shall not be allowed to contact impounded or flowing waters of the Wood River.
3. Contractor shall implement temporary roadway improvements and use construction access roadways as shown within the contract documents and as necessary to maintain the stability of the access roadways throughout construction.
4. Any boulders that are moved, grassed areas, gravel paths, gravel parking areas, or roadways that are disturbed to facilitate construction shall be returned to the pre-construction conditions or better at the Contractor's own expense.

B. Sign Materials:

1. Except as otherwise indicated, provide exterior type plywood of sizes and thickness indicated. Provide exterior-grade acrylic-latex-base enamel for painting sign panels and applying required graphics.
2. Provide necessary signage in accordance with all applicable standards and regulations. Signage shall include but is not limited to:
   a. DEM Permit File number sign
   b. Traffic control signs

PART 3.00 - EXECUTION

3.01 INSTALLATION OF SUPPORT FACILITIES

A. General: Use qualified tradesmen for installation of support facilities. Locate facilities where they will serve the total project construction work adequately, and result in minimum interference with performance of the work. Relocate, modify and extend facilities as required during course of the work, to properly accommodate entire work of project. Locate field offices for easy access to construction work, and positioned so that windows give best possible view of construction activities. Provide a reasonably neat and uniform appearance in support facilities, acceptable to Engineer, and to Owner.

B. Maintain and operate temporary utility systems to assure continuous service.

C. Modify and extend temporary utility systems as work progress requires.

3.02 INSTALLATION

A. Contractor's Office:

1. Install office at or near site of work. Office to be headquarters of authorized representative to receive drawings, instruction or other communication or articles.

2. Contractor to keep copies of drawings, specifications and other Contract Documents at office at site of work and make readily available for Owner or Owner's representative's use at all times.

B. Connect field offices to temporary utilities as required. Include backfill to connect telephone, electric, water and sewer utility lines; if applicable, insulate and heat the water and sewer lines to the extent necessary to prevent freezing. All sewer, water, electric, and telephone services shall be continuously connected and in proper working order.

C. Project Identification and Temporary Signs:

1. General: Install project identification sign in size and with graphics content indicated at a location approved by the Owner or Owner's Representative. Support sign on suitable posts and framing of treated wood or steel, unless otherwise indicated. Maintain sign throughout construction period in a manner which will properly inform both the public and persons seeking entrance to project. Do not allow installation of other unauthorized signs which are made visible to persons outside project area.
2. Engage an experienced sign painter to apply required graphics, in a neat professional manner.

3.03 MAINTENANCE

A. Field offices to be maintained in a clean condition.

B. Maintain adequate supply of paper towels, paper cups, toilet paper, soap and other supplies as required by the Engineer.

C. Janitorial Services:

1. Toilet facilities to be cleaned and disinfected daily.
2. Keep at least two (2) full drinking water bottles on hand at all times.
3. Replenish all supplies as required by Engineer.

3.04 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Upon completion of work of all trades and before final acceptance of entire project, each trade shall remove, at it's own expense, all wiring, appurtenances and accessories used in performance of its respective work.

C. Temporary sheds, utilities, barricades, signs, and other appurtenances related to prosecution of the work and not incorporated in the permanent construction shall be completely removed from the site prior to acceptance of work by Owner.

END OF SECTION

SECTION 01510
TEMPORARY UTILITIES

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Provisions of Contract, and Division 1 Specification Sections, apply to work of this section.

1.02 REQUIREMENTS INCLUDED

A. Furnishing, installing, and maintaining temporary utilities to support construction **as required by the Contractor's means and methods**, and remove at completion of work. This specification does not require that such facilities be provided; however, any facilities installed shall meet the minimum requirements specified herein.

1. Electric and Lighting
2. Heating and Ventilation
3. Water

B. Furnishing, installing, and maintaining sanitary facilities to support construction.

1.03 TEMPORARY ELECTRICITY AND LIGHTING

A. Arrange with utility company to provide all power for heating, lighting, operation of equipment, or for any other required use.

1. Pay costs for service and for power used.

B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available throughout construction by use of construction-type power cords.

C. Provide artificial lighting for areas of work when natural light is not adequate for work, and for areas accessible to public.

D. Furnish all extension cords, sockets, lamps, motors and accessories for work. Ground all outlets.

E. All temporary wiring, service equipment and accessories thereto installed shall be removed at expense of Contractor after serving its purpose.

1.04 TEMPORARY HEATING AND VENTILATION

A. Provide temporary heating when temperature falls below 50 deg. F and as otherwise required to:

1. Maintain working conditions acceptable to Engineer.
2. Protect all work, materials, and equipment against damage from dampness or cold.
3. Dry out structures.
4. Maintain proper conditions for installation and curing of materials.

B. Heating equipment and fuels shall be compatible for their particular purpose and shall include safety devices in accordance with industry standards.

C. Do not use combustion type heaters without proper venting nor in areas where such equipment might introduce a hazard.

D. Ensure that all enclosed areas are ventilated (using forced-draft equipment when necessary) as required to maintain proper conditions for personnel and work, and to avoid any accumulation of hazardous dust or fumes.

E. Pay costs associated with furnishing, installing, maintaining, operating, and removing of heating and ventilation equipment.

1.05 TEMPORARY WATER

A. Furnish all water required for and in connection with work to be done under this Contract.

B. Water shall not be pumped directly from the Wood River or Wyoming Upper Reservoir Impoundment without the express written consent of the State of Rhode Island Department of Environmental Management.

C. Pay costs associated with furnishing, installing, maintaining, operating, and removing of water-related equipment.

1.06 TEMPORARY SANITARY FACILITIES

A. Furnish temporary sanitary facilities at site for needs of all construction workers and others performing work or furnishing services on project.

B. Ensure that sanitary facilities are:

1. Of a capacity acceptable to Engineer.
2. Maintained throughout construction period.
3. Obscured from public view to greatest extent possible and secured to prevent vandalism.

C. Furnish at least one toilet for each 10 workers if toilets of chemically treated type are used.

D. Service, clean, and maintain facilities and enclosures.

E. Enforce use of such sanitary facilities by all personnel at site.

F. Pay costs associated with furnishing, installing, maintaining, operating and removing sanitary facilities.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01560
TEMPORARY CONTROLS

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Provisions of contract, and Division 1 Specification Sections, apply to work of this section.

1.02 REQUIREMENTS INCLUDED

A. Controlling and protecting the Contractor's operations and work.

B. Furnishing, installing and operating temporary controls during construction for:

1. Dewatering
2. Noise
3. Dust
4. Surface Water
5. Pollution
6. Debris and Clean Up
7. Air Pollution
8. Public Safety

C. Coordinate with the Owner the placement of signs within the work area and on construction fencing notifying the public that the work area is closed during construction.

1.03 WATER DISTRIBUTION SYSTEM

A. Water shall not be pumped directly from the Wood River without the express written consent of the State of Rhode Island Department of Environmental Management.

B. Any permits or fees associated with the use of public water are to be completed and paid for by the Contractor at no additional cost to the Owner. Coordination and negotiation of fees are to be completed by the Contractor at no additional cost to the Owner

1.04 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property owner. Furnish Owner copies of all agreements the Contractor has with property owners to enter or occupy private lands.

1.05 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall install temporary security fencing to prevent public access to the work area.

B. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before

the damage was done, or he shall make good the damage in other manner acceptable to the Engineer.

C. Along the location of this work, all fences, walks, bushes, trees, shrubbery and other physical features shall be protected and restored in a thoroughly workmanlike manner. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be regraded and seeded as necessary, subject to the approval of the Engineer.

D. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are likely to be damaged because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting and painting according to approved methods, using only approved tools and materials, subject to the approval of the Owner.

E. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the proposal.

1.06 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, electric and telephone cables, and cesspools adjacent to trench excavations, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by the Contractor at their expense, to the damaged items original condition.

B. The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water, gas, electric and telephone services, drain lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.

C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the contract and all costs in connection therewith shall be included in the unit prices established in the proposal.

D. Contractor shall note and protect buried utilities and pipes with the limits of work and anticipated staging areas.

1.07 PROTECTION OF WORK

A. The Contractor shall at all times protect excavations, trenches, new construction, old construction, all job materials, apparatus and fixtures from rain, wind, snow, ice, dust, dirt, mud, groundwater, back-up or leakage of sewers, drains, or other piping, and from water of any other origin, and shall remove promptly any accumulation of the above. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end at no additional cost to Owner.

B. Thoroughly protect all completed work and all stored materials.

C. Provide boards, cloths, planks, waterproof paper, canvas or other approved protection and use as necessary to prevent any damage.

D. Provide protective measures to prevent damage to lawns, trees and shrubs to remain after project is complete.

E. Protect, at end of each day's work, such work that may be liable to damage by the elements.

F. Replace or rectify work or materials damaged by workmen, by the elements or by any other cause, to the satisfaction of the Engineer and at no additional expense to the Owner.

G. Repair streets, curbs, sidewalks, poles, grass, shrubs, trees, or other existing site features, if disturbed by construction operations, in a manner satisfactory to the Owner/Engineer at no additional cost to the Owner. Structures disturbed as part of construction activity shall be restored, at a minimum, to their preconstruction condition.

H. Do not allow workmen, including those of any Subcontractor or supplier, to mark finish surfaces with marking pens or other such devices which are not readily erasable.

I. Contractor shall be responsible for any and all damage to the Owner provided materials once delivered to the site. All materials shall be handled, stored, and installed in accordance with the manufacturers recommendations.

1.08 SECURITY

A. The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner or Contractor, whether or not forming part of the work, located within the limits of work. The Contractor shall have full responsibility for the security of such property located in such areas and shall reimburse the Owner for any such loss, damage, or injury, except such as may be directly caused by agents or employees of the Owner.

PART 2.00 – MATERIALS

Not Used

PART 3.00 - EXECUTION

3.01 INTERFERENCE WITH EXISTING STRUCTURES

A. Whenever it may be necessary to cross or interfere with existing culverts, drains, water pipes, water fixtures, guardrails, fences, sewers, or other structures needing special care, due notice shall be given to the Owner and to the various public and private agencies or individuals responsible for the utility or structure that is interfered with. Whenever required, all objects shall be strengthened to meet any additional stress that the work herein specified may impose upon it, and any damage caused shall be thoroughly repaired. The entire work shall be the responsibility of the Contractor and the work shall be performed at no additional expense to the Owner. All damaged items of work or items required to be removed and replaced due to construction shall be

replaced or repaired by the Contractor to the complete satisfaction of the property Owners and/or the Engineer at no additional expense to the Owner.

3.02 REMOVAL OF WATER AND PROTECTION FROM FLOODING

A. The Contractor shall construct and maintain, at no additional expense to the Owner, all pumps, drains, well points or any other facility for the control and collection of groundwater and/or surface water and provide all pumps and piping for the removal of water from the trenches and excavations so that all trenches and excavations may be kept at all times free from water and so that all construction work may be performed in the dry.

B. Any damage resulting from the failure of the dewatering operations of the Contractor and any damage resulting from the failure of the Contractor to maintain the areas of all work in a suitable dry condition shall be repaired by the Contractor as directed by the Engineer or Owner at no additional expense to the Owner.

C. The Contractor's pumping and dewatering operations shall be carried out in accordance with RIDEM regulations and in such a manner as to prevent damage to existing structures, utilities, and the contract work; and so that no loss of ground will result from these operations.

D. Precautions shall be taken to protect new and existing work from flooding during storms or from other causes. Pumping shall be continuous where directed by the Engineer to protect the work and/or to maintain satisfactory progress.

E. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

F. Water from the trenches, excavations and drainage operations shall be pumped to a dewatering basin in such a manner as will neither cause public nuisance, nor cause injury to public health nor to public or private property nor to the work completed nor to the work in progress.

G. No extra payment will be made for the removal of water, protection from flooding, drainage work, diversion of existing water courses and such other work. Compensation therefore shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the bid.

H. The Contractor shall have in place a Construction Flood Contingency Plan to accommodate flows associated with the 10-year storm event.

1. During the course of the proposed Phase II work, the cofferdam will be allowed to overtop to accommodate storm events larger than the 10-year storm event.
2. The work area shall be stabilized to prevent the erosion of soils within the work area
3. The cofferdam shall be stabilized to prevent a failure of the cofferdam and prevent the uncontrolled release of impounded water.

I. Beyond the 10-year storm event and up to the 100-year storm event, the Construction Flood Contingency Plan shall address flows associated with the 100-year storm event without compromising the dam.

3.03 NOISE CONTROL

A. The Contractor shall employ all reasonable measures to avoid unnecessary noise and ensure that noise is appropriate for normal ambient sound levels in the work area during working hours. Where required by agencies having jurisdiction, certain noise - producing work may have to be

performed during specified periods only. Noise control measures during normal work hours shall include but not be limited to:

1. Operate machinery in a manner to cause least noise consistent with efficient performance of work.
2. Equip all construction machinery and vehicles with sound-muffling devices.
3. During construction adjacent to occupied buildings, erect screens or barriers to reduce noise in building to limits in accordance with applicable codes. Conduct operations in such a manner as to avoid unnecessary noise which might interfere with activities of building occupants.

C. When the Contractor's work extends beyond normal working hours the Contractor shall incorporate to the complete satisfaction of the Owner and Engineer, adequate noise prevention measures to insure minimum noise impact on the surrounding areas. Noise prevention measures shall include, but not be limited to:

1. Insulated enclosures.
2. Hospital grade silencers or mufflers.
3. Equipment modification.
4. Special equipment, as necessary to meet City noise guidelines.
5. Any other noise prevention measures.

D. Should at any time the Owner and/or Engineer determine that noise prevention measures are inadequate, the Contractor shall suspend all such work in question until acceptable measures are incorporated. Suspension of work due to inadequate noise prevention shall not be a cause for additional cost to the Owner.

E. Prior to the start of any work outside normal work hours, the Contractor shall submit a Noise Control plan to the Owner and Engineer for review. Noise Control plans shall be submitted for:

1. Night work.
2. All Pumping operations and work which extend beyond normal work day.
3. Any other work as determined by the Engineer which warrants special noise prevention measures.

E. All costs associated with noise control measures shall be considered part of the bid price for appropriate work being completed.

3.04 DUST CONTROL

A. At no additional cost to the Owner take measures to prevent unnecessary dust.

1. Keep earth surfaces subject to dusting moist with water only.
2. Cover dusty materials in piles or in transit to prevent blowing.

B. Protect buildings or operating facilities which may be affected adversely by dust.

C. Protect existing or new machinery, motors, instrument panels, or similar equipment with dust screens.

1. Include proper ventilation with dust screens.

3.05 SURFACE WATER CONTROL

A. Provide for drainage of storm water and such water as may be applied or discharged on site in performance of work.

B. Ensure that drainage facilities are adequate to prevent damage to work, site, and adjacent property.

1. Clean, enlarge, or supplement existing drainage channels to carry all increased runoff attributable to operation.
2. Construct dikes to:
   a. Divert increased runoff from entering adjacent property (except in natural channels).
   b. Protect the work.
   c. Direct water to drainage channels or conduits.

3.06 POLLUTION CONTROL

A. Prevent pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities.

1. In order to protect the Wood River and surrounding wetlands from hazardous materials releases by the construction equipment involved in this project, fueling shall take place within staged fueling areas in the presence of a spill kit, equipment must be in good condition and inspected for leaks; spill control and cleanup equipment shall be stored on site; and the Contractor shall be responsible for all cleanup and remediation of hazardous materials releases.
2. Do not allow sanitary wastes to enter any drain or watercourse other than sanitary sewers.
3. Do not allow sediment, debris, or other substance to enter sanitary sewers and take measures to prevent such materials from entering any drain or watercourse.
4. All concrete repair work requiring cleaning and removal of debris is to be contained so as not to contaminate the surrounding environment.

3.07 DEBRIS AND CLEANUP

A. Keep all premises free at all times from accumulation of waste materials and rubbish.

1. Immediately after unpacking, remove and dispose of all packing materials, case lumber, excelsior, wrapping, or other rubbish from site.

B. Provide trash receptacles about site, and empty containers daily.

C. Neatly stack construction materials, such as concrete forms and scaffolding, when not in use.

D. Promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solution from surfaces to prevent marring or other damage to satisfaction of Engineer and/or Owner.

E. Ensure that wastes are not buried or burned on site or disposed into storm drains, sanitary sewers, steams, or waterways.

1. Remove all wastes from site and dispose in a manner complying with local ordinances and antipollution laws.
2. Store volatile wastes in covered metal containers and remove daily.

F. Cleanup as determined by Engineer will be a condition for recommendation of progress payment application.

1. Contractor shall have full responsibility for cleaning up during and immediately upon completion of work. Remove all rubbish, waste, tools, equipment, and appurtenances caused by and used in execution of work, leaving site clean, free of debris and in condition acceptable to Owner.
2. Equipment or material shall not be left within any work area after acceptance of Contract without written permission of Owner. Do not abandon any material at or near site regardless of its value.

3.08 PUBLIC SAFETY

A. Prior to the start of the Work, Owner will post signage indicating to the public that the Wyoming Dam Fishing Access area will be closed for construction for the duration of the project.

B. At all times until final acceptance of Work by Owner, the Contractor shall protect Work and shall take all precautions of preventing injuries to persons or damage to property on or about site.

C. Contractor shall comply with all applicable laws, ordinances, rules, and regulations regarding safety of persons or property or with regard to protecting them from damage, injury, or loss and shall not load or permit any part of work to be placed so as to endanger safety of work.

D. If Contractor constructs temporary bridges or provides temporary crossing of streams, Contractor's responsibility for accidents shall include roadway and sidewalk approaches as well as structure of such crossings.

E. Conduct work such that abutters shall have reasonable access to their property. Contractor shall be responsible for providing such reasonable safe means of access to public way as Engineer deems essential. When it is necessary to leave materials and equipment upon highway or city or town way, place them so as to cause least possible obstruction to drainage, pedestrian, and other travel.

3.09 REMOVAL OF TEMPORARY CONTROLS

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Upon completion of work of all trades and before final acceptance of entire project, each trade shall remove, at it's own expense, all wiring, appurtenances and accessories used in performance of its respective work

C. Temporary sheds, utilities, barricades, signs, and other appurtenances related to prosecution of the work and not incorporated in the permanent construction shall be completely removed from the site prior to acceptance of work by Owner.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1.00 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Material and Equipment Incorporated into the Work:

1. Conform to applicable specifications and standards.
2. Comply with size, make, type and quality specified, or as specifically reviewed by the Engineer.

B. Manufactured and Fabricated Products:

1. Design, fabricate and assemble in accordance with the best engineering and shop practices.
2. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
3. Two or more items of the same kind shall be identical, by the same manufacturer.
4. Products shall be suitable for service conditions.

C. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically reviewed by Engineer.

D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 MANUFACTURER'S INSTRUCTIONS

A. When the Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, as specified in Section 01340, SUBMITTALS.

B. Maintain one set of complete instructions at the job site during installation and until completion.

C. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.

D. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.

E. Do not proceed with work without clear instructions.

F. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the Contract Documents.

1.03 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site and also when two or more trades, Contractors, or suppliers are involved.

B. Transport all materials and equipment on legally approved conveyances as required or recommended by the respective manufacturer or supplier.

C. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

D. Receive and handle all materials and equipment, at the project site, by conveyances or methods as recommended by the respective manufacturer or supplier to prevent damage to products.

E. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and reviewed submittals, and that products are properly protected and undamaged.

F. Remove from the site any material or item of equipment damaged during the transportation or handling process, and immediately replace at no additional cost to the Owner.

1.04 STORAGE AND PROTECTION

A. Store products in accordance with the manufacturer's instructions, with seals and labels intact and legible.

B. Store products subject to damage by the elements in weather tight enclosures.

C. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

D. Maintain all storage areas in a clean and orderly condition at all times.

1.05 EXTERIOR STORAGE

A. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products, which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

B. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

D. Replace any material or item of equipment damaged, due to inadequate storage protection, and immediately replace at no additional cost to the Owner.

1.06 PROTECTION AFTER INSTALLATION

A. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07 CERTIFICATES OF CONFORMANCE AND MANUFACTURE

A. In addition to other requirements specified herein, the Contractor shall furnish to the Engineer, as specified in Section 01340, SUBMITTALS, notarized certificates of conformance and manufacture that all materials and/or equipment to be furnished under this contract meet the specification requirements. When directed, each shipment of material shall be accompanied by the manufacturer's notarized certificates of conformance and manufacture. Unless otherwise specifically specified, all testing of materials shall be provided by the Contractor at no additional expense to the Owner.

B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer will be the material incorporated in the work.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1.00 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedure in closing out the work.

1.02 SUBSTANTIAL COMPLETION

A. When Contractor considers the work is substantially complete, he shall submit to Owner.

1. A written notice that the work, or designated portion thereof, is substantially complete.
2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, Owner will review the work to determine the status of completion.

C. Should Owner determine that the work is not substantially complete:

1. Owner will promptly notify the Contractor in writing, giving the reasons therefore.
2. Contractor shall remedy the deficiencies in the work, and send out another written notice of substantial completion to the Owner.
3. Owner will again review the work.

D. When Owner concurs that the work is substantially complete, he will:

1. Prepare a certificate of substantial completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Owner.
2. Submit the certificate to Contractor and manufacturer for their written acceptance of the responsibilities assigned to them in the certificate.

1.03 FINAL REVIEW

A. When Contractor considers the work is complete, he shall submit written certification that:

1. Contract documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for final review.

B. Owner will make final review to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should Owner consider that the work is incomplete or defective:

1. Owner will promptly notify the Contractor in writing, listing the incomplete or defective work.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send out another written certification to Owner that the Work is complete.
3. Owner will again review the Work.

D. When the Owner finds that the Work is acceptable under the Contract Documents and that all punch list items have been accomplished to his satisfaction, he shall request the Contractor to make closeout submittals.

1.04 FEES FOR ADDITIONAL REVIEWS

A. Should Owner or Owner's Representative perform additional reviews due to failure of the Work to comply with the claims of status of completion made by the Contractor:

1. Owner or Owner's Representative will be compensated for such additional services.
2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER

A. Operating and Maintenance Data:

1. Instruct the Owner's personnel with regard to equipment, systems and operating specialties which are installed as part of this project.
2. Submit brochures indicating operating instructions and maintenance schedules for all equipment, systems, operating devices and specialties, as specified in Section 01340, SUBMITTALS.
3. Submit detailed maintenance methods and schedules for all materials and equipment provided in this project, as specified in Section 01340, SUBMITTALS.

B. Warranties, Guarantees, and Bonds:

1. In addition to the Warranty and Guarantee Requirements of the General Conditions, provide all other guarantees, bonds, affidavits and certifications required throughout the specifications.

C. Spare parts and maintenance materials for Owner.

D. Contractor's affidavit of payment of debts and claims.

E. Contractor's affidavit of release of liens.

F. Consent of surety to final payment.

G. Certificate of insurance for products and completed operations.

H. Project Record Drawings – (see Section 01720)

1. Inclusive of red-lined markups and surveyed as-builts of final grades and site features.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to Owner.

B. Statement shall reflect all adjustments to the contract sum:

1. The original contract sum.
2. Additions and deductions resulting from:
   a. Previous change orders.
   b. Allowances.
   c. Unit prices.
   d. Deductions for uncorrected work.
   e. Deductions for liquidated damages.
   f. Deductions for re-inspection payments.
   g. Other adjustments.
3. Total contract sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C. Owner will prepare a final change order reflecting approved adjustments to the contract sum which were not previously made by change orders.

1.07 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the final application for payment in accordance with procedures and requirements stated in the General Conditions.

PART 2.00 - PRODUCTS

Not Used

PART 3.00 - EXECUTION

Not Used

END OF SECTION

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1.00 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Maintain at the site for the Owner one record copy of

1. Drawings
2. Specifications
3. Addenda
4. Change orders and other modifications to the contract
5. Engineer field orders or written instructions
6. Reviewed shop drawings, product data and samples
7. Field test records

B. The Contractor will be required to furnish, at no additional expense to the Owner, the services of a surveyor and/or Engineer registered in the state where the project is located and under whose direction shall be obtained and recorded all surveys, measurements and such other data required for the determination of the as-built records of the construction of all site work.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.

B. Provide locked file cabinet for storage of documents.

C. Provide locked cabinet space for storage of samples.

D. File documents and samples in accordance with CSI/CSC format.

E. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

F. Make documents and samples available at all times for inspection by Engineer and Owner.

1.03 MARKING DEVICES

A. Provide felt tip marking pens for recording information in the color code designated by Engineer.

1.04 RECORDING

A. Label each document "Project Record" in neat large printed letters.

B. Record information concurrently with construction progress.

C. Do not conceal any work until required information is recorded.

D. Drawings: Principal dimensions, elevations and other data, as required, shall be recorded for all work, such as:

1. Deviations of any nature made during construction.

2. Location of underground utilities.
3. Field changes of dimension and detail.
4. Changes made by field order or by change order.
5. Details not on original contract drawings.

E. The marked-up prints shall be inspected weekly by the Engineer and shall be corrected immediately if found either inaccurate or incomplete.

F. Specifications and Addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
2. Changes made by field order or by change order shall reference the appropriate order on the drawings.

1.05 FINAL MEASUREMENTS

A. The Contractor shall provide qualified personnel and equipment for taking final measurements for quantities and record documents.

B. During and/or at the completion of the project the Contractor shall complete as-built surveys to accurately and precisely document the completed work within the project LOD.
1. Elevations of inverts of structures, gates, catwalks, walls, inverts, pipes, and instrumentation shall be measured to within 0.01 foot.
2. Ground surfaces shall be surveyed to create an provide a grade map with 1 foot contours with intermittent spot grades.

1.06 RECORD DRAWINGS

A. At the completion of the project, and prior to submitting for final payment, the record prints shall be submitted to the Engineer for final review and comment.

B. The Contractor shall correct, amplify and do all other work as may be required by the Engineer to complete the drawings in a manner satisfactory to the Engineer and at no additional cost to the Owner.

C. Upon approval, the Contractor shall provide two (2) full size copies of the final record drawing set and one (1) in PDF or electronic format to the Engineer. The final record set shall be submitted to the Owner by the Engineer.

1.07 SUBMITTAL

A. Close out submittal shall consist of the following:

3. A cover sheet indicating:
   a. Project Title
   b. Owner's name and address
   c. Contractor's name and address
   d. Date of substantial completion
   e. Date of final completion
   f. Contents of submittal package

4. Final project submittals (submittals marked “rejected” or “revise and resubmit” need not be included)
5. Project RFI’s
6. Project record documents (redlined drawings)

B. At contract close-out, deliver record documents to Engineer for the Owner.

C. Accompany submittal with transmittal letter in duplicate, containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each record document
5. Signature of Contractor or his authorized representative

PART 2.00 – PRODUCTS
Not Used

PART 3.00 – EXECUTION
Not Used

END OF SECTION

DIVISION 2 – SITE WORK

SECTION 02050
DEMOLITION AND REMOVAL

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. This section covers the work associated with but not limited to:
   1. The removal and offsite disposal of trees, stumps, and vegetation marked for removal.
   2. The removal and offsite disposal of the existing low-level outlet gate and frame components.
   3. The removal and offsite disposal of the existing sluiceway gate/stop logs, frame components, and foot bridge spanning the sluiceway.
   4. The removal and offsite upland disposal of unsuitable dredge spoils.
   5. The removal and offsite disposal of unsuitable excavation spoils
   6. The removal and offsite disposal of the concrete apron and cap log atop the primary spillway.
   7. The removal and offsite disposal of miscellaneous loose concrete/masonry and stone removed during repointing and to facilitate the permeation grouting program.
   8. The removal and offsite disposal of all unsuitable material encountered during excavation operations.
   9. The removal and stockpiling of all suitable materials encountered during excavation operations.

The work shall be executed to the lines and grades shown on the Contract Documents and described in the specifications.

1.02 SUBMITTALS

A. The Contractor shall submit to the Owner and Engineer a schedule of removal and disposal.

B. Contractor shall submit disposal site certification and haul roads for all disposal.

PART 2.00 - PRODUCTS

2.01 GENERAL

A. The Contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the Work shown and specified

PART 3.00 - EXECUTION

3.01 GENERAL

A. No demolition or removal shall occur until proper controls, diversions, cofferdams, etc have been accepted and installed.

B. Demolition approaches shall employ low vibration methodologies that limits disturbance to adjacent structure(s) to remain. Vibrations are not to exceed 2 in/sec.

C. No blasting will be permitted.

3.02 EXISTING TREES, STUMPS, AND VEGETATION

A. See Section 02110.

3.03 LOW LEVEL OUTLET GATE AND FRAME COMPONENTS

A. Remove and dispose of the existing low-level outlet gate and frame components as needed to abandon the low-level outlet without concrete leakage around the existing outlet frame and gate

B. Sections of the stone masonry walls or culvert damaged by the Contractor that is not scheduled for abandonment or removal shall be replaced by the Contractor at no additional cost. This includes excavation and dewatering required to remove or replace damaged sections.

3.04 SLUICEWAY GATE/STOP LOGS, FRAME COMPONENTS AND FOOT BRIDGE

A. Remove and dispose of the existing sluiceway gate/stop logs, frame components, and foot bridge spanning the sluiceway.

C. Sections of the stone masonry walls or sluiceway damaged by the Contractor that is not scheduled for removal shall be replaced by the Contractor at no additional cost. This includes excavation and dewatering required to remove or replace damaged sections.

3.05 REINFORCED CONCRETE, UNREINFORCED CONCRETE, AND CONCRETE ENCASED TIMBER

D. Remove and dispose of concrete, reinforcement, and timber encased in concrete as a part of the removal and disposal of the concrete apron and cap log.

E. Sections of the spillway damaged by the Contractor that is not scheduled for removal shall be replaced by the Contractor at no additional cost. This includes excavation and dewatering required to remove or replace damaged sections.

3.06 CONCRETE, MASONRY, AND STONE DEBRIS

A. Remove and dispose of the miscellaneous loose concrete and masonry debris removed during repointing.

B. Remove and dispose of miscellaneous loose concrete and stone removed to facilitate the permeation grouting program.

C. Stone removed should be stockpiled for reuse elsewhere on-site prior to be removed from the site.

3.07 REMOVE AND STOCKPILE LOAM BORROW

A. Remove and stockpile loam borrow for later reuse.

B. Material stockpiled for reuse is subject to testing in accordance with Section 01400.

3.08 REMOVE AND UPLAND DISPOSAL OF UNSUITABLE DREDGE SPOILS

A. Remove and dispose of off-site excavation materials associated with the low-level outlet approach, the primary spillway engineered fill approach, and other excavated material encountered as part of the work.

B. A sedimentation sampling report of proposed excavation materials has been attached in Appendix C. Note that during the investigation phase of this work several samples returned results indicating

concentrations of contaminants exceeding State criteria for upland disposal.

C. Material excavated from each phase of work shall be stockpiled separately and tested in accordance with QA/QC frequency or as required by the Contractor's chosen disposal facility.

D. Excavation spoils shall be disposed of in accordance with all Local, State, and Federal Laws.

3.09 REMOVE AND DISPOSAL OF UNSUITABLE EXCAVATION SPOILS

A. Remove and dispose of off-site excavation materials associated with the excavation of the dam embankment, and other excavated material encountered as part of the work.

B. A sedimentation sampling report of proposed excavation materials has been attached in Appendix C.

C. Excavation spoils shall be disposed of in accordance with all Local, State, and Federal Laws.

3.10 REMOVE AND DISPOSE UNSUITABLE ON-SITE MATERIALS

A. Remove and dispose of off-site, on-site earthen fill, loam, and stone materials deemed unacceptable for reuse.

3.11 REMOVE AND STOCKPILE ON-SITE MATERIALS

A. Remove and stockpile on-site earthen fill from the right embankment for later reuse.

B. Materials shall be segregated by material type so as to not be mixed or require further segregation.

C. The suitability of the existing material for later reuse shall be determined by the Engineer or Owner. No material shall be disposed of offsite without the approval of the Engineer or Owner. Suitable stone shall be used for the proposed riprap systems or any other use as determined by the Engineer or Owner. Suitable soil material shall be used for backfilling or regrading operations or any other use as determined by the Engineer or Owner. All suitable soil material that is temporarily stockpiled on-site shall be protected from adverse weather conditions until the time of installation.

3.12 REMOVE AND DISPOSE UNUSED AND WASTED GROUT MATERIAL

A. Remove and dispose of off-site spent, unused, and wasted grout materials associated with the center embankment grouting program.

B. Grout that becomes hardened in topsoils shall be removed and replacement topsoil shall be imported, placed, and seeded. This work is considered incidental to the appropriate grouting bid item.

3.13 DISPOSAL

A. No burning of combustible materials will be permitted. Remove all demolition materials from the work site and dispose of in accordance with all Federal, State, and local codes, regulations, and ordinances.

3.14 PROTECTION OF EXISTING UTILITIES

A. Protect existing site improvements from damage during construction.

B. Restore damaged improvements to their original condition, as acceptable to the Engineer.

C. All areas disturbed through the removal and disposal of existing utilities and site improvements outside the limits of final grading shall be loamed and seeded or paved to match or exceed existing conditions.

D. The Contractor shall protect existing utility poles, guy wires, overhead wires, and other electrical or communications elements within and adjacent to the property that may be affected by construction activities.

E. Any damage to these utilities or structures resulting from the construction operation shall be repaired to meet or exceed the existing condition at the Contractor's expense.

F. Any losses to the property or any other utility company resulting from the interruption of service from construction, both directly or indirectly, shall be the responsibility of the Contractor, and shall result in no additional cost to the Owner.

G. The Contractor shall make every effort to protect existing utilities including electrical and communications conduits and structures during construction. Any damage to utilities designated to remain shall be repaired immediately at the Contractor's expense.

END OF SECTION

SECTION 02110
CLEARING, GRUBBING, AND STRIPPING

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary to clear and grub the work area and other areas as specified including areas of woody and brush growth within riprap areas; to the limits indicated on the drawings; and the work necessary strip the topsoil and/or organic material from all areas to be filled or graded as shown on the Drawings, , or otherwise designated in the Specifications.

B. This work shall also include the preservation from injury or defacement of all vegetation, and existing objects designated to remain, as shown, specified herein, or beyond the limits of work indicated.

C. The Contractor shall stake the limits of clearing, grubbing, and stripping. The Engineer shall review the location, limits, and methods to be used prior to commencing the work under this section.

PART 2.00 - PRODUCTS

2.01 GENERAL

A. The Contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the work shown, specified herein, and as required to complete the project.

B. It is brought to the Contractor's attention that procedures for drainage, erosion and siltation control specified will be controlled by a RIPDES General Permit for Stormwater Discharge associated with Construction Activity (RIPDES). The Contractor is responsible for filing the RIPDES. Contractor is required to prepare all necessary documents required for the RIPDES Permit.

C. The Contractor shall be aware a Dam Safety Permit under Rule 10 has been filed in compliance with the Department of Environmental Management wetland protection rules and regulations. The conditions of said permit are considered part of the Project Specifications.

D. Applying for and/or updating and obtaining a RIPDES General Permit for Stormwater Discharge associated with Construction Activity prior to any construction work at the site is the Contractor's responsibility.

PART 3.00 - EXECUTION

3.01 CLEARING

A. Definition: Clearing shall consist of cutting, removing, and disposing of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth, and shall be performed in such a manner as to remove all evidence of their presence from the surface and shall be inclusive of sticks and branches greater than 0.5 inches in diameter or thickness. Clearing shall also include the removal and disposal of trash piles, rubbish, and fencing; and the preservation of trees, shrubs, and vegetative growth, which are designated to remain.

B. Cutting Timber: In the cutting of timber growth, cuts shall be made such that all trees are felled into the area to be cleared. Exercise care when clearing near the clearing limits so as not to damage existing trees, vegetation, structures, or utilities which are outside of the clearing limits. Flush cut all stumps not designated for grubbing by cutting to within 3 inches of the ground surface.

3.02 PRESERVATION OF TREES, SHRUBS, AND OTHER VEGETATION

A. Protect trees, shrubbery, and other vegetation not designated for removal from damage resulting from the Work. Cut and remove tree branches only where such cutting is necessary to allow for construction operation as approved by the Engineer and/or Owner. Remove branches other than those required to complete the Work to provide a balanced appearance of any tree, as approved prior to removal. All pruning performed shall be in accordance with the latest version of the International Society of Arboriculture standards.

3.03 GRUBBING

A. Definition: Grubbing shall consist of the removal and disposal of wood or root matter below the ground surface remaining after clearing and shall include stumps, trunks, roots, or root systems greater than 1/2 inch in diameter or thickness.

B. Areas requiring clearing and grubbing are shown on the Drawings and specified herein.

3.04 CLEARING AND GRUBBING WITHIN STONE MASONRY WALLS

A. Contractor shall exercise care when removing vegetation from the face or in close proximity to stone masonry walls as root systems from the vegetation can become wedged within the joints of the stone masonry.

B. Vegetation shall be removed in such a way to prevent the shifting of stone masonry units.

C. When root systems in the face of the wall are too large to remove completely without shifting stones, the Contractor shall remove the root system as far as possible and then provide chinking stone and mortar to cover the root system and seal the stone masonry joint.

D. When root systems enter the stone masonry wall from the back face, roots shall be cut flush with the back face of the wall.

3.05 CLEARING AND GRUBBING FOR TRENCHING

A. Complete clearing and grubbing prior to the start of trenching. Get Engineer's approval before beginning trenching. Do not permit excavated trench materials to cover brush or trees prior to their removal and disposal.

3.06 DISPOSAL OF CLEARING AND GRUBBING DEBRIS

A. Material shall be promptly removed from the site and disposed of in accordance with all local laws, codes, and ordinances. The Contractor shall bear full responsibility for lawful and safe disposal of all cleared and grubbed material.

3.07 STRIPPING

A. Definition: Stripping shall include the removal of all organic sod, loam borrow, grass and grass roots, remaining after clearing and grubbing.

B. Disposal of Stripping: Loam borrow from stripping operations which meets the requirements specified in

Section 02200, EARTHWORK and Section 02900 LANDSCAPING, shall be stockpiled and protected for later use. All other material will be disposed of offsite at the Contractor's expense.

C. Stockpiled loam shall be approved by the Engineer and/or Owner prior to reuse, including an agreed upon quantity for reuse.

END OF SECTION

SECTION 02200
EARTHWORK

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary for:

1. Excavation to subgrade, preparation of the subgrade, and backfilling for embankment improvements.
2. Excavation to subgrade, preparation of the subgrade, and backfilling for spillway cutoff improvements.
3. Excavation to subgrade, preparation of the subgrade, and backfilling for low-level outlet improvements.
4. Compaction requirements for backfilling.
5. Material requirements for soils and geotextiles.
6. All ancillary activities requiring excavation and backfilling.

B. All Earth excavation is unclassified and shall include the excavation, removal and satisfactory disposal or reuse of all materials of whatever nature encountered from within the limits indicated or specified (other than rock ledge) or as directed in writing. It shall include, but not be limited to, earth materials such as peats, organic or inorganic silts, clay, sand and gravel, cobbles and boulders less than 3 cubic yards in volume, soft or disintegrated rock which, in the opinion of the Engineer, can be removed without blasting or drilling, pavement, and all obstructions not specifically included in another section.

1.02 DEFINITIONS

A. Boulder: A stone particle with a minimum dimension of 36 inches.

B. Completed Course: A course or layer that is ready for the next layer or next phase of the work.

C. Excavation: Removal of material encountered above elevations and to lines and dimensions indicated on the drawings.

1. Additional Excavation: Excavation below subgrade elevations or beyond the indicated lines and dimensions as directed by the Engineer or Owner.
2. Bulk Excavation: Excavation more than 6 feet in width and more than 10 feet in length.
3. Trench Excavation: Excavation 6 feet in width or less for the installation of utilities and footings.
4. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.
5. Unclassified Excavation: The nature of materials to be encountered has not been identified or described herein.

D. Fill: Soil materials used to raise existing grades.

E. Frost Zone: The area within 4 feet of finished grade.

F. Influence Area: The area within planes sloped downward and outward at an angle of 60 degrees from the horizontal from (a) 1 foot outside the outermost edge at the base of foundations or slabs; or (b) 1 foot outside the outermost edge at the surface of roadways or shoulder: or (c) 0.5 foot outside the exterior edge at the spring line of pipes and culverts.

G. Imported Material: Material obtained by the Contractor from sources off the site.

H. "In-the-dry": In-situ soil moisture content of no more than two percentage points above the optimum moisture content for that soil.

I. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

J. Prepared Ground Surface: The ground surface after clearing, grubbing, stripping, excavation, and scarification and/or compaction.

K. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557 (i.e. the Modified Proctor Test). Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Engineer.

L. Relative Density: As defined by ASTM D4253 or D4254.

M. Rock: Material in beds, ledges, unstratified masses, conglomerate deposits that cannot be removed, in the opinion of the Engineer, without systematic drilling, splitting, or ripping.

N. Soils Representative: The Geotechnical Engineer or a delegate of the Geotechnical Engineer that observes and records the construction of the subgrade, backfill, slabs, footings, utilities, pavements, and related items within the Contract Documents.

O. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

P. Subbase Course: Course placed between the subgrade and base course for asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or asphalt walk.

Q. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

R. Suitable Soil: Soil that has been approved by the Engineer for use in a designated area.

S. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered. The nature of materials to be encountered has not been identified or described herein. Unclassified excavated materials may include rock, boulders, soil materials, and obstructions.

T. Unsuitable Soils: Existing soils that, in the opinion of the Engineer and Owner's Representative, are unsuitable to remain in their existing location that are deposited outside the excavation limits such as mulch, peat, organic silt, topsoil, sod, ash, deleterious material, roots greater than ¼-inch in diameter, and/or particles greater than four inches in diameter, that are not satisfactory for use as determined by the Engineer or Owner.

1. Anticipated unsuitable soils: Unsuitable soils identified in the drawings, specifications, test pit logs, or boring logs provided.
2. Unanticipated unsuitable soils: Unsuitable soils not identified in either the geotechnical report, test pits, or boring logs provided as part of the project manual.

U. Utilities: On-site underground pipes, conduits, ducts, and cables or overhead wires, as well as underground services within buildings.

V. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

1.03 SITE INFORMATION

A. Test borings and other explorations may be made by the Contractor at no cost to the Owner. Damage to the site as a result of additional test borings shall be repaired at the Contractor's sole expense.

B. Borings have been completed as part of the evaluation and design and have been provided for the contractors reference.

C. Prior to conducting additional test borings the Contractor shall indicate that the boring logs for borings attached to these Contract Documents have been reviewed.

1.04 EXISTING UTILITIES

A. Call Dig Safe **1-888-DIG-SAFE (1-888-344-7233)** 72 hours before commencing with any excavation, in order that all pertinent utility companies become informed of such work.

B. The Contractor shall coordinate with the State of Rhode Island the clearing of private utilities prior to commencing with any excavation, exploration, or other underground work.

C. If active utilities existing on the site are encountered they shall be carefully protected from damage. When an active utility line is exposed during construction, its location and elevation shall be documented and both the Engineer and the utility Owner notified in writing.

D. Active utility lines damaged in the course of construction operations shall be repaired or replaced as determined by the Engineer, without additional cost to the Owner.

1.05 USE OF EXPLOSIVES

A. Use of explosives is prohibited.

1.06 SUBMITTALS

A. Provide the following submittals:

1. Certification, test results, source, and samples for all imported earth materials. Submit bag samples (40lbs minimum) of each type of fill material to be used for backfilling to the Engineer at least 10 working days in advance of its required use. Representative samples of excavated fill material which will be used for backfill shall also be submitted for testing.

2. Soil testing including grain size through 0.002mm, moisture density relationship, soil permeability, dry density as-placed, and moisture as-placed shall be at the rates proscribed in Section 01400 of these specifications

3. Support of excavation submittals
   i. Details identifying the design, layout, and method of construction of any required support of excavation system, stamped by a Professional Engineered licensed by the State of Rhode Island.

ii. Design calculations identifying each support of excavation system's ability to withstand all loads during all stages of the excavation and backfilling process.

iii. Documentation certifying that each excavation support system that is constructed in the field remains, throughout its use, to be in compliance with the design of that specific system.

4. Catalog and manufacturer's data sheets for compaction equipment.

5. Copies of permits obtained for excavation that are required by state and local governing authorities.

6. Manufacturer's certificate of compliance attesting that geotextiles meet the requirements of these specifications. Provide mill certificates stating the length and width of fabric contained on each roll.

1.07 IMPORTED MATERIAL ACCEPTANCE

A. All imported earth materials specified in this section are subject to the following requirements:

1. All tests necessary for the Contractor to locate acceptable sources of imported material shall be made by the Contractor. Certification that the material conforms to the Specification requirements along with copies of the test results from a qualified commercial testing laboratory shall be submitted to the Engineer for approval at least 14 calendar days before the material is required for use. All material samples shall be a minimum of 40 pounds and furnished by the Contractor at the Contractor's sole expense. Samples shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the Contractor in accordance with ASTM D75. Tentative acceptance of the material shall be based on an inspection of the source by the Engineer and/or the certified test results submitted by the Contractor to the Engineer at the Engineer's discretion. No imported materials shall be delivered to the site until the proposed source and materials tests have been tentatively accepted in writing by the Engineer. Final acceptance will be based on Quality Control and Quality Assurance tests made on samples of material taken from the completed and compacted course.

2. Gradation tests by the Contractor shall be made on samples taken at the place of production prior to shipment. Samples of the finished product for gradation testing shall be taken as specified in Section 01400, QUALITY CONTROL, or more often as directed by the Engineer if variation in gradation is occurring, or if the material appears to depart from the Specifications. Test results shall be forwarded to the Engineer within 48 hours of testing.

3. If tests conducted by the Contractor or the Engineer indicate that the material does not meet Specification requirements, material placement will be terminated until corrective measures are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense. Retesting of material that does not meet specification requirements shall be performed at the Contractor's sole expense.

1.08 SHORING, SHEETING, BRACING, AND SLOPING

A. The Contractor shall design, furnish, install, and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of excavations, maintain a stable excavation bottom, control groundwater, and to keep and to prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Furnish, install, and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations and agencies. See Section 02250 for additional information about these systems.

1.09 EXCAVATION SAFETY

A. The Contractor shall be solely responsible for making all excavations in a safe manner. Provide measures to attain a stable base, retain excavation sideslopes and prevent earth slides to ensure that persons working in or near the excavation are protected.

1.10 CODES, ORDINANCES, AND STATUS

A. The Contractor shall familiarize itself with, and comply with, all applicable codes, ordinances, statues, and bear sole responsibility for the penalties imposed for noncompliance.

1.11 TOLERANCES

A. All material limits shall be constructed within a vertical tolerance of 0.1 foot and a horizontal tolerance of 1 foot except where dimensions or grades are shown or specified as minimum. All grading shall be performed to maintain slopes and drainage as shown. No reverse slopes will be permitted.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Fill materials shall consist of hard, durable, sand and gravel and shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter.

1. Engineered Fill shall be imported or reused material conforming to Type Ib of Section M.01.09 of the RIDOT Standard Specifications for Road and Bridge Design, modified such that 50-85 percent of material passes the No. 4 sieve and 10 to 20 percent of material passes the No. 200 sieve, having the following gradation. Engineered Fill shall be utilized as specified.

Engineered Fill Material	
Sieve Size	**Percent Passing**
	Type Ib
3 inch	100
1-1/2 inch	70-100
3/4 inch	60-95
1/2 inch	-
3/8 inch	-
No. 4	50-85
No. 40	-
No. 50	10-30
No. 200	10-20

2. Gravel Borrow for use as roadway and parking lot subbase material shall be imported or reused material conforming to Type Ia or Ib of Section M.01.09 of the RIDOT Standard Specifications for Road and Bridge Design. Gravel Borrow shall be used as specified.

3. On-site materials may be used as Engineered Fill provided:
   i. They shall be excavated on-site material free of roots, sod, rubbish or other deleterious or organic matter.
   ii. A geotechnical engineer is on-site to observe the excavation and stockpiling of the material.

iii. The QA/QC rates are increased to two times as often as indicated in Section 01400.
iv. The Owner/Owner's representative reserves the right to require additional testing of on-site materials prior to determination of suitability for reuse.

B. Water for compaction shall be furnished by the Contractor. Water for compaction from sources other than potable sources shall be as approved by the Engineer.

C. Geotextiles shall be nonwoven, needle punched pervious sheets of polyester, polyethylene, nylon, or polypropylene filaments formed into a uniform pattern. The geotextiles shall have the following minimum properties when measured in accordance with the referenced standards.

Test	**Method**	**Type I**
Grab Tensile Strength (lbs)	ASTM D4632	150-200
Elongation at Required Strength (%)	ASTM D4642	50
Trapezoidal Tear Strength (lbs)	ASTM D4533	50-60
CBR Puncture Strength (lbs)	ASTM D6241	>300
UV Resistance (after 500hrs)	ASTM D4355	70%
Apparent Opening Size (US Standard Sieve)	ASTM D4751	60-80
Permittivity (sec-1)	ASTM D4491	1.7
Flow Rate (2) (gal/min/sf)	ASTM D4491	120-140

PART 3.00 EXECUTION

3.01 GENERAL

A. All Loam Borrow and unsuitable or excess materials shall be stripped from areas of new construction or regrading. Materials suitable for reuse shall be stored in approved locations that will not interfere with construction operations. Loam Borrow shall be stripped and stored before any underlying excavating is begun. Stripped Loam Borrow to be reused shall be free from clay, large stones and debris. All excess and unsuitable materials shall be legally disposed of off-site by the Contractor.

B. All excavations shall be backfilled as specified. All compacted fill shall be placed in layers. Each layer shall be systematically compacted by approved compaction equipment to the density specified herein.

C. Compaction equipment in open areas shall consist of a vibratory drum roller with a minimum static weight of 10,000 lbs.

D. Compaction equipment in confined area (in trenches and adjacent to walls) shall be accomplished by hand-operated vibratory compaction.

E. Material that is allowed to become saturated may be difficult to traverse, place, and compact. Care shall be taken to maintain the appropriate moisture content and prevent ground water, surface water, or precipitation from saturating stockpiled or placed material.

1. Elastic-type deformation (pumping or weaving) may indicate there is excess moisture in the soil

without adequate drainage time as the load is applied. Notify the Engineer of this condition.

2. The contractor, at no cost to the Owner, may decide to stay off the area until the excess pore water pressure is dissipated naturally, or the material can be scarified and dried, or removed and replaced with dryer approved material.

F. Prior to placing concrete or backfill against rock, the rock surface shall be cleared of loose rock, cleaned and washed of all loose soil, organic matter or other deleterious materials such that competent rock surface is exposed. The cleaned rock surface shall be inspected by the Engineer prior to the Contractor placing backfill or concrete against the rock. Backfill or concrete placed against the surface of rock without prior inspection by the Engineer shall be subject to removal and replacement at the discretion of the Engineer at no additional cost to the Owner.

3.02 WORK IN FREEZING WEATHER

A. Protect excavation bottoms and sides against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.

B. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

C. The Contractor shall not place a layer of fill on snow, ice, or soil that was permitted to freeze.

1. Removal of these unsatisfactory materials will be required as determined by the Owner/Engineer.

2. Fill to be incorporated into the work shall not be permitted to freeze. "Breaking up" frozen soil will not be considered suitable for making frozen soils suitable for reuse.

3.03 REMOVAL OF WATER

A. Refer to Section 02400, DEWATERING CONTROL AND DIVERSION OF WATER.

B. The existing materials found within most dam structures typically have significant fines content, which can trap groundwater within the existing soil even after a pond has been drawn down. This trapped water often leaches into an open excavation, which if not controlled, could adversely affect subgrade preparation and backfilling operations. The Contractor should anticipate and provide means for controlling this issue during all earthwork operations.

C. The groundwater table can be expected to be encountered during excavation excavation/installation of retaining wall sections, and during installation of the low-level outlet conduit. It should be noted that groundwater levels may fluctuate over time due to variations in rainfall and other factors different from those prevailing at the time the explorations were performed.

3.04 STOCKPILE OPERATION

A. Keep stockpiles and areas around them graded to drain and take all necessary precautions to minimize erosion including but not limited to the installation of baled hay. Maintain access roads as necessary at the Contractor's expense. Excavation at the stockpiles shall be limited to that depth which will permit the completed area to slope to drain to the surrounding area after completion of all work.

1. The Contractor shall be responsible for protecting stockpiles of suitable material.

2. Protect the stockpile so that the stockpiled material remains in a condition suitable for use in the project.

3. Cover or otherwise protect the stockpiles to prevent saturation of the material from precipitation and to protect the material from the development of frost.

4. Material lost through erosion or deemed unacceptable for reuse due to improper stockpiling shall be replaced by the Contractor at no additional cost to the Owner

B. Remove all stockpiles at the completion of the project. Grade the surrounding area at completion and finish the area as specified in Section 02900, LANDSCAPING.

3.05 BACKFILL

A. The Contractor shall inform the Engineer in writing a minimum of 48 hours prior to starting any backfill operation. The information shall include the location to be filled, the amount of fill to be placed, and the material to be placed.

B. Prior to placing any backfill, remove all trash, debris, and/or any other unsuitable material from areas where backfill is to be placed. Do not place frozen backfill. Do not place backfill on frozen ground or in areas where standing water is present.

C. Do not operate earth-moving or other heavy equipment within a distance that will cause damage to new or existing structures. Compact embankment fill backfill as shown within the contract drawings with hand-operated vibratory compactors or other acceptable equipment in 12-inch maximum loose lifts. Each and every lift shall be compacted to not less than 98 percent relative compaction. Compaction shall be performed in a manner, which will not damage new or existing structures and utilities.

3.06 ENGINEERED FILL

A. Place and Grade to the limits indicated on the Drawings, using imported or reused Engineered Fill. Place material in 12-inch maximum loose lifts and compact each lift to not less than 98 percent relative compaction. This material contains higher silt content than typical gravel, and may be easily disturbed after placement especially if placed at a high moisture contents. It is the contractor's responsibility, at no cost to the owner, to provide the means to maintain a stable subgrade prior to the placement of subsequent lifts or concrete.

3.07 CRUSHED STONE FOR DEWATERING SYSTEMS

B. Crushed stone used for dewatering sumps shall be removed in its entirety prior to backfilling.

C. The use of crushed stone as a substitute for other specified fills within the zone of influence of the dam embankment or spillway structure shall be strictly prohibited; substitutions elsewhere on site will be at the discretion of the Engineer.

3.08 GRAVEL BORROW

A. Place and Grade to the limits indicated on the Drawings, using imported or reused Gravel Borrow. Place material in 12-inch maximum loose lifts and compact each lift to not less than 98 percent relative compaction. It is the contractor's responsibility, at no cost to the owner, to provide the means to maintain a stable subgrade prior to the placement of subsequent lifts or pavements.

3.09 GENERAL EXCAVATION

A. All excavations shall progress under good practice and shall abide to all State and Federal regulations.

B. The contractor shall provide the means necessary to dewater excavations so as to achieve a firm and stable subgrade upon reaching the bottom of the excavation.

3.10 EXCAVATION SITE SPECIFIC

A. Excavations within the embankment and spillway shall be considered unclassified.

B. Boulders and construction debris should be expected during the course of embankment excavation.

3.11 TRENCH EXCAVATION

A. Excavation: All obstructions, such as tree roots, stumps, boulders, construction debris and other material of any type shall be removed.

B. Trench Width: Minimum width of unsheeted trenches or the minimum clear width of Sheeted trenches in which pipe is to be laid shall be 24 inches. Sheeting requirements shall be independent of trench width. The maximum clear width at the top of the pipe or above the pipe will not be limited, except in cases where excess width of excavation would cause damage to adjacent structures.

C. After completion of excavation, and prior to backfill placement, compact the excavation surface with a heavy vibratory roller or other suitable equipment to detect soft or loose zones. Notify the Engineer prior to commencement of compacting. If soft or loose zones are found excavate the soft or loose material to a depth accepted by the Engineer, then fill with Embankment Fill or Gravel Borrow as specified for such fill. The cost of such excavation shall be paid for under the appropriate unit price bid item.

D. Trench excavations shall be backfilled utilizing material specified within the Construction Drawings.

3.12 MOISTURE CONTROL

A. During the compacting operations, the moisture content of the material shall be within the range necessary to obtain the specified compaction, as determined by laboratory testing.

B. Maintain moisture content throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement, if required, by sprinkling the material.

C. Do not compact material that contains excessive moisture. Aerate material by blading, discing, harrowing, or as approved, to hasten the drying process.

D. Stockpiled soils which are left uncovered on the site may become saturated due to rainfall or other precipitation events. The Contractor shall protect stockpiled material from becoming too wet to achieve adequate compaction. Any soil which becomes too wet shall be dried or replaced by the Contractor at no additional cost to the Owner.

3.13 COMPACTION

A. Place material within the embankment in 12-inch maximum loose lifts and compact each lift to not less than 98 percent of the maximum dry density as determined by the Modified Proctor Test. Make proper allowances for Bedding for Loam Borrow, Low Permeability Fill, and Engineered Fill.

B. Material placed up gradient of the existing low-level outlet and material placed beyond the dam embankment shall be placed in 12-inch maximum lifts and compacted to not less than 95% of the maximum dry density as determined by the modified proctor test.

C. The Contractor shall make all necessary excavations and preparations for testing by the Owner. Excavations for density tests shall be backfilled with material similar to that excavated, and compacted to the specified density by the Contractor. Failure of the backfill material to achieve the specified density will be just cause for rejection of any or all portions of the excavation section tested. The Contractor will not be granted an extension of time or additional compensation for testing or repair of backfill ordered by the Engineer.

3.14 ROCK EXCAVATION

A. General

1. If rock is encountered prior to reaching the proposed elevation for footings or other structures, the Contractor shall immediately notify the Engineer and provide an estimate of the required volume for removal to reach the proposed elevation and provide an estimate of the rocks condition.

2. Rock excavation includes the removal of rock to the lines and grades shown on the plans and as specified within this Section and the disposal of the Rock off site by legal methods.

3. The use of explosives to remove rock is strictly prohibited.

4. Rock removal shall be limited to rock fracturing techniques that do not cause repeated vibration, such as drilling and splitting.

5. All rock excavation shall be included within the original Contract Sum under the associated items. No additional payment will be made for rock excavation.

6. Allowance for Rock Excavation: The Base Bid shall cover all costs relating to such rock excavation, including drilling, splitting/fracturing, removal and placement of the excavated material, overhead and profit. No amount other than that herein specified will be paid by the Owner for excavation herein defined.

7. Unit prices for bid items inclusive of rock excavation shall include all labor, equipment, and materials required for removal of rock. Bid items inclusive of rock excavation shall also include all labor, equipment, and materials required for replacement of rock excavation with approved materials where the rock excavation extends beyond the specified excavation limits. Any excavation beyond the specified excavation limits must be approved by the Engineer prior to removal.

8. Rock capable of removal through standard excavation procedures shall be removed from the excavation, measured by the Contractor, and verified by the Owner's Representative.

9. Rock that cannot be removed by standard excavation measures shall be uncovered to expose all faces of rock in the area that requires excavation. The Contractor shall notify the Owner. The dimensions and quantity of the rock in place and the rock removed from the trench shall be measured by a Licensed Land Surveyor registered in the State of Rhode Island at the Contractor's expense through pre- and post-rock removal surveys. All survey information shall be supplied to the Owner's Representative for verification of the quantity.

B. Rock Removal Limits

1. The rock removal limits below are the specified limits of excavation in all locations where rock is present. Additional details are provided in subsequent sections.

2. The Contractor shall remove rock to elevations, which will allow the installation of all utilities and structures shown on the drawings.

    a. The Contractor shall remove rock to the bottom of footing elevation for cantilevered walls.
    b. Around proposed pipe conduits, the Contractor shall remove rock to permit the installation of permanent construction without exceeding 6 inches beneath pipe in trench, and the greater of 24 inches wider than pipe or 36 inches wide.

C. Excess Rock And Processed Rock Fill

1. The Contractor may reuse rock that has been removed on-site if processed to meet the requirements and gradations of Satisfactory Soils, Riprap, and/or Bedding Stone as described above or in Section 02300.

2. The Contractor shall remove and legally dispose of excess rock not used during construction off site.

D. Rock Excavation for the Installation of Structures

1. Boulders encountered during the site preparation should be removed to a depth of at least 12 inches below the bottom foundation elevation for cantilevered retaining walls. Voids that result from boulder removal should be backfilled with compacted "Engineered Fill".

2. Care should be taken when removing rock adjacent to the existing structures to prevent undermining and disturbance of the footing.

END OF SECTION

PART 1.00 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Provisions of contract, and Division 1 Specification Sections, apply to work of this section.

B. See Section 02400 for cofferdam related specifications

1.02 WORK INCLUDED

A. The work covered in this section includes the design, installation, maintenance, and removal of engineered slopes, cofferdams, bulkheads, and shoring, sheeting, and bracing as necessary for the following:

1. To comply with all applicable federal, state and local codes and regulations;

2. To permit the proper installation and construction of the work;

3. To prevent injury to persons or damage to pavements, utilities or structures;

4. To prevent injurious caving or erosion, or loss of ground; or, where shown on the Drawings, necessary for unforeseen reasons, or where requested by the Engineer, all in accordance with the Drawings and Specifications and as directed.

5. Control of water.

B. The work covered in this section also covers pre-construction inspections and monitoring to compare the conditions of existing infrastructure before and after excavations.

C. Note that shallow bedrock is prevalent throughout the site and the installation and effectiveness of steel sheeting or any other driven element will be limited.

1.03 RESPONSIBILITY

A. Sloped excavations shall conform to all Local, State, and Federal regulations.

B. Cofferdams, bulkheads, and shoring, sheeting, and bracing shall be of sufficient strength to safely sustain all loads from the sides of the excavations together with all water pressure and reasonable surcharge.

C. The Contractor shall, at all times, be entirely responsible for the adequacy of cofferdams, bulkheads, and shoring, sheeting, and bracing used to permit the satisfactory and safe installation and construction of the work.

D. The Contractor shall, at all times, provide adequate protection against damage to all existing utilities, structures and completed portions of the work, and shall prevent injury to persons.

E. The Contractor shall determine the limits and final elevations to support construction and comply with the requirements within the Project Documents.

1.04 LIMITATIONS

A. Timber shoring shall not be allowed where removal and proper compaction cannot be attained.

B. Unless the Contractor submits a procedure that demonstrates the removal of sheets, soldier piles, or other components without leaving a void, all driven sheets, soldier piles, and other components extending below the bottom of the excavation or into the embankment shall be permanent.

1.05 SUBMITTALS

A. Pre-Construction Inspection

1. In the event shoring, sheeting, or bracing is needed the Contractor shall provide a pre-construction survey, inclusive of photos, videos, and descriptions of existing deficiencies sealed by a registered Professional Engineer licensed to practice in the State of Rhode Island when:

a. Sheeting is being driven within 100-feet of a building or other structure; inclusive of bridge superstructures and stone masonry walls.
b. At other times deemed appropriate by the Owner or Engineer.

2. Results from additional monitoring requirements (in accordance with Part 3.04 of this Section) shall be submitted within 2 days of acquiring the results.

B. Construction Monitoring Plan

1. At least fourteen (14) calendar days prior to the start of work under this section, submit for review by the Engineer:

a. A plan showing the proposed locations of construction monitoring devices.
b. Specifications and calibration data for monitoring devices.
c. Procedures to be implemented if a threshold or limiting value is reached.
d. Example forms of the daily/weekly reports for the monitoring program.

C. Drawings:

1. At least fourteen (14) calendar days prior to the start of work under this section, submit for review by the Engineer:

a. Drawings
b. Sections
c. Details and other pertinent information regarding shoring sheeting and bracing.

2. The data shown shall include:

a. An overall time schedule for construction.
b. A description of the anticipated sequence of construction.
c. Complete details of the methods, equipment and materials proposed to be used at each work location.
d. Any other pertinent data required for review by the Engineer.

D. Design Computations:

1. The Contractor shall also submit complete computations. The design shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics. It shall include the effects of all surcharge loads which may be reasonably anticipated.

2. The minimum factor of safety for each proposed system shall be at least 1.50.

3. All computations shall be made or sealed by a registered Professional Engineer licensed to practice in the State of Rhode Island. Computations shall bear the stamp of the Engineer.

E. Submittal Review by Engineer:

1. The design and layout will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and methods will be adequate for the work required at the locations of and for the work required by this contract.

PART 2.00 PRODUCTS

2.01 STEEL SHEETING

A. The shapes, sizes, and lengths of steel sheeting to be utilized are at the Contractor's option, unless otherwise shown on the Drawings. Sheeting shall be satisfactory to withstand all driving and construction stresses. Sheeting shall be driven in continuous interlock and adhere to ASTM A 328 Standard Specification for Steel Sheet Piling.

2.02 SUPPORTS

A. Bracing and other supports whether of steel, timber, or other materials shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects, which might impair this strength.

2.03 OTHER SYSTEMS

A. The sizes, shapes and configurations of other systems are at the Contractor’s option and shall be of sufficient configuration necessary to withstand the loads to which it will be subjected.

2.04 OTHER MATERIALS

A. The Contractor shall provide all necessary material, hardware and fastenings necessary for the satisfactory installation of all cofferdams.

2.05 MONITORING EQUIPMENT

A. Deformation monitoring points shall consist of a reflective survey target, survey stake with a PK nail, or an existing feature that can be used that allows for a reproducible survey of horizontal and vertical movement.

B. Crack gages shall consist of calibrated, direct read gages made from overlapping transparent acrylic or glass plates. The gages shall be weather resistant. Gage accuracy shall be to 0.02 inches with a horizontal range of 0.75 inches and a vertical range of 0.375 inches.

C. The Contractor shall use vibration monitors capable of measuring vibration along the transverse, vertical, and longitudinal axes, be accurate to at least 0.005 in/sec, and all vibration monitoring equipment shall have been calibrated within the past year. The vibration monitoring equipment shall be capable of continuous monitoring during construction and be capable of instantaneously alerting construction personnel if a Response or Threshold Value has been exceeded.

PART 3.00 EXECUTION

3.01 GENERAL

A. The Contractor shall take all precautions necessary to prevent lateral or inward movement of material along the sides or the bottoms of excavations.

1. It is expressly understood and agreed that whenever cofferdams, bulkheads or shoring, sheeting, and bracing are used, it shall not relieve the Contractor of the sole responsibility for any damages or injury due to the installation or failure of the cofferdams, bulkheads, or shoring, sheeting, and bracing, or the settling of the backfill, pipelines, or of the adjacent ground, structures, utilities or other work.

3.02 INSTALLATION

A. Where cofferdams, bulkheads, or shoring, sheeting and bracing are used they shall be installed ahead of other work activities.

1. Install to maintain sufficient restraint of the adjacent soil and to prevent movement, excessive inflow of water, and intrusion of soils into or instability of the bottom of the excavations.

2. If voids occur behind the cofferdams, bulkheads, or shoring, sheeting, and bracing, they shall be filled immediately with selected materials from earth excavation to the satisfaction of the Engineer.

3.03 OBSTRUCTIONS DURING STEEL SHEETING DRIVING

A. Note that shallow bedrock is prevalent throughout the site and the installation and effectiveness of steel sheeting or any other driven element will be limited.

B. Where obstructions are encountered that result in a sudden, unexpected increase in penetration resistance and deviation from acceptable tolerances, the Contractor may be required to perform one of the following options:

1. Removal of the obstruction.
2. Extraction, repositioning, and redriving.
3. Addition of extra piling.

C. Pursue the course of action selected by the Engineer. If, in the Engineer's opinion, the obstruction could not have been reasonably anticipated by the Contractor, work done under this Section, will be considered for payment in accordance with the General Conditions.

3.04 INSPECTION

A. The Contractor shall provide inspection prior to and during its operations of all existing utilities, structures and other facilities, which might be disturbed by construction.

1. The Contractor shall monitor and control its construction operations to prevent damage to the existing adjacent utilities, structures and completed portions of the work.

2. The Contractor shall provide photographic and video documentation of the condition of adjacent structures.

3. The Contractor shall provide elevations of structures adjacent to driven steel sheetpile system prior to sheet pile installation.

3.05 CONSTRUCTION MONITORING

A. Construction Monitoring will be required when sheeting is being driven or heavy compaction equipment (excluding hand or remote operated compactors weighing less than 5,000 pounds or with a centrifugal force less than 10,000 pounds) is used within 100-feet of a building or other structure; inclusive of dams, bridge superstructures, and stone masonry walls.

1. It is expressly understood and agreed that the Contractor is responsible for repairing or replacing damaged structures and utilities even if construction monitoring is not performed.

B. Deformation and Crack Monitors:

1. The Contractor will be responsible for determining the location and quantity of deformation points and crack monitors that are installed.

2. Deformation and crack monitors shall be read daily during excavation, support of excavation installation and removal, and compaction activities taking place within 50 feet of structures or utilities being monitored, otherwise readings shall be taken weekly. Daily reports shall be submitted by the end of business the following day, or on the Monday of the following week if the readings are taken weekly.

3. Immediately after installing deformation and crack monitoring devices, two sets of initial readings (performed two days apart) shall be taken to set a baseline and to determine the reliability of the installations.

4. Threshold and Limiting Values for deformation monitoring points:

Monitoring Target	Threshold Value	Limiting Value
Structures	0.25 inch	0.5 inch
Utilities	0.5 inch	1.0 inch

C. Vibration Monitors:

1. Vibration monitoring shall take place daily during, support of excavation installation and removal with vibratory equipment and during compaction with ride-on compaction equipment. Daily reports shall be submitted by the end of business the following day.

2. Threshold and Limiting Values for vibration monitors (Peak Particle Velocity):

Monitoring Target	Threshold Value	Limiting Value
Structures	1.0 in/sec	1.5 in/sec
Utilities	1.0 in/sec	2.0 in/sec

3. If the vibration frequency is between 2.5 and 10 Hertz the Peak Particle Velocity (PPV) shall not exceed 0.5 in/sec. An exceedance of the PPV in this frequency range shall be regarded as an exceedance of a Limiting Value.

D. If a Threshold Value is reached:

1. The Engineer, Contractor, and Owner shall meet to discuss remedial measures, including modifying construction procedures.

2. The Contractor shall increase the vibration or deformation monitoring reporting frequency as requested by the Engineer.

3. The Contractor shall relocate or provide additional monitoring equipment as requested.

4. The Contractor shall implement necessary steps as discussed with the Engineer and Owner so the Limiting Value is not exceeded.

E. If a Limiting Value is reached, all work causing the exceedance of the Limiting Values shall be stopped until remedial measures can be implemented. Work shall only continue at the discretion of the Owner after adequate remedial measures have been implemented by the Contractor to reduce vibrations, manage deformation, or reinforce/support the affected structure or utility.

3.06 REMOVAL

A. Cofferdams/shoring, sheeting, and bracing shall be removed as backfilling is completed, and removal shall be conducted in such a manner so as to avoid any damage to the permanent structure or to other members of the cofferdam/shoring, sheeting, and bracing.

1. Elements of the temporary support structure that cannot be removed as backfilling occurs shall remain permanently.

2. Compaction around temporary support structures shall be 98 percent of the maximum relative compaction.

B. Impact loading on the permanent structure or on members of cofferdam/shoring, sheeting, and bracing structure will not be allowed.

C. During backfilling, temporary support elements shall not be removed until alternative support is available, such as substituted struts, backfill, or ability of cofferdam/shoring, sheeting, and bracing to act as cantilever without detrimental deflection. All voids left by removal of cofferdam/shoring, sheeting, and bracing shall be immediately filled.

D. All cofferdam/shoring, sheeting, and bracing shall be removed at completion unless otherwise shown on the Drawings or otherwise stated in the PART 1.04 - LIMITATIONS of this section

or as stated in Section 02400 of these Specifications.

END OF SECTION

SECTION 02270
EROSION AND SEDIMENT CONTROL

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. Work covered under this Section shall include all work for erosion and sediment control.

B. All work shall conform to the requirements stated herein and to the requirements of the regulatory agencies having jurisdiction over the areas of work.

1.02 SUBMITTALS

A. Provide the following submittals:

1. Manufacturer's certificate of compliance for geotextiles.

1.03 COMPLIANCE

A. All work shall be done in compliance with the provisions of all local, state and federal regulatory agencies. Failure to comply with these provisions shall constitute grounds for the Owner ordering work to cease until such provisions are met.

B. If required, the Contractor shall meet with the RIDEM and other regulatory agencies with purview for clarification regarding requirements of the execution of, and compliance with, environmental protection programs. The Contractor shall familiarize itself with the nature of the work to be performed. The Contractor shall be responsible for scheduling its submittals and/or meetings, if required, with the regulatory agencies.

C. Contractor is responsible for updating and filing the RIPDES General Permit for Stormwater Discharge associated with Construction Activity.

PART 2.00 - PRODUCTS

2.01 STRAWBALES

A. Bales of straw fastened with wire and have a minimum size of 1 foot by 1.5 feet by 3 feet and conform to the applicable portions of Rhode Island Standard Specifications for Road and Bridge Construction, latest edition. Bales shall be made of straw with forty pounds minimum weight and one hundred and twenty pounds maximum weight. They should be either wire or nylon bound.

B. Hay bales are prohibited on this project.

2.02 SILTATION FENCE

A. Siltation fence shall conform to RI Std. detail 9.2.0.

B. Filter fabric siltation fencing shall be a woven filter fabric having a permittivity of not less than 0.05 sec-1, a water flow rate of a minimum 12 gallons per minute per square foot, and a grab tensile strength of a minimum of 100 lbs. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics.

C. Silt fences or sedimentation barriers shall consist of wood posts with industrial support netting and sediment control filter fabric attached.

D. Wood post shall be standard 2”x2”x4.5’ long hardwood stakes commonly used to support filter fabric. Silt fence shall be furnished standard with filter fabric attached to hardwood posts and spaced at a maximum distance of 8 feet.

E. Provide suitable heavy nylon cord for securing abutting silt fence posts.

F. The filter fabric material shall be needle punched non-woven polypropylene geotextile conforming to the following criteria:

Fabric Properties	Minimum Acceptance Value	Test Method
Grab Tensile Strength (1bs)	124	ASTM D4632
Elongation of Failure (%)	15	ASTM D4632
Mullen Burst Strength (PSI)	300	ASTM D3786
Puncture Strength (1bs)	100	ASTM D4833
Flow Rate (gal/min/sf)	10	ASTM D4491
Apparent Opening Size (sieve)	30	ASTM D4751
Ultraviolet Radiation (% strength retained)	70	ASTM D4355
Unit Weight	5	ASTM D3776
Thickness	80	ASTM D1777
Trapezoidal Tear Strength	50	ASTM D4533
Permittivity	.01	ASTM D4491

G. Acceptable filter fabric materials include “Mirafi Envirofence”, “Propex Silt Stop” by Amoco Fabrics Co or equal approved by the Designer.

H. Control fabric shall be at least 3 feet wide.

2.03 EROSION CONTROL MATS

A. Erosion control mats shall consist of temporary degradable rolled erosion control product composed of processed natural or polymer fibers mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment

2.04 FILTER SOCKS

A. Filter Socks are biodegradable sediment-trapping devices. Manufacturers include SiltSoxx, Corr Logs, Straw Wattles, or equal.

2.05 TURBIDITY BARRIER

A. Turbidity barrier shall extend a minimum of the full depth of the channel during high tide water levels. Barrier shall be capable of enduring conditions at the site. Turbidity barrier shall be secured to prevent sediment from migrating into water bodies beyond the limits of work.

2.06 WOODEN STAKES

A. Stakes: Oak wood, minimum 2-inch by 2-inch, by minimum 54 inches long.

2.07 WATER

A. Water used for dust control and equipment washes shall be clean and free of salt, oil, and other injurious materials. Contractor shall coordinate with the State of Rhode Island and the Towns of Richmond and Hopkinton before drawing water from Wyoming Upper Reservoir or before drawing water from other municipal sources. The Contractor will be responsible for any costs associated with using municipal water or permits associated with drawing water from the Wyoming Upper Reservoir; otherwise the Contractor shall provide all necessary water.

2.08 TEMPORARY ACCESS ROADS

A. Geotextile: A non-woven geotextile fabric that meets the requirements of RI Std. detail 9.9.0. Fabric shall be Type I geotextile as specified in SECTION 02200 or approved equal.

B. The surface course of the first 50 feet of the access road off of any paved roadway shall consist of crushed stone. Beyond 50-feet, the roadway can consist of Engineered Fill or Gravel Borrow.

PART 3.00 - EXECUTION

A. If necessary, the Contractor shall furnish, install, and remove dewatering basins in accordance with RI Std. 9.7.0.

B. The Contractor shall maintain baled straw, filter socks, and siltation fence in good condition, rotating bales and replacing fencing periodically to maximize their effectiveness as sediment traps. The Contractor shall remove accumulated sediment periodically as directed by the Engineer. Remove baled straw, filter socks, and siltation fence in its entirety upon completion of the Work.

C. The Contractor is advised that river flows and water levels of resource areas may vary substantially due to climatic and seasonal conditions and Contractor shall be responsible for controlling and handling ground and or surface water regardless of the volume of water and regardless of whether this flow is due to flood waters from storms.

D. The Contractor shall take every precaution to minimize and control erosion and turbidity within the contract area. These precautions shall be subject to approval by the Engineer and shall include, but not necessarily be limited to, the following:

1. Straw bale erosion barriers and sedimentation control fencing shall be staked in place down gradient from all exposed materials storage areas in order to reduce the amount of suspended solids in runoff water. The Contractor shall promptly remove any sedimentation buildup over 6 inches in depth that accumulates behind the erosion barriers. Barriers shall be checked after every storm and at regular weekly intervals.

E. Removal and clean up: All temporary erosion control facilities and accumulated sediments shall be removed and legally disposed in a neat and workmanlike manner when all disturbed areas have been satisfactorily stabilized.

F. Provide approved jute mesh or erosion control mats installed in accordance with manufacturer's recommendations on slopes steeper than 3H:1V or as otherwise required or as requested by the Owner's representative.

END OF SECTION

SECTION 02300
RIPRAP

PART 1.00 - GENERAL

1.01 SCOPE OF WORK:

A. Work covered by this specification includes; all material, labor, plant and equipment required to construct the upstream and downstream riprap slopes at the right abutment and the riprap approach for the low-level outlet intake and discharge areas on the drawings and as called for herein. The work includes; excavation, grading and furnishing, handling, and placing riprap and bedding stone.

1.02 QUALITY ASSURANCE:

A. The work shall be performed by a qualified contractor having experience in constructing riprap slope protection of similar type.

B. Provide stone with the physical properties required by ASTM Standard C33 for quarry stone for producing coarse aggregate for concrete. Conform to ASTM C88 and C131 for the testing for soundness and resistance to abrasion. Conform to the requirements of the abrasion test for stone and provide the requirements of the soundness test for all stone. Use representative chips, one inch in size taken from the stone as furnished.

C. Employ and pay for an independent testing laboratory in the business of testing soils and soil aggregate. The laboratory shall have a minimum of 10 years experience, be accredited by the American Association of State Highway and Transportation Officials (AASHTO) and have completed 3 jobs of equivalent size and complexity.

1.03 REFERENCES:

A. American Society of Testing and Materials Publications:

1. C33: Concrete Aggregates
2. C88: Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
3. C127: Specific Gravity and Absorption of Coarse Aggregate.
4. C131: Resistance of Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.04 SUBMITTALS:

A. Submit the following in accordance with Section 01340:

1. Independent laboratory test results for unit weight and for gradation specified in subparts 2.01 and 2.02 and conforming to all requirements in subpart 1.03. Submit before delivery and within one week after subsequent tests.
2. Submit independent testing laboratory's qualifications as specified in paragraph 1.3 C. Include with all references the names, current addresses, and telephone numbers of person in charge of representing the Owner or Owners at the time of previous work.

PART 2 - MATERIALS

2.01 QUALITY OF STONE

A. All stone shall consist of sound, hard, dense, durable rock which has been separated from bedrock in place by quarrying. Unit weight of stone shall not be less than 165 pounds per cubic foot, dry in air. The stone shall be free from open or incipient cracks, seams and fissures, and from porous structure, solution cavities, planes of weakness, and from component minerals and cementing or bonding materials that may contribute to spalling or breakdown during handling and placing and from wave action and chemical action from air and water. No stone shall be used in which the least principal dimension is less than one third of the greatest dimension. Slabs, boulders and round stones will be rejected. Stone shall, in general, be of irregular and angular shape; however, not more than 25% may be roughly rectangular, provided such stone is placed with its long axis perpendicular to the length of the structure.

B. Gradation of imported stone shall meet the requirements as specified in the following sections. The contractor shall coordinate with his supplier as necessary to provide material in accordance with these specifications.

C. Stone used for dumped riprap shall be hard, durable, angular in shape, resistant to weathering and shall meet the gradation requirement specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted unless authorized by special provisions.

D. Stone shall be free from overburden, spoil, shale, and organic material

E. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified. Stones smaller than the specified 10% size and spalls will not be permitted in an amount exceeding 10% by weight of each load.

F. Control of gradation will be by visual inspection. The Contractor shall provide at the locations specified a mass of rock of at least five tons meeting the gradation for the class specified. The sample at the construction site may be a part of the finished riprap covering. At the quarry, an additional sample shall be provided. These samples shall be used as a frequent reference for judging the gradation of the riprap supplied. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of two random truckloads of stone. Mechanical equipment, a sorting site and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost to the Owner.

2.02 RIPRAP

A. Riprap shall be utilized to construct the upstream slope, downstream slope, and low-level outlet approach. Riprap shall be imported material conforming Type R-6 of the RIDOT Standard Specifications with the following gradations:

Riprap Size (in.)	Maximum % of Total Weight Smaller Than Given Size
26	100
13	50
8	15

B. Riprap Appearance: The riprap shall be clean and have a uniform appearance. The visual appearance of the proposed stone must be approved by the Engineer.

C. Salvaged riprap from the demolished downstream wall or existing upstream slope shall be used prior to importing of riprap material. Reuse of stone that does not meet specification shall be assumed unless the Engineer or Owner state otherwise.

2.03 ARMOR STONE

A. Armor stone shall be utilized to construct the lower 5 feet (elevation) of the downstream slope. Armor Stone shall be imported material conforming Type R-7 of the RIDOT Standard Specifications with the following gradations:

Riprap Size (in.)	Maximum % of Total Weight Smaller Than Given Size
34	100
18	50
14	15

B. Riprap Appearance: The riprap shall be clean and have a uniform appearance. The visual appearance of the proposed stone must be approved by the Engineer.

C. Salvaged armor stone from the demolished downstream wall or existing upstream slope shall be used prior to importing of riprap material. Reuse of stone that does not meet specification shall be at the discretion Engineer or Owner.

2.04 BEDDING STONE

A. Bedding stone for riprap and armor stone slope shall be imported material conforming to Type R-3, of the RIDOT Standard Specifications with the following gradations:

Bedding Stone Size (in.)	Maximum % of Total Weight Smaller than Given Size
8	100
4	50
2	15

2.05 GEOTEXTILE FABRIC

A. Refer to Section 02200; EARTHWORK, for material specifications.

2.06 REJECTED STONE

A. Any stone not meeting the requirements of these specifications will be rejected and shall be removed from the site and replaced with suitable stone at the sole expense of the Contractor.

2.07 REUSED MATERIAL

A. Existing riprap along the outbound slope shall be salvaged during the regrading process and reused to the extent practical.

PART 3 - EXECUTION

3.01 GENERAL

A. Prior to commencing work, the Contractor shall establish limits of disturbance and place construction control markers clearly visible and understandable to workers in the field. The contractor shall exercise due care so as not to disturb adjacent structures and shall leave the site in clean and orderly condition upon completion of the work.

B. Placement of riprap shall be from the base of the slope upward. Height of freefall of riprap shall be determined by the Engineer, but in no case shall this height exceed one foot.

3.02 LAYING GEOTEXTILE FOR BEDDING STONE PLACEMENT

A. The area shall be graded smooth and all stones, roots, sticks, or other foreign material which would interfere with the fabric being completely in contact with the soil shall be removed prior to placing the fabric. The fabric shall be placed loosely and the machine direction of the fabric laid perpendicular to the alignment of the dam. Pinning or stapling may be required to hold the geotextile in place. Separate pieces of fabric shall be joined by overlapping or sewing. The fabric in the overlapped joints shall be placed with a minimum overlap of 24 inches. After placement, the fabric shall be exposed no longer than 48 hours prior to covering.

B. Damaged areas shall be covered with a patch of fabric using a three-foot overlap in all directions.

3.03 BEDDING STONE PLACEMENT

A. Bedding stone shall only be placed under Riprap or Armor stone if the material would otherwise be placed atop earthen fill material.

B. Stone shall be carefully selected as to size and shape; and placed to obtain firm contact with the maximum number of adjacent stones in order to obtain the best possible interlocking.

C. Bedding stone shall be placed in areas as indicated on the Drawings.

3.04 RIPRAP AND ARMOR STONE PLACEMENT

A. Riprap and armor stone shall be placed on bedding stone underlain by geotextile fabric within the limits shown on the drawings. Stones can be dumped into place by suitably sized equipment; however, stones shall be carefully selected as to size and shape and placed to obtain firm contact with the maximum number of adjacent stones in order to obtain the best possible interlocking. The face of the slope cover stone is to be left rough with placing efforts concentrated on insuring that each stone is firmly set and well supported by underlying and adjacent stones. Obtaining a perfectly smooth slope face is not desirable, however, no individual stone shall project more than 3 inches outside of the theoretical slope line nor less than 3 inches inside the design slope line, with an average tolerance of 1.5 inches from the design line. Rectangular pieces shall be placed with their long axis perpendicular to structures length.

B. Stone for riprap and armor stone shall be placed on the prepared subgrade in a manner which will produce a reasonably well-graded mass of stone with the minimum practicable percentage of voids. The entire mass of stone shall be placed so as to be in conformance with the lines, grades and thicknesses shown on the plans. Riprap and armor stone shall be placed to its full course thickness at one operation and in such a manner as to avoid displacing the underlying material. Placing of riprap and armor stone in layers, or by dumping into chutes, or by similar methods likely to cause segregation will not be permitted.

D. The larger stones shall be well distributed and the entire mass of stone shall conform to the gradation specified. All material going into riprap protection shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of stone.

E. It is the intent of these specifications to produce a fairly compact riprap and armor stone protection in which all sizes of material are placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure the results specified.

E. Riprap and armor stone shall be placed in a manner to prevent damage to the geotextile fabric.

END OF SECTION

PART 1.00 - GENERAL

1.01 RELATED DOCUMENTS

A. Section 02250.

1.02 WORK INCLUDED

B. Work covered under this section consists of the dewatering, control, and diversion of water as required to perform the Work.

C. The Contractor shall have a diversion system capable of accommodating flows associated with the 10-year storm event as defined in Section 01070 without damaging the work area.

D. Beyond the 10-year storm event and up to the 100-year storm event, the Construction Flood Contingency Plan shall address flows associated with the 100-year storm event without compromising the dam.

E. The contractor shall have on-site durable materials in sufficient quantities to fill excavations and resist erosion during any breaching and/or excavation along the dam. The construction flood contingency plan shall state the types of materials that will be on-site and the quantities

1.03 WATER LEVELS

A. The Wood River flows at various levels throughout the year and is heavily dependent on local precipitation. The Contractor can view data on nearby USGS stream gauges on the USGS website (http://waterdata.usgs.gov/ri/nwis/current/?type=flow). The nearest stream gauge (USGS 01118000) is located approximately 1.75 miles downstream of the project site. Another stream gauge (USGS 01117800) is located approximately 5.8 miles upstream of the project site.

B. For purposes of determining if a storm event was exceeded the upstream gauge (USGS 01117800) shall be referenced.

C. At no time shall the Contractor restrict the flow of the Wood River.

D. Seasonally appropriate base flows shall be defined as the following:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Seasonally Appropriate Base Flow, CFS[1]	130	154	190	196	130	74.6	42.2	31.8	32.4	40.5	75.1	121

E. A construction drawdown to the elevation of the existing sluiceway channel, approximately elevation 91.0 feet, shall be permitted.

[1] Based on the "Modified Aquatic Base Flow (RI-ABF) for Rhode Island" Prepared by Alisa R. Richardson, P.E., RIDEM Office of Water Resources, March 2005. From Appendix A, Referencing RI01118000 for a 57.8 square mile drainage basin.

F. The Contractor shall not draw the Wyoming Upper Reservoir below the construction pool elevation as defined in Section 01070 at any time.

G. The Contractor shall be responsible for protecting the Work from increased water levels from Wood River flows and increases in the ground water elevation.

1.04 SUBMITTALS

A. Drawings:

1. At least ten (10) calendar days prior to the start of dewatering or cofferdam erection, submit for review by the Engineer.
   a. Drawings
   b. Sections
   c. Details and other pertinent information.
   d. Cofferdam designer must submit resume with design and have experience with at least 5 similar designs in the past 5 years.
   e. Material providers for the cofferdam shall provide written confirmation that their product(s) are new and/or are rated to withstand the forces expected for the duration expected. If limitations are present those limitations shall be stated.
   f. Construction Flood Contingency Plan: Plan detailing the Contractor's means and methods for stabilizing the work area and emergency notification procedures if the work area becomes subject to flooding as a result of a storm event or cofferdam failure.
2. The data shown shall include:
   a. An overall schedule for dewatering, control, and diversion of water.
   b. A description of the anticipated sequence of construction.
   c. Complete details of methods, equipment, and materials proposed to be used.
   d. Any other pertinent data required for review by the Engineer.
   e. The Contractor shall coordinate this submittal with submittal requirements specified in Section 02270-EROSION AND SEDIMENT CONTROL and Section 02250-SHORING, SHEETING, AND BRACING.

B. Design Computations:

1. The Contractor shall also submit complete computations for the design of the dewatering system and for cofferdam(s).
2. All computations shall be made by a registered Professional Engineer licensed to practice in the State of Rhode Island. Computations shall bear the stamp of the Engineer.
3. The minimum factor of safety for each proposed cofferdam system shall be 1.50.

C. Construction Flood Contingency Plan:

1. The Contractor shall have in place a Construction Flood Contingency Plan to accommodate flows associated with the 10-year storm event.
   a. During the course of the proposed Phase II work, the cofferdam will be allowed to overtop to accommodate storm events larger than the 10-year storm event.
   b. The work area shall be stabilized to prevent the erosion of soils within the work area
   c. The cofferdam shall be stabilized to prevent a failure of the cofferdam and prevent the uncontrolled release of impounded water.

2. Beyond the 10-year storm event and up to the 100-year storm event, the Construction Flood Contingency Plan shall address flows associated with the 100-year storm event without compromising the dam.

3. The plan shall include descriptions of the following elements:

   a. Project Summary: including schedule of operations.
   b. Temporary Cofferdam System(s): including description, design water level, top elevation, installation procedure, overtopping protection, scour protection, erosion protection during overtopping.
   c. Water Control Systems: including description of pumps, operation of pumps, and operation/installation of temporary cofferdam during normal and flood conditions.
   d. Site Hydrology, especially as it relates to temporary cofferdam design and emergency demobilization from the river work area.
   e. Construction-Phase Water Control Monitoring Program: including river levels, precipitation and river forecasts, site observations and monitoring. The program shall address frequency of observation during normal and flood flow periods, nights, weekends and holidays.
   f. Potential sources of Wood River information include:
      i. Temporary staff gage(s) installed by the Contractor in the river.
      ii. The downstream USGS wood River staff gage (01118000)
      iii. The upstream USGS wood River staff gage (01117800)
      iv. http://waterdata.usgs.gov/ri/nwis/uv/?site_no=01118000&PARAmeter_cd=00065,00060
      v. The NWS Advanced Hydrologic Prediction Service forecast for USGS 01118000 http://water.weather.gov/ahps2/hydrograph.php?wfo=box&gage=hopr1
   g. Action Thresholds based on monitoring program results.
   h. Contingency Actions: including specific actions to be taken in response to exceedances of Action Thresholds, lists of on-site and off-site equipment and material quantities required for contingency actions and emergency demobilization. For off-site equipment and materials, indicate mobilization time to-site. Include schedule of contingency actions, including emergency demobilizations during nights, weekends and holidays. Address methods of protection for work outside of protected area (e.g. fresh concrete, temporary cofferdams, open fills).
   i. The construction flood contingency plan shall state the types and quantities of materials that will be on-site to satisfy the requirement set forth in Section 024000 Part 1.01.E.

4. The plan shall bear the stamp of a registered Professional Engineer licensed to practice in the State of Rhode Island.

PART 2.00 - PRODUCTS

A. The Contractor shall provide all materials and equipment including, but not limited to, sandbags, barriers, impermeable fabrics, pipe, fittings, valves, pumps, tools, fuel and other appurtenances in suitable and adequate quantities as required to control water.

B. COFFERDAMS
   1. Steel Sheeting: The shapes, sizes, and lengths of steel sheeting to be utilized are at the Contractor's option, unless otherwise shown on the Drawings. Sheeting shall be satisfactory to

withstand all driving and construction stresses. Sheeting shall be driven in continuous interlock and adhere to ASTM A328.

2. Water-Inflated Dams: The shapes, sizes and lengths of water-inflated dams to be utilized are at the Contractor's option, unless otherwise shown on the Drawings. Water inflated dams shall be satisfactory for the intended purpose as manufactured by Aqua-Barrier or approved equal (Contact: 1-800-245-0199).
3. Porta Dams: The shapes, sizes and lengths of Porta-Dams to be utilized are at the Contractor's option unless otherwise shown on the Drawings. Porta-Dams shall be satisfactory for the intended purpose as manufactured by Porta-Dam (Contact: Mr. Don Boyer, 1-800-346-4793).
4. Supports: Bracing and other supports whether of steel, timber, or other materials shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects, which might impair this strength.
5. Other Materials: The Contractor shall provide all necessary hardware and fastenings necessary for the satisfactory installation of all cofferdams.

PART 3.00 - EXECUTION

3.01 SURFACE DRAINAGE

A. The Contractor shall intercept and divert surface drainage away from the work sites by the use of dikes, curb walls, ditches, sumps or other means. The Contractor shall design surface drainage systems so that they do not cause erosion on or off the site. Surface runoff shall be controlled to prevent entry of water into excavations. The Contractor shall remove drainage systems when no longer needed.

3.02 WATER CONTROL IN EXCAVATIONS

A. The Contractor shall use water control methods, which are appropriate to the ground conditions, the construction operations, and the requirements of these Contract Documents. The methods will involve removal of water within the excavation and may involve removal of water outside the excavation or construction of facilities to control water movement into the excavation. Water control measures shall minimize adverse effects of elevated or reduced water pressure on the work, the surrounding ground and adjacent facilities and structures. The water control measures shall be designed and operated so as to prevent removal of in-situ materials, or loosening or softening of in-situ materials within the excavation. The Contractor shall control groundwater and surface water such that the construction of open cut pipelines, and other structures will be performed without adverse effects of water, and to prevent hydrostatic uplift pressures until construction has been completed. Water shall be controlled during periods when concrete (except tremie concrete) is being placed, when pipe is being laid, when drainage structures are being installed, and at such other times as is necessary for the safe execution of the work.

B. The existing materials found within the impoundment typically have significant fines content, which can trap groundwater within the existing soil even long after a precipitation event or after ground water has lowered. This trapped water often leaches into an open excavation, which if not controlled, could adversely affect subgrade preparation and backfilling operations. The Contractor should anticipate and provide means for controlling this issue during all earthwork operations.

C. If the Contractor encounters large amounts of water entering the excavation, immediate action shall be taken to control the water inflow. A large amount of inflow requiring control shall be defined as

that which adversely affects the performance of the work or has the potential of causing loss or damage to adjacent property or structures.

3.03 PROPERTY LOSSES FROM REMOVAL OR DISTURBANCE OF GROUNDWATER

A. Any structure, including but not limited to buildings, bridges, streets, and utilities that become unstable or vulnerable to settlement due to removal or disturbance of groundwater will be supported immediately by the Contractor. Support shall include but not be limited to bracing, underpinning, or compaction grouting.

B. All loss or damage arising from removal or disturbance of groundwater, including but not limited to claims for subsidence and the loss of structure support, that may occur in the progression of the Work shall be sustained and borne by the Contractor. If the Contractor needs to correct the damage resulting from his operations, the Owner may, 30 days after notifying the Contractor in writing, proceed to repair, rebuild or otherwise restore such damaged property as may be deemed necessary, and the cost thereof shall be deducted from compensation which may be or become due to the Contractor under this Contract.

3.04 COFFERDAMS

A. General: It is expressly understood and agreed that whenever cofferdams and bracing are used, it shall not relieve the Contractor of the sole responsibility for any damages or injury due to the installation or failure of the cofferdams and bracing.

B. Beyond the 10-year storm event and up to the 100-year storm event, the Construction Flood Contingency Plan shall address flows associated with the 100-year storm event without compromising the dam. The Contractor shall be fairly compensated for efforts expended to address flows greater than the 10-year storm event with profit limited to 10% and overhead limited to 12%.

C. Installation: Where cofferdams and bracing are used they shall be installed ahead of other work activities.

1. Install to maintain sufficient restraint of the adjacent soil and to prevent movement, excessive inflow of water, and intrusion of soils into or instability of the bottom of the cofferdams.
2. If excessive leakage occurs behind the cofferdams, they shall be repaired and stabilized immediately to the satisfaction of the Engineer.

D. Prior to excavation of downstream soils and/or breaching of the dam below the existing top of dam elevation, the Contractor shall demonstrate that the area downstream of the cofferdam can be fully dewatered as designed. Work behind a cofferdam shall not commence if uncontrolled water flow, piping, or other signs of seepage or structural instability at the cofferdam are present.

E. Removal:

1. Cofferdams and bracing shall be removed in such a manner so as to avoid any damage to the permanent structure or to other members of the cofferdam and bracing. Impact loading on the permanent structure or on members of cofferdam and bracing structure will not be allowed.

2. All below grade portions of the cofferdam within the influence area of the dam embankment shall be abandoned in place as determined necessary by the Engineer. All above grade portions

shall be carefully separated from the below grade portions as to not disturb the below grade portions. All above grade portions shall than be removed.

END OF SECTION

SECTION 02650
PERMEATION GROUTING

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. This section covers the work associated with grouting as indicated on the Drawings.

B. The purpose of the grouting program is to reduce seepage/leakage through the following areas:

1. Known seepage pathways adjacent to spillway training walls.
2. Visible leakage through the center embankment

1.02 SUBMITTALS

A. The Contractor shall submit to the Engineer in advance a cementitious grout mix design for materials and additives meeting the specified requirements. Submittals shall include physical and chemical analyses and specific gravity of the fly ash, and tests of the grout slurry by an approved laboratory showing 1-day, 3-day, and 7-day compressive strengths, flow cone times, and time of initial set. An approved laboratory is defined as a laboratory, which is regularly inspected by the Cement and Concrete Reference Laboratory. The 7-day strength shall not be less than 2.8 MPa (400 psi) as measured by AASHTO T 106.

B. Contractor shall also submit their proposed plan for the grouting, including drilling equipment, grout mixing equipment, QA/QC plan, means of grout placement, hole depth, grouting pressures and means of measuring grouting pressures, grout hole location and naming convention, examples of grout take logs, means of measuring grout volume and overall schedule.

C. Contractor shall submit their source of mixing water. Tests for grout compressive strengths, flow cone times, and time of initial set shall be completed with a grout mix using the same mixing water source.

D. Chemical grouts may be considered for use; however, in addition to the mix design, flow cone times, and time of initial set information, extensive information shall be provided regarding the chemical grouts toxicity and potential to leech/pollute the groundwater.

E. All work, procedures and materials shall be in accordance with ACOE Engineering Manual EM 1110-2-3506 and Technical Manual TM 5-818-6 / AFM 88-32.

F. Contractor shall submit best management practices to prevent the release of grout slurry into downstream waterbodies and wetland areas.

PART 2.00 - PRODUCTS

2.01 GENERAL

A. The Contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the work shown and specified.

B. The 7-day strength shall not be less than 2.8 MPa (400 psi) as measured by AASHTO T 106.

C. If ambient temperatures are below 13ºC (55ºF), an accelerator acceptable to the Engineer shall be used.

D. Fluidity of the grout slurry shall be measured by Corps of Engineers Flow Cone Method, ORD-C 79-

77. Time of efflux for cement/fly ash grouts shall range from 16 to 25 seconds. The Contractor shall furnish a flow cone for this test and shall perform a minimum of three tests per day, or per shift, in the presence of the site observer. More tests will be performed as deemed necessary by the Engineer. Adjustments to the grout mixture shall be made during the sub-sealing operation to meet flow requirements.

E. The grout plant shall consist of a positive displacement cement injection pump and mixing equipment that is capable of providing a thoroughly mixed and homogenous mixture.

F. Drilling equipment must be capable of drilling continuous and straight holes within varying soil conditions ranging from very soft to very hard. The Contractor is responsible for providing appropriate drill bits for penetration into the varying materials that may be encountered.

G. Drills or other devices capable of advancing the grout holes shall be in good condition. The downfeed pressure of the drills or devices, whether by hand or mechanical means shall not damage any adjacent structures.

H. The Contractor shall also furnish all necessary hoses; valving; valve manifolds; positive cut-off; bypass provisions to control pressure and volume; pressure gauges with gauge protectors; and expanding packers or hose for positive seal during grout injection. All gauges and valves along the grout line shall be accurately calibrated to ensure grout installation at the specified pressures.

I. The Contractor shall provide a reliable device for measuring the amount of grout installed. Flow recorders shall be located as close as possible to the hole opening, and must be properly calibrated to accurately indicate the incremental and total flow passing through the grout hose. Gauges shall be capable of detecting flows to 0.1 GPM.

J. Grout mixes shall be tested for strength and temperature per each day of grouting activity or every 1000 gallons installed each day.

2.02 GROUT MIX

A. Provide Portland cement according to ASTM C 150, Type I. Fly Ash shall meet the requirements of ASTM C 618. High range water reducing admixture shall meet the requirements of ASTM C 494, Type F. The mix design for void filling grout shall be as follows:

1. One 42.6 kg (94 pound) sack of Portland cement;
2. Three 31.8 kg (70 pound) sacks of fly ash;
3. 355 mL (12 ounces) of high range water reducing admixture;
4. Water to achieve required fluidity.
5. Approved admixtures as proposed by the Contractor to meet project/location specific requirements (i.e. thixotropic stabilizers)

B. This mix may be altered in the field to achieve the required viscosity and flow characteristic.

2.03 MIXING WATER

A. Mixing water shall be acquired from potable sources.

B. When mixing water cannot be acquired from a potable source, the Contractor shall demonstrate that the mixing water meets the requirements of ASTM C1602 (2012d): Mixing Water Used in Production of Hydraulic Cement Concrete.

C. All testing for strengths shall use mixing water from the same source to be used on-site.

PART 3.00 - EXECUTION

3.01 GENERAL

A. All drilling and grouting equipment shall be of a type, capacity and mechanical condition suitable for performing the work, as determined by the Engineer. The Contactor is responsible for ensuring that the equipment and the layout shall meet all applicable requirements of local, State, and Federal regulations and codes, both safety and otherwise.

B. The Contractor shall furnish all records of total volumes of grout placed for each day, within each hole, and within each sub-zone along the grout pipe. The Contractor shall note any changes to the mix design during grout installation, as well as reasons for modifying the design.

1. The embankment soil zone (Zone 1) is defined as extending from the crest to the top of bedrock.
2. The bedrock zone (Zone 2) is defined as starting at the bottom of the embankment soil zone and extending into bedrock.
3. Sub-zones within the grout pipe shall be considered 2-foot maximum intervals (or smaller if determined by the Contractors grouting method), with intervals restarting at the transition between embankment and native soils.

C. The Contractor shall prevent the airborne release of Portland cements, ultrafine cements, fly ash, silica fume, and any other cementitious our chemical grout component or admixture. Repeated airborne release of these particulates can result in a temporary work stoppage until proper controls can be implemented.

D. Grouting shall not be completed if ambient temperatures will fall below 45-degrees Fahrenheit within 24-hours after installation, unless ground heating equipment is used to maintain a surface temperature of at least 45-degrees Fahrenheit.

3.02 DRILLING

A. Drilling shall be performed in accordance with ACOE Engineering Manual EM 1110-2-3506 and Technical Manual TM 5-818-6 / AFM 88-32. Hole creation by water jetting, air jetting, or lancing shall not be permitted.

B. Advancing Holes: The grout hole pattern shall be as indicated on the project drawings. Additional spilt spacing shall be completed as necessary to provide a uniform curtain.

C. Hole Order: Hole order shall be as follows primary hole set followed by secondary hole set followed by tertiary hole set followed by quaternary hole set. Hole sets shall be drilled and grouted prior to moving onto the next sequential set. Changes in hole order shall be detailed by the Contractor and approved by the Engineer prior to execution.

D. Grout holes shall not be larger than 76 mm (3 inches) in diameter. Holes shall be round and advanced to create the curtain wall to the depths indicated on the Drawings.

E. Water shall be used to remove the cuttings during drilling operations. The use of high-pressure air shall not be used to clear drill holes. After the hole has been drilled, the Contractor shall cap each hole to prevent debris from entering the grout pipe. The Contractor shall clean all debris from the grout pipes

prior to grout installation, with any clogged or blocked pipe replaced by the Contractor at no additional cost to the Owner.

F. Uncased drill holes shall not remain ungrouted for more than two calendar days. The Engineer will have final determination as to whether cased holes can remain open over weekends or holidays; however, in no case shall and uncased and ungrouted hole be left open over weekends or holidays.

G. Redrilling of grout holes that were left uncased shall be completed at no additional cost.

3.03 GROUTING

A. All grouting operations shall be performed in the presence of the Engineer.

B. Grout shall be placed using upstage grouting methods.

1. End-of-Casing grout techniques may be used with the following requirements:
   a. If the ground conditions require a change in the grout mix, as determined by the Engineer, then the lower stage grouts must be allowed to set prior to resuming pumping. Time to allow for set will be borne by the Contractor at no additional cost.
   b. The Contractor shall be responsible for plugging the annulus of the casing/soil interface at the top of the casing to prevent the loss of grout through the top of the casing.
2. Sleeve-port pipe grouting techniques may be used with the following requirements:
   a. Double packer systems shall be used to pump grout in the desired zones.
   b. Sleeve-ports shall be at 2 foot intervals or less.
   c. Grout to seal the annulus between the sleeve-port pipe and the soil shall be a weak cement-bentonite grout capable of being fractured using short bursts (2-3 seconds) of pressure increases.
   d. Contractor shall incrementally increase pressure in short bursts starting at the allowed pressure stated in Part 3.03.E.1 until the annulus grout has been compromised and grouting can commence.

C. Grouting sequence shall be field determined, as accepted by the Engineer. Grout shall be placed at each zone along the grout pipe, with a maximum spacing of 2 feet between zones.

D. If during the course of grouting the engineer determines that grout takes are too low or too high for the specific zone, the Contractor shall adjust the application of the grout mixes accordingly.

E. The Contractor shall grout one hole at a time using an expanding rubber packer or hose on the nozzle connected to the discharge of the grout pump.

1. Pumping pressure at the point of placement to facilitated grout flow shall be limited such that heaving of the surrounding soils and or stone walls does not occur and in no case shall exceed

the following table, or as approved by the Engineer.

Depth of Injection (ft)	Max. Transient Pressure (PSI)	Depth of Injection (ft)	Max. Transient Pressure (PSI)
0-2	0.25	10-12	4.0
2-4	0.5	12-14	5.0
4-6	1.0	14-16	6.0
6-8	2.0	16-18	7.0
8-10	3.0	18-20	8.0

2. Pumping pressures for void filling shall be no greater than 69 kPa (5 psi) or as approved by the Engineer.
3. When using sleeve-port grouting techniques, the grout pressure within the sleeve port can be temporarily exceeded (2-3 second duration) to facilitate fracturing of the grouted annulus and introduce grout to the soil.

F. The Contractor shall be responsible for accurate pressure and flow measurement and control of the grout hose, by means of inline valves (Pressure and flowmeter) placed as close as possible to the hole opening. Calculations showing expected headloss through grout hoses/pipes to estimate the grout pressure at the point of placement shall be provided by the Contractor.

G. Subsealing: Immediately, after the nozzle is removed, the grout hole shall be temporarily sealed with a method determined by the Contractor and accepted by the Engineer. The seal shall remain in place until the grout in the hole is not disturbed by adjacent grouting. Grout subsealing shall not be performed when ambient temperatures are below 2ºC (35ºF). In addition, subsealing operations shall not be performed if the subgrade material is frozen.

H. Mixed grout held in the mixer or injection sump for more than the initial set time of the grout after mixing shall not be used.

I. Grouting operation shall be started with a thin mix, as approved by the Engineer. If the encountered grouting conditions indicate large voids or open pathways within the embankment, the Contractor may use a thicker mix to the satisfaction of the Engineer.

J. If a grout leak is observed during grouting operations, grouting shall be stopped temporarily and the grout allowed to set. Grouting shall be resumed within other zones along the grout pipe or within adjacent grout pipes.

3.04 BACKFILLING OF HOLES

A. No hole shall be backfilled until the injected grout has had sufficient time to set. After the grout has been allowed to set, each of the grout holes shall be backfilled with grout via a tremie pipe inserted to the bottom of the hole. The tremie pipe shall be removed and grout shall be filled flush with the embankment crest.

B. Upon satisfactory completion of the proposed grouting plan, as approved by the Engineer, the Contractor shall cut the grout pipes to 6-inches below the embankment crest.

3.05 CLEAN-UP

A. Remove and dispose of off-site spent, unused, and wasted grout materials associated with the center and right embankment grouting programs.

B. Grout that becomes hardened in topsoils shall be removed and replacement topsoil shall be imported, placed, and seeded. This work is considered incidental to the appropriate grouting bid item.

END OF SECTION

PART 1.00 GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary for finish grading and grass establishment, complete, including furnishing and delivery of material, fertilizing, seeding, and maintenance of grass. General Seed Mix as specified herein, shall be used for seeding slopes, crest, and all areas disturbed by construction.

1.02 SUBMITTALS

A. Provide certifications of performance for mulch products and analysis of proposed seed products that have been tested by a recognized laboratory for seed testing. Do not use seed that has become wet or moldy.

B. Provide moisture content test results for imported loam and normalize for 8% moisture content.

PART 2.00 PRODUCTS

2.01 LOAM BORROW

A. Loam Borrow may be available from stockpiles on the site from the Contractor's stripping. Prior to using stockpiled loam, contractor shall screen material to ensure it complies with required specifications. Reuse of onsite loam is subject to approval of the Owner's representative. If more loam borrow is needed than has been stockpiled, supply imported loam borrow at the Contractor's sole expense.

B. Loam Borrow shall consist of fertile, friable, natural topsoil typical of the locality, without admixture of subsoil, refuse or other foreign materials, and shall be obtained from a well-drained arable site. It shall be such a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter. ·

C. Prior to stripping, the loam shall have demonstrated by the occurrence upon it of healthy crops, grass or other vegetative growth that is reasonably well drained and that it does not contain toxic amounts of either acid or alkaline elements.

D. The loam shall contain not less than 4% nor more than 20% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230°F ±90.

E. Delivered loam shall be normalized to 8% moisture content.

2.02 pH CONTROL

A. The following amendments shall be included in soils where required by the soils analysis tests:

1. Soil sulfur.
2. Commercially packaged gypsum.
3. Ground dolomitic limestone.

2.03 LIME

A. Ground dolomitic limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes the 100-mesh sieve and 90 percent the 20-mesh sieve. Coarser material will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.

2.04 FERTILIZER

A. Commercial Fertilizer: A complete plant food containing 16 percent nitrogen, 6 percent available phosphoric acid, and 6 percent potash, conforming to applicable state fertilizer laws, availability of plant nutrients conforming to standards of the Association of Official Agricultural Chemist (AOAC), uniform in composition, dry free-flowing, and delivered in original, unopened containers bearing manufacturer's guaranteed analysis.

B. Superphosphate: Ammonium phosphate (16-20-0) containing 1.4 percent sulfur; granular, dry, free-flowing delivered in original bags.

2.05 TEXTURAL SOIL AMENDMENTS

A. Peat: A natural residue formed by decomposition of reeds, sedges, or mosses from fresh-water site, free from lumps, roots, and stones, absorbing at least four times its dry weight of water, organic matter not less than 90 percent on a dry weight basis. The maximum moisture content at time of delivery shall be 6% percent by weight.

B. Sand: Clean, coarse, well-graded material meeting all of the requirements of ASTM C33 for fine aggregate.

2.06 MULCH

A. Straw Mulch: Threshed straw of oats, wheat, or rye, free from seed of obnoxious weeds or clean salt hay.

2.07 NETTING

A. Jute Netting: Heavy, twisted jute netting, weighing 1 pound per square yard. Openings between strands of approximately 1-inch square.

2.08 SEED

A. General: Certified, blue tag, clean delivered in original, unopened packages and bearing an analysis of the contents, guaranteed 95 percent pure and to have a minimum germination rate of 85 percent within 1 year of test.

B. General Seed Mix: Slope Mix shall be used for any areas with a slope in excess of 5H:1V. Grassplots Mix shall be utilized in all other areas.

Grass seed shall be of the previous year's crop and in no case shall the weed seed content exceed 1 % by weight. The grass seed shall conform to the requirements of the following tables:

Germination Purity

	Proportion	Minimum	Minimum
For Grassplots & Islands			
Creeping Red Fescue	50%	85%	95%
Kentucky Blue	25%	85%	90%
Domestic Rye	10%	90%	98%
Red Top	10%	85%	92%
Ladino Clover	5%	85%	96%
For Slopes & Shoulders			
Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

The seed shall be furnished and delivered premixed in the proportions specified above. All seed shall comply with State and Federal seed laws. The seed mixture specified for slopes and shoulders consists of a tough hardy type for use on slopes graded at the rate of 4:1, and steeper slopes, and on shoulders adjacent to the roadway pavement or as otherwise directed. The mixture for grass plots is of a finer type which will produce finer turf. A manufacturer's Certificate of Compliance to the specifications shall be submitted by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.

C. Temporary Protective Seed: Annual rye grass applied at rate of 120 pounds/acre.

D. Inoculate: Pure culture of nitrogen-fixing bacteria prepared specifically for the legume species. A mixing medium as recommended by the manufacturer shall be used to bond the inoculate to the seed.

2.09 CHEMICAL SOILS TESTS

A. Submit samples of Subgrade Soil to the County or State Soil Testing Service for chemical analysis of soil after completion of rough grading to determine lime and/or super phosphate requirements.

B. Submit Loam Borrow for chemical analysis after incorporation of soil conditioners to determine lime and fertilizer requirements of County or State Soil Testing Service using samples taken from the top 4 inches of soil at 10 locations following standard soil sampling procedures. One copy of the fertilizer and liming recommendation report shall be submitted to the Engineer.

2.10 MECHANICAL SOILS TEST

A. Have mechanical analysis of topsoil performed by a soil analyst or Engineer to determine conformance to specified physical properties in accordance with AASHTO T 88-72, Mechanical Analysis of Soils.

PART 3.00 EXECUTION

3.01 SEEDING SCHEDULE

A. Within 20 calendar days of the date specified for commencement of seeding work, submit to the Engineer a proposed time schedule indicating dates for beginning and completion of the following operations:

1. Delivery of materials.
2. Preparation of seedbed.
3. Planting grass.
4. Maintenance.

3.02 CONSTRUCTION METHODS

A. Preparation of Subgrade: After rough grading is completed and before Loam Borrow is spread, apply lime and/or super phosphate as determined by chemical analysis, and thoroughly scarify ground to a minimum depth of 8 inches with a toothed ripping machine by running in two directions at right angles over the entire surface to be planted.

B. Spreading of Loam Borrow: Spread Loam Borrow and textural soil amendments over the prepared rough grade to provide a finished topsoil thickness as specified on plans. Use a rubber-tired tractor with grader blade or equivalent not weighing more than 3½ tons. Loam Borrow shall be spread to the required thickness at impacted bordering vegetated wetland (BVW) areas.

C. Disturbed areas within the embankment crest, slopes, staging area, roadways, and construction areas shall be top dressed as required to replace stripped material and grade to original elevations.

D. Liming and Fertilizing:

1. Apply lime and/or super phosphates uniformly at the rate determined from soil test.
2. Apply commercial fertilizer at the rate of 40 lbs per 1,000 sf distributing uniformly with a mechanical spreader, or at rate determined from soil test.

E. Finish Grading:

1. Thoroughly mix the applied materials to a depth of 8 inches by running a rototiller over the entire area in two directions at right angles.
2. Rake the topsoil area to a uniform grade so that all areas drain, as indicated on the final grading plan.
3. Lightly compact with a cultipacker before planting grass. Care shall be taken not to over compact or seal the surface of the topsoil.
4. Remove all trash and stones exceeding 2 inches in diameter from area to a depth of 2 inches prior to preparation and planting grass.

F. Reseeding Disturbed Areas:

1. All areas within the staging area and temporary roadways that have become completed due to stockpiled material or the movement of traffic across the site shall be scarified to a depth of 8 inches.
2. Finish grading shall be performed as described above.

G. Seeding:

1. Time of Seeding: Conduct seeding under favorable weather conditions during seasons which are normal for such work as specified in the RIDOT Standard Specifications.
2. Inoculating Seed: Inoculate shall be stored as recommended by the manufacturer and shall not be used later than the date indicated on the container or as otherwise specified. Inoculation of legumes shall be done within 48 hours before seeding.
3. Mechanical Seeding: Plant grass seed only when temperature and moisture conditions are suitable for work of this nature. Sow grassed areas evenly with a mechanical spreader at rate of 3 lbs per 1,000 sf, roll with cultipacker to cover seed, and water with fine spray. Method of seeding may be varied at

discretion of Contractor on his own responsibility to establish a smooth, uniformly grassed area.

4. Hydroseeding:

    a. Seeding shall be done within 10 days following soil preparation at rate of 3 pounds seed per 1,000 sf.
    b. Proceed with seeding operation on moist soil, but only after free surface water has drained away.
    c. Exercise due care to prevent drift and displacement of mixture into other areas.

5. Winter Protective Seeding: If seeding has not occurred by October 15, apply winter protective seed at a rate of 120 pounds per acre to all areas that are bare or incomplete. Remobilize to complete seeding in the spring.

H. Mulching and Protection:

1. Mulch all areas by spreading a uniform light cover of straw mulch over the seeded area at a rate of 2½ tons per acre not later than 2 days after seeding has been performed and tackify at a rate of 5 gallons per 1,000 sf.
2. Mulch all areas with a slope steeper than 20 percent, or in areas requested by the Owner's representative, as described and place jute netting or erosion control mats in strips paralleling the slope to completely cover newly seeded areas. Pin mulch to ground with 6-inch long wire staples at 5-foot intervals immediately after seeding.

3.03 MAINTENANCE

A. Maintenance Period: Begin maintenance immediately after each portion of grass is planted and continue for a minimum of 8 weeks after all lawn planting is completed or until final acceptance.

B. Maintenance Operations: Water to keep surface soil moist. Repair washed out areas by filling with Loam Borrow, liming, fertilizing, and seeding. Replace mulch on banks when washed or blown away. Mow frequently enough to keep grass from exceeding 6 inches. Weed by hand only after first planting season when grass is established.

3.04 GUARANTEE

A. If, at the end of the 8-week lawn maintenance period, a satisfactory stand of grass has not been produced (as determined by the Owner or Engineer), the Contractor shall renovate and reseed the grass or unsatisfactory portions thereof immediately, or, if after October 15, during the next planting season. If a satisfactory stand of grass develops by July 1 of the following year, it will be accepted. If it is not accepted, a complete replanting will be required during the planting season meeting all of the requirements specified under CONSTRUCTION METHODS.

B. A satisfactory stand is defined as grass or section of grass of 10,000 square feet or larger that has:

1. No bare spots larger than 3 square feet.
2. Not more than 10 percent of total area with bare spots larger than 1 square foot.
3. Not more than 15 percent of total area with bare spots larger than 6 inches square.

3.05 INSPECTION FOR ACCEPTANCE

A. Eight weeks after the start of maintenance on the last section of completed grass and on written notice from the Contractor, the Engineer will, within 15 days of such written notice, make an inspection to determine if

a satisfactory stand has been produced. If a satisfactory stand has not been established, another inspection will be made after written notice from the Contractor that the grass is ready for inspection following the next growing season. Final approval is subject to acceptance by the local conservation commission.

END OF SECTION

DIVISION 3 – CONCRETE

SECTION 03100
CONCRETE FORMWORK

RT 1.00 - GENERAL

1.01 DESCRIPTION

A. This section specifies requirements for concrete formwork to produce cast-in-place concrete structures as shown on the Drawings and as specified herein. The work shall consist of designing, furnishing, constructing and removing formwork for all cast-in-place concrete structures.

B. Use forms, wherever necessary, to confine the concrete and shape it to the required lines, and to provide the specified finish. Construct forms with sufficient strength to structurally support the work, and withstand the pressure resulting from placement and vibration of the concrete, and maintain forms rigidly in position. Construct forms sufficiently tight to prevent loss of mortar from the concrete.

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 117: Standard Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301: Standard Specification for Structural Concrete.
3. ACI 347: Guide to Formwork for Concrete.

B. Rhode Island State Building Code

1.03 QUALITY CONTROL

A. Provide in accordance with the requirements as specified.

B. Tolerances:

1. Permissible surface irregularities for the various classes of concrete surface finish as specified in Section 03300, Cast-in-Place Concrete, are defined as “finishes”, and are to be distinguished from tolerances as specified herein. Deviations from the established lines, grades, and dimensions will be permitted to the extent set forth herein.
2. The tolerance limits specified in this Section and the surface finish irregularities permitted in Section 03300, Cast-in-Place Concrete, are not the limits to which forms may be built or by which damaged from sheathing may be used. These limits are provided only for the occasional slight misalignment or irregularity of surface that may occur despite a serious effort to build and maintain the forms accurately and securely with an even surface. These limits will be allowed only for inadvertent or relatively infrequent irregularities of the degree mentioned, but practices and form materials will be prohibited which without doubt will result in the creation of additional irregularities, even though these would be within the limits specified.
3. Where specific tolerances are not stated herein or shown on the Drawings for a structure, portion of a structure, or other feature of the work, permissible deviations will be interpreted conforming to the tolerances stated herein for similar construction. Specific maximum or minimum tolerances as shown on the Drawings in connection with any dimension shall be considered as supplemental to the tolerances specified herein and shall govern. Concrete forms shall be set and maintained within the tolerance limits necessary to ensure that the completed work will be within the tolerances specified. Concrete construction that exceeds the tolerance limits specified or as shown on the Drawings shall be remedied or removed and replaced by the Contractor at no cost to the Owner.
4. Tolerances shall be as specified in ACI 117, Standard Specifications for Tolerances for Concrete and Materials.

1.04 DESIGN REQUIREMENTS

A. Design formwork to support vertical loads and lateral pressures resulting from placement and vibration of concrete in accordance with the requirements of ACI 301 and ACI 347, and as specified herein.

B. Camber the formwork to compensate for anticipated deflections due to the weight and pressure of the fresh concrete and due to construction loads.

C. Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations. Use wedges or jacks, individually or in combination for adjustment.

D. Design forms and falsework to include assumed values of live loads, dead load, weight of moving equipment operated on formwork, concrete mix, height of drop, vibrator frequency, ambient temperature, lateral stability, and other factors pertinent to the safety of the structure during construction.

E. Provide and design forms to conform with expansion and construction joint locations.

1.05 SUBMITTALS

A. Submittals for the following items shall be made in accordance with the requirements as specified.

B. Submit the following at least 30 days before the first concrete placement:

1. Manufacturer's data and installation instructions for proprietary form accessories, form coatings, pipe sleeves and seals, form ties and manufactured form systems if used.
2. Certification that form coatings comply with the requirements of this Section.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Forms for Exposed Finish Concrete: Construct formwork for exposed concrete surfaces with smooth faced undamaged plywood or metal, metal-framed plywood faced or other acceptable panel-type facing materials approved by Engineer, to provide continuous, straight, smooth as-cast surfaces, and produce a uniform and consistent texture and pattern on the surfaces. Metal patches on forms for these surfaces will not be permitted. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on the drawings.

1. Use overlaid plywood complying with U.S. Product PS-1 "A-C or B-B High Density Overlaid Concrete Form", Class I.
2. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Tubular Fiber Forms:

1. Provide forms with spirally constructed laminated plies of fiber.
2. Provide forms with wall thickness as recommended by the manufacturer to meet load requirements of the various uses and sizes.
3. Provide forms with wax coated outside surfaces for moisture resistance.
4. Provide forms with inside surface coated with bond-breaker compound.

D. Form Ties:

1. Form Ties: For concrete structures, which will not be in view or buried below finish grade, use carbon steel factory-fabricated, removable or stay in place snap-off type form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units, which will leave no metal closer than 1-1/2" to surface. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface. Patch all holes with non-shrink grout.
2. Form ties and spreaders for walls in areas exposed to view shall be Stainless Steel Cone–Tight Tyscru by Richmond Screw Anchor Co.; Dayton Sure-Grip and Shore Co.; or substitute approved by Engineer with Plastic cone-tight type cones having a 1" setback and a taper from 1" to 1-1/4". Tycone holes shall be sealed with plastic set back plugs, color as selected by Engineer from manufacturer's standard color selection or filled with non-shrink grout. Tyscru ties shall be sized to satisfy loading requirements.
3. In lieu of form ties specified above, fiberglass form tie systems shall be used. Fiberglass form ties shall be standard gray color. The concrete structure shall be finished by grinding the fiberglass form tie flush with the finish surface of the concrete structure.

E. Form Releasing Agents: Provide commercial formulation form-releasing agents that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. Volatile organic compound emissions of form coating agent shall not exceed 2.09 pounds per gallon (250 grams per liter).

F. Chamfer Strips: Provide ¾-inch triangular fillets to form all exposed concrete corners. Material shall be rubber or polyvinyl chloride type, or smooth clear, sealed softwood.

G. Sleeves: Sleeves for wall and floor penetrations shall be pre-engineered Century-Line sleeves as manufactured by Thunderline Corporation or Engineer approved substitute. Sleeves shall be constructed of high impact thermoplastic with waterstop collar, reinforcing ribs and nailer end caps for positioning forms. Sleeve shall be designed to work with modular mechanical seal for through wall penetrations. Size of sleeves shall be selected according to manufacturer's recommendations for pipe sizes indicated on drawings.

H. Seals: Sleeve/pipe seals shall be Link-Seal modular mechanical seals as manufactured by Thunderline Corporation or Engineer approved substitute. The seal shall be modular, mechanical; type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening. The elastomeric element shall be sized and selected per manufacturer's recommendations and have the following properties as designated by ASTM:

1. For standard service applications: (-40°F to 250°F) EPDM – ASTM D2000 M3 BA 510.
2. For hydrocarbon service applications: (-40°F to 210°F) Nitrile – ASTM D2000 M1BF510.
3. For high temperature or fire seal applications: (-60°F to 400°F) Silicone – ASTM D2000 M1GE505.

PART 3.00 - EXECUTION

3.01 INSPECTION

A. Examine the substrate and conditions under which work of this Section is to be performed, and correct unsatisfactory conditions, which would prevent proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 FORM CONSTRUCTION

A. General:

1. Construct forms as designed and in accordance with Contractor's approved working drawings conforming to ACI 347, to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and plumb work in finished structures.
2. Provide for openings, offsets, keyways, recesses, moldings, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features required. Use selected materials to obtain required finishes.
3. Forms for concrete which accommodate work of other trades, fabricated before the opportunity exists to verify the measurements of adjacent construction, shall be accurately sized and located as dimensioned on the Drawings. In the event that deviation from the Drawing dimensions results in problems in the field, the Contractor shall be responsible for resolution of the conditions as approved by the Engineer, at no cost to the Owner.

B. Fabrication:

1. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces.
2. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to temporary openings on forms in as many inconspicuous locations as possible, commensurate with design requirements. Form intersecting planes to provide true, clean cut corners.

C. Falsework:

1. Erect falsework and support, brace, and maintain it to safely support vertical, lateral, and asymmetrical loads applied until complete structure has attained design strength. Construct falsework so that adjustments can be made for take-up and settlement, and access is provided for inspection.
2. Provide wedges, jacks or chamfer strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to product work of required dimensions.

D. Forms for Exposed Concrete:

1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes
2. Provide sharp clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.
3. Use extra studs, walers, and bracing to prevent bowing of forms between studs and to avoid

bowed appearance in concrete. Do not use narrow strips of form material, which will produce bow.

E. Corner Treatment:

1. Unless shown otherwise, form chamfers with ¾-inch by ¾-inch strips, accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to require limit and miter chamfer strips at changes in direction.

F. Control Joints: Locate as indicated on the Drawings.

G. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Verify size and location of openings, recesses and sleeves with the trade requiring such items. Accurately place and securely support items to be built into forms.

H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove encrusted mortar and grout, chips, wood, sawdust, dirt, and other debris just before concrete is placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

3.03 FORM COATINGS

A. Coat form contact surfaces with form-releasing agent before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces that will be bonded to fresh concrete. Apply in strict compliance with manufacturer's instructions.

B. Remove surplus coating on form surfaces before placing concrete.

3.04 INSTALLATION OF EMBEDDED ITEMS

A. Set and build into the forms, anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.

B. Set edge forms or bulkheads and intermediate screed strips for slabs, to obtain required elevation and contours in the finished slab surface. Provide and secure units to support types of screeds required.

3.05 REMOVAL OF FORMS

A. Formwork not supporting concrete, such as sides of walls, columns, and similar parts of the Work, may be removed after cumulatively curing at not less than 50 degrees F for 72 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operation, and provided that curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as elevated beams, joists, slabs and other structural elements may not be removed until concrete has attained 70% of its design minimum 28-day compressive strength, and has cumulatively cured for no less than 7 days. Concrete shall have sufficient strength to safely support its own weight and construction live loads and lateral pressures. Determine potential compressive strength of in-place concrete testing field-cured specimens representative of the concrete location or members, as specified in Section 03300, Cast-in-Place Concrete.

C. Form facing material may be removed one day after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing

shores and supports.

D. Form ties: The concrete structure shall be finished by grinding the fiberglass form ties flush with the finish surface of the concrete structure.

3.06 REUSE OF FORMS

A. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. When forms are reused for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Apply new form releasing agent to all form areas that will be in contact with concrete.

B. Do not reuse forms if there is any evidence of surface wear and tear, splits, fraying, delamination or other damage which would impair the quality of the concrete surface or prevent obtaining the specified concrete finish.

END OF SECTION

SECTION 03200
REINFORCING STEEL

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Furnish and install all reinforcement and associated items required and/or indicated on the Drawings for all cast-in-place concrete.

1.02 REFERENCES

A. The latest editions of the following American Concrete Institute (ACI) publications shall be used as reference standards:

1. ACI SP-66 ACI Detailing Manual
2. ACI 301 Specifications for Structural Concrete for Buildings

B. The latest editions of the following American Society for Testing and Materials (ASTM) publications shall be used as reference standards:

1. A185: Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
2. A615: Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. A767: Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
4. A1094: Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement.

1.03 SUBMITTALS:

A. Submit the following:

1. Mill test reports for each shipment of reinforcement. Identify reports with specific lots in shipments and submit prior to use of reinforcement in work.
2. Chemical composition of reinforcing steel. Ladle analysis to identify percentage of carbon, phosphorous, manganese and sulfur present in steel.
3. Welder's certification in accordance with AWS D1.4 prior to welding, when welding is indicated or specified.
4. Shop and placement drawings to the Engineer for review prior to fabrication, which show:
   a. All construction and expansion joints.
   b. Reinforcement detailed in conformance with ACI SP-66.
   c. Support bars and details of bar supports including type, size and spacing.
   d. Marking for each reinforcement item.

1.04 QUALITY ASSURANCE:

A. Provide in accordance with the requirements of the Quality Control section and as specified.

B. Do not fabricate reinforcement until shop and placement drawings have been approved by the Engineer.

C. Tolerances: Tolerances shall be as specified in ACI 315R.

1.05 PRODUCT HANDLING:

A. Protection:

1. Use all means necessary to protect reinforcing steel before, during, and after installation and to protect the installed work and materials of all other trades.
2. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.
3. Use all necessary precautions to maintain identification after the bundles are broken.

B. Replacements:

1. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

PART 2.00 - PRODUCTS

2.01 REINFORCING MATERIALS

A. All reinforcing steel shall be newly rolled deformed bars, free from rust, and comply with ASTM A-615 or A706, grade 60.

1. Reinforcement bars shall be ASTM A767, Class 1, zinc coated or coated as per ASTM A1094 after fabrication and bending.
2. Bars to be welded shall conform to ASTM A706 deformed, Grade 60.
3. Provide mill bent reinforcing bars, bent cold to the dimensions indicated and conforming to the requirements of ACI SP-66.

B. Welded wire fabric shall conform to ASTM A 185, with a minimum ultimate tensile strength of 70,000 psi. Provide in sizes indicated. Provide support bars and reinforcing bar supports as specified to obtain the concrete cover. Galvanized welded wire fabric shall meet ASTM A185, plain, fabricated from galvanized-steel wire into flat sheets.

C. Bar support and accessories shall be galvanized or plastic coated and shall conform to ACI 315. Provide minimum size number 5 support bars.

D. Wire for tying uncoated reinforcement in place shall be No. 16 AWG or heavier black soft-annealed wire. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

2.02 OTHER MATERIALS:

A. All other materials, not specifically described but required for a complete and proper installation of reinforcing steel, shall be as selected by the Contractor subject to the approval of the Engineer.

2.03 FABRICATION:

B. Fabricate reinforcement only after shop drawings have been returned by the Engineer marked "Approved".

A. Provide reinforcing bars that have been cut and bent before shipment. If bars must be bent on site, bend reinforcing steel cold, and do not straighten or rebend in a manner, which will damage the material. Bend in conformance with requirements of ACI SP-66 or with ASTM A767 when reinforcement is to be galvanized.

B. Splices:

1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying for the full length of the splice. All lap splices shall be ACI 318, Class B, unless indicated otherwise on the Drawings.
2. Adjacent splices shall be staggered whenever possible.

PART 3.00 - EXECUTION

3.01 SURFACE CONDITIONS:

A. Inspection:

1. Prior to installation of the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that reinforcing steel may be installed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the original design.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 BENDING:

A. General:

1. Fabricate all reinforcement in strict accordance with the approved Shop Drawings.
2. Do not use bars with kinks or bends not shown on the Drawings or on the approved Shop Drawings.
3. Do not bend or straighten steel in a manner that will damage the material.

B. Design:

1. All bends shall be in accordance with ACI 318. Bend all bars cold.

3.03 PLACING:

A. General:

Before the start of concrete placement, accurately place all reinforcing steel, positively securing and supporting by concrete blocks, metal chairs or spacers, or by metal hangers.

B. Splicing:

1. Horizontal Bars:
   a. Place bars in horizontal members with minimum laps at splices sufficient to develop the strength of the bars in accordance with ACI 318.
   b. Bars may be wired together at laps except at points of support of the member, at which points preserve the clear space described above.
   c. Wherever possible, stagger the splices of adjacent bars.

2. Other Splices:

   Make only those other splices that are indicated on the approved Shop Drawings or specifically approved by the Engineer.

3. Dowels:

   Place all required steel dowels and securely anchor them into position before the concrete is placed. Dowels placed into existing concrete shall be securely anchored with high strength epoxy as indicated on the Drawings.

4. Obstructions:

   In the event conduits, piping, inserts, sleeves, or any other items interfere with placing reinforcement as indicated on the Drawings or as otherwise required, immediately consult the Engineer and obtain approval of new procedure before placing concrete.

5. Use precast concrete bar support blocks for foundation mats.

3.04 MINIMUM COVER

A. Unless otherwise shown, provide the following minimum cover:

Formed Concrete Exposed to Earth or Water	2” Minimum Cover
Cast Concrete Exposed to Earth	3” Minimum Cover

3.05 CLEANING AND TOUCH-UP OF REINFORCEMENT:

A. Steel reinforcement, at the time concrete is placed around it, shall be free from rust scale, loose mill scale, oil, paint, and all other coatings which will destroy or reduce the bond between steel and concrete.

B. After installation and prior to placing concrete or mortar, touch-up galvanized reinforcing with damaged or missing coatings. Galvanizing repair paint shall be SSPC-Paint 20; MIL-P-21035B; or engineer-approved equivalent with dry film containing a minimum of 94 percent zinc dust by weight.

3.06 ADHESIVE EPOXY ROCK ANCHOR INSTALLATION AND TESTING

A. Rock anchors using the two-component epoxy adhesive shall be installed per manufacture recommendations.

B. Rock anchors using the two-component epoxy adhesive shall be tested for pullout strength in accordance with SECTION 01400.

1. Gages used with the jack shall be calibrated as a single system. Calibration shall have occurred within 6 months of the date of the test.

2. The test will be considered a success if the anchor remains seated once the test load is applied.

3. The test loads are as follows:

a. Pullout: 20,000 pounds per anchor

END OF SECTION

PART 1.00 – GENERAL

1.01 SCOPE

A. Provide hydrophilic rubber or PVC waterstops as indicated and specified.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM) Publications:

1. D412: Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
2. D638: Test Method for Tensile Properties of Plastics
3. D624: Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
4. D1149: Test Method for Rubber Deterioration – Surface Ozone Cracking in a Chamber
5. D1203: Test Methods for Volatile Loss from Plastics Using Activated Carbon Methods
6. D2240: Test Method for Rubber Property – Durometer Hardness

B. Corps of Engineers: CRD-C 572-74

C. Bureau of Reclamation: C-902

1.03 SUBMITTALS

A. Shop Drawings: Submit the following as specified in Section 01340, Submittals.

1. Manufacturer's printed data and literature for all specified materials and locations where materials are to be used.
2. Manufacture's procedure for splicing sections of waterstops.

B. Samples of waterstops.

C. Certification that materials proposed for use are non-toxic and have no effect on the quality or appearance of potable water. Materials shall be NSF approved for contact with potable water.

1.04 QUALITY CONTROL.

A. Reject and replace waterstops that have become wet or exhibit swelling prior to concrete placement.

B. Require a manufacture's service representative to visit the job site before any waterstops are installed to demonstrate the correct installation and splicing procedures.

C. Correctly position waterstops in joints.

D. Provide waterstops in maximum practical lengths to minimize joints.

E. Use adhesives manufactured by or recommended by the waterstop manufacturer for attachment of the waterstop to concrete.

F. Waterstops shall be positioned to provide a minimum of 3" concrete cover. Provide increased

cover when recommended by the manufacturer.

G. Waterstops shall be positioned to provide a minimum of 1.5" separation from reinforcing steel. Provide increased separation when recommended by the manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING.

A. Transport, handle and deliver materials to the job site in the manufacturer's sealed bags, unopened containers or banded pallets.

B. Store materials off the ground on a platform or skids and protect with covers from snow, rain and ground splatter.

C. Store waterstops under cover in a dry cool location, out of direct sunlight. Hydrophilic waterstops shall be maintained in a dry condition until concrete placement

PART 2.00 - PRODUCTS

2.01 HYDROLPHILIC GASKET WATERSTOPS

A. Provide hydrophilic rubber gasket waterstops fabricated of non-vulcanized rubber, chloroprene rubber, urethane polymers, vinylester polymers or combinations of these materials.

B. Waterstops shall be of solid construction and 3/8" X 3/4" minimum in cross section.

C. Provide waterstops as recommended by manufacturer for specific installation.

D. Waterstops containing bentonite shall not be used.

E. Provide hydrophilic gasket waterstops that meet or exceed the criteria in Table 03256-1.

TABLE 03256-1

Property	Test Method	Limit
Ultimate Elongation	ASTM D 412	70% minimum
Tensile Strength	ASTM D 412	25 psi [170 kPa] minimum
Ozone Resistance	ASTM D 1149	No Failure
Volatile Loss	ASTM D 1203	0.50% maximum
Hardness, Shore A	ASTM D 2240	20 to 60
Tear Resistance	ASTM D 624	50 lb/inch
Expansion Ratio	Volumetric Change-Distilled water @70°F	3 to 1 min.

F. Provide hydrophilic rubber gasket waterstops as manufactured by:

1. No. CJ-1020-2K as manufactured by Greenstreak Plastic Products Company, St. Louis, MO;
2. Adeka Ultraseal MC-2010M manufactured by Adeka North America, Spearfish, SD;
3. Swellseal 8 manufactured by De Neef Construction Chemicals, Inc., Waller,TX;
4. or equal.

2.02 HYDROPHILIC PASTE WATERSTOPS

A. Provide hydrophilic rubber paste waterstops of urethane paste, thixotropic vinyl monomer or similar materials.

B. Hydrophilic rubber paste shall be compatible with waterstop material.

C. Hydrophilic paste shall be 100% solids.

D. Provide hydrophilic paste waterstops that meet or exceed the criteria in Table 03256-2.

TABLE 03256-2

Property	Test Method	Limit
Ultimate Elongation	ASTM D 412	50% minimum
Tensile Strength	ASTM D 412	25 psi [170 kPa] minimum
Ozone Resistance	ASTM D 1149	No Failure
Volatile Loss	ASTM D 1203	0.50% maximum
Hardness, Shore A	ASTM D 2240	20 to 60

E. Provide hydrophilic rubber paste as manufactured by:

1. Duroseal Paste manufactured by BBZ USA, Southington, CT;
2. Adeka Ultraseal P-201 manufactured by Adeka North America, Spearfish, SD;
3. Swellseal Cartridge manufactured by De Neef Construction Chemicals, Inc.,Waller, TX;
4. Or acceptable equivalent product.

2.03 PVC WATERSTOPS

A. Provide flexible, ribbed, center-bulb, PVC waterstop with the geometry and size indicated on the Drawings.

B. The PVC waterstop shall be extruded from an elastomeric plastic material of which the basin resin is prime virgin polyvinyl chloride.

C. The PVC compound shall not contain any scrapped or reclaimed material or pigment.

D. Provide PVC waterstop that meet or exceed the criteria in Table 03256-3.

TABLE 03256-3

Property	Test Method	Limit
Water absorption	ASTM D 570	0.15% max
Tear Resistance	ASTM D 624	200 lb/in (35kN/m) minimum
Ultimate Elongation	ASTM D 638	350% minimum
Tensile Strength	ASTM D 638	2000 psi [13.78 MPa] minimum
Low Temperature Brittleness	ASTM D 746	No Failure @-35°F (-37°C)

Stiffness in Flexure	ASTM D 747	600 psi (4.13 Mpa) min.
Specific Gravity	ASTM D 792	1.45 max
Hardness, Shore A	ASTM D 2240	79±3

E. Provide factory made waterstop fabrications for all changes of direction, intersection, and transitions leaving only straight butt joint splices for the field.

F. Provide hog rings or grommets spaced at 12 inches on center along the length of the waterstop.

G. Provide Teflon coated thermostatically controlled waterstop splicing irons for field butt splices.

PART 3.00 - EXECUTION

3.01 INSTALLATION GENERAL

A. Provide hydrophilic rubber gasket and paste waterstops where specifically indicated.

B. Center waterstops in joints unless otherwise indicated.

C. Consolidate concrete during placement in vicinity of waterstop without damaging or dislodging waterstop.

D. Clean joint surface of dirt, dust, debris and laitance immediately before applying waterstop and remove standing water.

E. Protect waterstops from moisture until concrete is placed. Waterstops that exhibit swelling prior to concrete placement shall be removed and replaced at the Contractor's expense.

3.02 HYDROPHILIC GASKET WATERSTOPS

A. Install hydrophilic gasket waterstops in continuous lengths to minimize joints. Provide waterstop in one continuous length as practicable. Butt ends at joints of waterstop or overlap a minimum of 2" or per manufacturer's instructions.

B. Seal joints in hydrophilic gasket waterstops with a hydrophilic rubber paste compound as recommended by the manufacturer.

C. Do not bend hydrophilic gasket waterstop. Cut square and butt joints at corners.

D. Waterstop shall be in continuous contact with the concrete surface.

E. Attach hydrophilic gasket waterstop to concrete surface with continuous bead of hydrophilic rubber paste or adhesive. Paste or adhesive shall be provided by or as recommended by the waterstop manufacturer.

F. Fix hydrophilic gasket waterstop to concrete surface with masonry or concrete nails or powder activated fasteners at a maximum 12-inch spacing.

G. Provide one fastener one inch from the top and a second fastener four inches from the top of vertical hydrophilic gasket waterstops regardless of which fastening method is used.

H. Do not compress or otherwise deform hydrophilic gasket waterstop when fastening to concrete.

I. Do not wrap hydrophilic gasket waterstops around pipes less than the minimum diameter recommended in the manufacture's printed instructions.

3.03 HYDROPHILIC PASTE WATERSTOPS

A. Clean dirt and debris from area to receive hydrophilic paste waterstop.

B. Bead of hydrophilic paste waterstop shall be a minimum of 1/4 thick by 1/2 inches wide.

C. Apply hydrophilic paste waterstop such that there is no break in the bead.

D. Install hydrophilic paste waterstops in accordance with the manufacture's printed instructions.

3.04 PVC WATERSTOPS

A. Field butt splices shall be heat fused welded using a Teflon covered thermostatically controlled waterstop splicing iron at approximately 380°F or as recommended by the manufacturer. Pre-manufactured 3- and 4-way connectors shall be utilized at connection/junction locations.

B. Lapping over overlaying of waterstops, use of adhesives or solvents shall not be allowed.

C. Center waterstop in joint and secure waterstop to correct position using hog rings or grommets spaced at 12 inches on center along the length of the water stop; wire tie to adjacent reinforcing steel. Nailing, stapling, or any other means of fastening PVC waterstops in place that creates a puncture in the waterstop is strictly prohibited.

D. Notch waterstops to fit around reinforcing steel so that the waterstop will remain vertical and unbent when reinforcing steel interferes with waterstop placement.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. The work covered under this Section includes, but is not limited to, the furnishing of all plant, labor, equipment, appliances and materials including all joint fillers and sealants, and performing all operations in connection with providing the construction of all Portland cement concrete in accordance with these specifications and in reasonably close conformity with the lines and grades shown.

1.02 QUALITY CONTROL

A. As the work progresses, the Contractor will be required to perform tests and/or engage a testing laboratory in order to confirm that the quality of the concrete will be in conformance with these Specifications. Concrete shall be sampled in accordance with Section 01400, QUALITY CONTROL/QUALITY ASSURANCE.

1. The independent testing laboratory onsite representative shall remain onsite throughout each concrete placement. Observing the contractors means and methods of concrete placement, including: transporting concrete (i.e. pumping or hopper methods), discharging, vibrating, and finishing.

B. Slump tests shall be made according to ASTM C143. Slump test shall be performed for each day's pour of each type of concrete; perform additional tests when concrete consistency seems to have changed. Tests shall be taken at the point of discharge and prior to placement. If the concrete has been modified after testing has commenced, a new sample shall be taken of the modified mix and testing redone at no additional cost to the owner. No slump in excess of 4 inches shall be permitted without written consent of the Engineer.

C. Air content of concrete made with normal-weight aggregates that have low absorption shall be tested according to either ASTM C231 or ASTM C173. Air content of concrete test shall be performed at a frequency of not less than one test per concrete truck of concrete placed. Tests shall be taken at the point of discharge and prior to placement. If the concrete has been modified after testing has commenced a new sample shall be taken of the modified mix and testing redone at no additional cost to the owner. No air content in excess of 6% +/-1.5% shall be permitted without written consent of the Engineer.

D. Concrete Temperature: Test hourly when air temperature is below 40°F, when above 80°F, and each time a set of compression test specimens, slump test, or air entrainment test are required.

E. Compression test specimens will be made by the Contractor and cured according to ASTM C31. Six specimens shall be collected for each 50 cubic yards of concrete placed or for each pour at a structure. Specimens shall be tested with one sample tested at 3 days, two samples tested at 7 days and two samples tested at 28 days and one specimen retained in reserve for a 56 day test if required. If both 28 day specimens achieve the required compression strength, the reserve specimen shall be broken at 28 days.

F. Compressive test specimens shall be tested according to ASTM C39.

G. If the concrete is found to be substandard as a result of the initial testing, then any additional work for replacement or removal of the substandard concrete or retesting shall be at the Contractor's expense.

H. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders,

evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

I. Strength levels of concrete will be considered satisfactory if averages of sets of three consecutive strength cylinders meet or exceed required strength and no individual strength test results fall below specified compressive strength by more than 500 psi.

J. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

K. Additional Tests: The Contractor's Independent testing service shall make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed by the Engineer.

1.03 SUBMITTALS

A. Submit the following:

1. Batch plant details giving the location, layout, capacity, and type of batch plant and the method of transporting concrete from the batch plant to the work location. Contractor shall provide documentation that all requirements of local authorities and regulations have been met.

2. Notification to the Engineer of concrete deliveries, a minimum of 24 hours in advance of the scheduled delivery. Include within this notification, class and quantity of concrete, frequency of trucks, and ordered slump.

3. Description of methods for cold-weather and hot weather batching, mixing and delivery.

4. Concrete Mix Designs:

i. Submit concrete mix designs to the Engineer within a minimum of 30 calendar days prior to placement. Include a complete list of materials including admixtures, applicable reference specifications, and copies of test reports showing the mix has been successfully tested to produce the properties specified.

ii. For each design mix

a. Certifications by the concrete supplier that ingredients conform to the specified requirements.

b. Certifications by the concrete supplier that design mix conforms to specified strength, unit weight, maximum size aggregate, air entrainment, slump and to be free of soluble chloride content.

c. Coarse aggregate gradation, specific gravity, and dry rodded unit weight.

d. Identify admixtures, and planned dosage rate.

5. Compression test results.

a. Test results will be reported in writing to the Engineer within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name and location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7 day tests and 28 day tests.

1.04 DELIVERY, STORAGE AND HANDLING

A. Order concrete from batching plant so that trucks arrive at discharge locations when concrete is required. Avoid excessive mixing of concrete or delays in placing successive layers of concrete in forms.

B. Deliver concrete to discharge locations in watertight agitator or mixer trucks without altering the water-cement ratio, slump, air entrainment, temperature and homogeneity. Addition of water will not be permitted once the concrete has left the batch plant, unless approved in writing by the Engineer of Record.

C. Concrete not conforming to specification, unsuitable for placement, exceeding the time or temperature limitations or not having a complete delivery batch ticket will be rejected.

1.05 JOBSITE CONDITIONS

A. Weather: Protect concrete from damage and reduced strength or performance due to weather extremes during mixing, placing and curing.

B. Cold Weather: Unless special precautions are taken to protect concrete, do not work if temperatures are below 40°F or when temperatures are expected to fall below 40°F within 72 hours after placing concrete.

1. Comply with ACI 306 in cold weather.
2. Maintain concrete temperature of at least 60°F. Reinforcement, forms and ground in contact with concrete shall be free of frost.
3. Maintain a temperature of at least 50°F, for reinforcement, forms and ground in contact with concrete prior to placement.
4. Keep concrete and formwork at least 50°F for at least 96 hours after placing concrete.
5. The use of calcium chloride in any form is not permitted. Non-chloride accelerator shall be used when ambient temperature is below 50°F.
6. Admixture manufacturer shall provide technical assistance at no additional cost. A manufacturer's representative shall be available for consultation by phone of on-site upon 72-hour notice.

C. Hot Weather: Concrete, when deposited, shall be less than 85°F. Cool the mix in a manner acceptable to the Engineer if the concrete temperature is higher.

1. Comply with ACI 305 in hot weather.
2. Retarder shall be used when ambient temperature exceeds 80°F.

PART 2.00 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type II for all work unless otherwise specified. Use one brand of cement throughout project.

B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Use ¾" maximum size for all concrete, unless otherwise directed or specified. Provide aggregates from a single source for exposed concrete.

C. Water: Clean, potable and free from foreign materials in amounts harmful to concrete and embedded steel. Provide water which meets ACI/ASTM requirements for concrete mix water.

D. Fly Ash: ASTM C618, Type F

1. Fly ash shall be used in concrete designated as "Mass Concrete" as a cementitious replacement for Portland cement at ratio of 1:1, up to 25% but no less than 15% by weight, unless noted otherwise.
2. Fly ash type F shall be from one production source throughout the work and shall meet or exceed the requirement of ASTM C618, Type F, Tables No. 1 and No. 2. The source shall be in conformance with U.S. Army Corps of Engineers Pre-qualification requirements.
3. The concrete supplier shall furnish a notarized certificate from the fly ash supplier at the time of submittal of concrete mix designs indicating conformance with these requirements specified. Also, a copy of the most recent chemical analysis shall be provided.
4. Fly ash shall be considered as a part of the cementitious material when calculating water cement ratio.

E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

1. Products: Subject to compliance with requirements, products, which may be incorporated in the work, include the following
   a. "Air-Mix"; Euclid Chemical Co.
   b. "Sika Aer"; Sika Corp.
   c. "MB-VR or MB-AE"; Master Builders
   d. "Darex AEA" or "Daravair"; W.R. Grace
   e. Or equal.

F. Water Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1% chloride ions. Follow manufacturer's recommendations for amount of admixture to be added to the concrete. Admixture shall be compatible with air-entraining admixtures.

   a. "WRDA Hycol"; W. R. Grace.
   b. "Eucon WR-75"; Euclid Chemical Co.
   c. "Pozzolith Normal"' Master Builders.
   d. "Plastocrete 160"; Sika Chemical Corp.
   e. Or equal.

G. High-Range Water Reducing Admixture (SuperPlasticizer): ASTM C 494, Type F or Type G and containing not more than 0.1% chloride ions. Follow manufacturer's recommendations.

1. Products: Subject to compliance with requirements, products which may be incorporated in the work include the following:

a. "WRDA 10" or "Daracem"; W. R. Grace.
b. "PSP"; Protex Industries Inc.
c. "Super P"; Anit-Hydro.
d. "Sikament"; Sika Chemical Corp.
e. "Rheobuild"; Master Builders.
f. Or equal.

H. Water Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E or C, and containing not more than 0.1% chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:
a. "Accelguard 80"; Euclid Chemical Co.
b. "Pozzutec 20"; Master Builders, Inc.
c. "PolarSet"; Grace Construction Products.
d. Or equal.

I. Water Reducing, Retarding Admixture: ASTM C 494 Type D, and containing not more than 0.1% chloride ions.

1. Products: Subject to compliance with requirements, products that may be incorporated in the work include the following:
a. "Edoco 20006"; Edoco Technical Products.
b. "Pozzolith Retarder"; Master Builders.
c. "Eucon Retarder 75"; Euclid Chemical Co.
d. "Daratard"; W. R. Grace.
e. "Plastiment"; Sika Chemical Co.
f. Or equal.

J. Prohibited Admixtures: Calcium chloride thyocyanates or admixtures containing more than 0.1% chloride ions are not permitted.

2.02 RELATED MATERIALS

A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. Per sq. yd., complying with AASHTO M 182, Class 2.

B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

C. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
a. "Masterseal"; Master Builders.
b. "A-H 3 Way Sealer"; Anti-Hydro Waterproofing Co.

c. "Ecocure"; Euclid Chemical Co.
d. "Clear Seal": A.C. Horn, Inc.
e. "Sealco 309"; Gifford-Hill/American Admixtures.
f. "J-20 Acrylic Cure"; Dayton Superior.

D. Underlayment Compound: Free flowing, self-leveling, pumpable cementitious base compound.

1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
a. "Ardex K-15"; Ardex Engineered Cements.
b. "Silflo 200"; Silpro Masonry Systems.
c. "Ultra/lPlan"; Mapei.

E. Bonding Compound: Polyvinyl acetate or acrylic base.

1. Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
a. Acrylic or Styrene Butadiene:
ii. "J-40 Bonding Agent"; Dayton Superior Corp.
iii. "Everbond"; L & M Construction Chemicals.
iv. "Hornweld"; A. C. Horn, Inc.
v. "Daraweld C"; W. R. Grace.

2.03 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

B. Submit written reports for review of design mix for specified strength of concrete within 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed.

C. Strength: Provide concrete having the following minimum compressive strength at 28 days:

1. Class 5000 psi –3/4": Use in all concrete, unless otherwise specified.

D. The concrete quality, mixing and placing shall conform to ACI-318, Chapter 5.

E. Design mixes to provide normal weight concrete with the following properties, as indicated:

Design Compressive Strength,	Minimum Strength fc 7 days	Laboratory Testing Age 28 day	Minimum ** Cement Lbs./cu.yd.	Maximum* W/C Ratio
5,000 psi	3,500 psi	5,000 psi	705	0.40

*Maximum: Decrease if possible
**Minimum: Increase as necessary to meet all other stated requirements.

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by the Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Engineer before using in work.

G. Admixtures

1. Use water-reducing admixture or high range water reducing admixture (super plasticizer) in all concrete in strict accordance with the manufacturer's printed instructions.
2. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of ±1.5%.

H. Consistency:

1. The consistency shall be uniformly maintained within the allowable range of slump for the job materials. Ordinarily the slump shall not be less than 1-1/2 nor more than 3 inches, unless in the opinion of the Engineer, job conditions warrant exceeding these limits. The consistency shall be determined by the AASHTO Method T-119. This range of slump is to be maintained for all concrete including pumped concrete.
2. Concrete containing HRWR admixture (super-plasticizer): Not more than 7" after addition of HRWR to site-verified 1-1/2" to 3" slump concrete.

2.04 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water after the concrete has been batched will not be permitted, unless approved in writing by the Engineer of Record.
1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required. When air temperature is between 85°F (30° C) and 90°F (32° C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.
2. During cold weather heat water, sand and cement materials per recommendations of ACI 306.

PART 3.00 - EXECUTION

3.01 FORMWORK

A. All formwork shall be completed as provided for within Section 03100.

B. Forms shall conform to shapes, lines and dimensions of the members as called for on the Drawings and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape.

C. Forms shall be removed in such a manner as to ensure the complete safety of the structure. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to support their weight and imposed loads safely.

3.02 INSTALLATION

A. Batch, mix and deliver Portland cement concrete in conformance with ASTM 94. Batch all constituents at central batching or mixing plant. Produce concrete in conformance with ACI 301 and as specified.

B. Seasonal Conditions:

1. Conform to ACI 305R and as specified for hot weather concreting. Do not add retarder admixture to any concrete.
2. Conform to ACI 306R and as specified for cold weather concreting. Do not add accelerator admixture to any concrete.

3.03 INSTALLATION OF EMBEDDED ITEMS

A. Set and build into work, anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

B. Clean embedded items of oil, ice, dirt and all other foreign items.

C. For embedded pipes, complete all necessary testing requirements prior to placing concrete.

3.04 PLACING CONCRETE

A. General:

1. Prior to placing concrete against rock, the rock surface shall be cleared of loose rock and cleaned and washed of all loose soil, organic matter or other deleterious materials such that competent rock surface is exposed. The cleaned rock surface shall be inspected by the Engineer prior to the Contractor placing concrete against the rock. Backfill or concrete placed against the surface of rock without prior inspection by the Engineer shall be subject to removal and replacement at the discretion of the Engineer at no additional cost to the Owner.
2. Concrete shall not be placed when the Engineer is not present.
3. Do not place concrete until the depth, character and adequacy of forms, falsework, embedments, and the placing of the steel reinforcement have been approved by the Engineer.

The method and manner of placing the concrete shall be such as to avoid segregation of aggregate and displacement of the reinforcement. Non-aluminum troughs, pipes and round bottom chutes may be used as aids in placing concrete when necessary. Dropping the concrete a distance of more than five feet, or depositing a large quantity at one point and moving concrete over an extended distance with mechanical vibrators, will not be permitted. Concrete shall be placed upon clean, damp surfaces, free from running water, or upon properly consolidated soil.

4. Before placement, all equipment for mixing and transporting the concrete shall be cleaned, and all debris and ice shall be removed from the places to be occupied by the concrete. Forms shall be thoroughly wetted (except in freezing weather) or oiled. The reinforcement shall be thoroughly cleaned of ice, dirt, rust scale or other deleterious coatings.
5. Retempering of concrete by adding water or any other material shall not be permitted.
6. Concrete placement, finishing and curing, and all other pertinent construction practices shall be in accordance with ACI 117 and ACI 301. In addition to the requirements of ACI 117 and ACI 301, the following shall apply:
   a. When placing is started, it shall be carried on as a continuous operation until placement is completed.
   b. Concrete shall be placed so that a uniform appearance of surfaces will be obtained.
   c. Concrete shall be placed and consolidated free of rock pockets, honeycombs, and voids.
   d. Concrete shall be deposited as nearly as practicable in its final position, to avoid segregation due to rehandling or flowing, and shall not be subjected to any procedure that will cause segregation.
   e. Concrete shall be placed and consolidated in walls in approximately 18-inch layers, proceeding at a uniform rate or per the form designer's recommendation.
   f. Do not add water to concrete during delivery, at the Project site, or during placement, unless approved by the Engineer of Record in writing. Amount of water to be added (if permitted by Engineer of Record) at the project site shall be indicated on the mix design and batch tickets submitted by the contractor. Water shall be added prior to on-site testing of the concrete mix.
   g. Before placing concrete, and if agreed upon by the Engineer of Record, water may be added at the Project site, subject to the limitations of ACI 301.
   h. Do not add water to concrete after adding high-range water-reducing admixtures.
7. Prepare top and sides of existing walls to remain in accordance with Section 3.03E. Engineer shall be notified at least 48 hours in advance of pouring new concrete on existing to observe prepared surface.

B. Consolidating:

1. Consolidate concrete with suitable mechanical vibrators operating within concrete. When necessary, vibrating shall be supplemented by hand spading with suitable tools to assure proper and adequate consolidation. Vibrators shall be manipulated so as to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The vibration at any joint shall be of sufficient duration to accomplish consolidation but shall not be prolonged to the point where segregation occurs.
2. Employ as many vibrators and tampers as necessary to secure the desired results. For every two vibrators required for the job, an additional standby vibrator shall be kept on the site. Do not place subsequent layers of concrete until the previous layer has been consolidated as specified. Internal vibrators shall have a minimum frequency of 8000 vibrations per minute when immersed in concrete and shall have sufficient amplitude to effectively consolidate the concrete.

3. Prevent the following practices:
   a. Pushing of concrete with vibrator.
   b. External vibration of forms.
   c. Allowing vibrator to vibrate against reinforcing steel where steel projects into green concrete.
   d. Allowing vibrator to vibrate against the contact faces of forms.

C. Cold Weather: Do not place concrete when the ambient temperature is below 40°F, unless specifically authorized by the Engineer. Conform to the requirements of ACI 306R during cold weather.

D. Hot Weather: Do not place concrete with a mix temperature exceeding 90°F, unless specifically authorized by the Engineer. Conform to the requirements of ACI 305R during hot weather.

E. Construction Joints:

1. When the placing of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, such provisions shall be made for grooves, steps, keys, dovetails, reinforcing bars or other devices as may be prescribed. Before depositing new concrete against existing concrete or concrete which has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly (approximately ¼-inch) amplitude), wetted, and covered with a neat coating of cement paste or grout. Install joint sealant where shown on the Drawings, in accordance with manufacturer's instructions.
2. Joints shall be perpendicular to the main reinforcement.

F. Defective Work:

1. All defective work disclosed after the forms have been removed shall be immediately removed and replaced. If dimensions are deficient, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Engineer cannot be repaired satisfactorily, the entire section shall be removed and replaced at no cost to the Owner.
2. Other work considered to be defective includes, but is not limited to, the following:
   a. Concrete in which defective or inadequate steel reinforcement has been placed.
   b. Concrete incorrectly formed, or not conforming to details and dimensions on the Drawings or with the intent of these documents, or the concrete surfaces of which are out of plumb or level beyond specified tolerances.
   c. Concrete below specified strength.
   d. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the Drawings.

3.05 CONCRETE FINISHING

A. In general, concrete exposed to view shall be surfaces shall be true, smooth, and free from open or rough spaces, depressions, projections, and burs, and have a rubbed finish. Tie holes and areas of honeycombing shall be filled with a non-shrink grout. Concrete permanently hidden from view shall have had burs removed and tie holes and honeycombs filled with a non-shrink grout. The concrete in horizontal plane surfaces shall be brought flush with the finished top surface at the proper elevation and shall be struck off with a straight-edge and floated. Mortar finishing will not be permitted, nor

shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.

B. The following requirements shall govern concrete finishes so indicated on the Drawings.

1. Rubbed Finish: After forms have been removed, bug holes shall be filled with a low water-cement-ratio paste. Paste shall then be rubbed over the wall using a brush or sponge application to provide the desired finish.
2. Float Finish: Force coarse aggregate away from surface; float to a smooth and even surface.
3. Trowel Finish:
   a. After floating, begin the first trowel finish operation using a power-driven trowel; begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.
   b. Consolidate the concrete surface by the final hand troweling operation, free from trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8" in 10'-0" when tested with a 10'-0" straight–edge
4. Broom Finish:
   a. Apply nonslip broom finish to exterior concrete as specified, immediately after trowel finishing; roughen the concrete surface by brooming in the direction perpendicular to the main traffic route.
      i. Use a fiber bristle broom.
      ii. Frequently clean broom to avoid deep brooming.
4. As-Cast Finish:
   a. Rough form finish; tie holes and defects shall be patched.
      i. Fins exceeding ¼ Inch in height shall be chipped off or rubbed off.
      ii. Otherwise, surfaces shall be left with the texture imparted by the forms.
   b. Smooth form finish: the form facing material shall produce a smooth, hard, uniform texture on concrete.
      i. The arrangement of the facing material shall be orderly and symmetrical, and the number of seams kept to the practical minimum.
      ii. Forms shall be supported by studs or other backing capable of preventing excessive deflection.
      iii. Form-facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

3.06 CURING AND PROTECTION

A. Initial Curing: All concrete shall be properly cured and protected in accordance with ACI 308. Maintain concrete above 50 degrees Fahrenheit during first seven days after placing. The work shall be protected from the elements, flowing water, and from defacement of any nature, during construction. The concrete shall be cured as soon as it has sufficiently hardened, by covering with an approved material. Water-absorptive coverings shall be thoroughly saturated when placed, and kept saturated for a period of at least seven days. Curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to air currents. Where wooden forms are used, they shall be kept wet at all times until removed, to prevent the opening of joints and drying out of the concrete. Membrane curing compounds shall be coordinated with the surface to be painted, covered with plaster, covered with sealer, and other surfaces which curing compound would adversely affect subsequent construction.

B. Duration of Curing – Structural Concrete: The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50°F, has totaled 7 days beyond the initial curing period.

1. Rapid drying at the end of the curing period shall be prevented.

C. Duration of Curing – Non-Structural Concrete: The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50°F, has totaled 3 days beyond the initial curing period.

1. Rapid drying at the end of the curing period shall be prevented.
2. Covering of non-structural concrete shall not occur until a minimum of 3 days has elapsed from the time of the pour.

D. Formed Surfaces: Steel forms heated by the sun and all wood forms in contact with the concrete during the curing period shall be kept wet.

1. If forms are to be removed during the curing period, one of the specified curing materials or methods shall be employed immediately.
2. Such curing shall be continued for the remainder of the curing period.

3.07 CONCRETE SURFACE REPAIRS

A. General: Any defective work disclosed after removal of forms shall be immediately removed and replaced. If in the opinion of the Engineer, the surface of the concrete cannot be repaired satisfactorily, the entire section shall be removed and replaced at no additional expense to the Owner.

B. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the Engineer.

1. Cut out honeycomb, rock pockets, voids over 1” in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case, to a depth of less than 1”. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brushcoat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

C. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

D. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of the Engineer. Surface defects, as such, include color and texture irregularities, bulges, uneven surfaces, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

E. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

F. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.

G. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least ¾" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

H. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

I. Perform structural repairs with prior approval of the Engineer for method and procedure, using specified epoxy adhesive and mortar.

J. Repair methods not specified above may be used, subject to acceptance of the Engineer.

END OF SECTION

SECTION 03600
GROUT

PART 1.00 - GENERAL

1.01 SCOPE

A. This section specifies the requirements of all grout related work. Unless otherwise specified, all grouting shall be done with non-shrinking grout.

B. This section also specifies furnishing and installing two component epoxy systems for grouting of anchor bolts, threaded rod anchors, and reinforcing bars to be installed in hardened concrete and masonry.

1.02 SUBMITTALS

A. Submit Certificate of Compliance of products with these specifications.

1. Manufacturer's printed data and literature for all specified materials and locations where materials are to be used.
2. Manufacturer's installation/application instructions.

1.03 QUALITY

A. Ensure surfaces to be grouted are clean and sound and are not feathered at edges.

B. Observe safety precautions as outlined in the manufacturer's literature and as printed on containers and labels.

PART 2.00 - PRODUCTS

2.01 NONSHRINKING GROUT

A. Non-shrinking grout shall be furnished factory premixed so that only water is added at the jobsite. Grout shall be mixed in a mechanical mixer. No more water shall be used than is necessary to produce a flowable grout.

B. Provide non-shrink, non-metallic cement-based grout requiring only addition of water with a minimum 28-day compressive strength of 6000 psi.

C. Provide shrinkage and compensation characteristics in both the plastic and hardened states, conforming to ASTM C-1107, Grade C.

D. Grout shall exhibit small but predictable amount of expansion sufficient to counteract the normal shrinkage of cement. The expansion shall occur after initial set to insure maximum contact between grout and base plates, beams, masonry, or other surfaces.

E. Acceptable products:

1. "Five Star Grout" by U.S. Grout Corp
2. "Sika Grout 212" as manufactured by Sika Corporation.
3. "Masterflow 928" Grout by Master Builders, Inc.
4. Or approved equal.
5. Grout for slide gate frames shall be provided in accordance to the gate manufacturer's recommendations.

2.02 EPOXY ADHESIVE FOR REINFORCING BARS

A. Epoxy bonding/grouting adhesive shall be a multi-purpose 2 component, 100% solids, moisture tolerant structural epoxy adhesive conforming to the current ASTM C881 specifications.

B. Acceptable products:

1. "Concressive 1490" as manufactured by Master Builders, Inc.
2. "Sikadur 32, Hi Mod" by Sika Corporation
3. "Resi-Bond (J-58)" by Danton Superior
4. As stated on the drawings
5. Or approved equal.

2.03 EPOXY ADHESIVE FOR ANCHORS

A. Slide Gate

1. Adhesives for slide gate anchors shall be provided in accordance to the gate manufacturer's recommendations.

B. Miscellaneous Concrete and Rock Anchors

1. Epoxy bonding/grouting adhesive shall be a multi-purpose 2 component, 100% solids, moisture tolerant structural epoxy adhesive conforming to the current ASTM C881 specifications.
2. Acceptable products:

a. "HIT-RE 500 Epoxy Adhesive" as manufactured by Hilti.
b. Or approved equal.

PART 3.00 – EXECUTION

3.01 NONSHRINKING GROUT

A. Preparation

1. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles and disintegrated materials by mechanical abrasion methods such as sandblasting. Sandblast structural and reinforcing steel to remove loose material and expose sound metal.
2. Construct appropriate sturdy forms to contain grout at the fluidity level at which it will be used.

B. Placement

1. Unless otherwise specified or indicated on the drawings, grout between metal members and hardened concrete shall be 1-1/2 inches thick.
2. Grout shall be placed in strict accordance with the directions of the manufacturer so that all spaces and cavities are completely filled, without voids.
3. Forms shall be provided where structural components will not confine the grout.
4. Place grout only from one side to avoid entrapping air. Provide adequate air vent holes in large areas. Work or flow into place, filling all cavities.

5. Reinforce grout pads or applications three inches or more in thickness with wire mesh or reinforce bars.
6. Excessive means of vibration may cause segregation of aggregates and will not be permitted.

C. Edge Finishing

1. In all locations where the edge of the grout will be exposed to view, the grout shall be finished smooth after it has reached its initial set. Except where shown to be finished on a slope, the edges of grout shall be cut off flush at the baseplate, bedplate, member, or piece of equipment.

D. Curing

1. Non-shrinking grout shall be protected against rapid loss of moisture by covering with wet cloths or polyethylene sheets. After edge finishing is completed, the grout shall be wet cured for at least 3 days and then an acceptable membrane curing compound shall be applied.

3.02 EPOXY ADHESIVES.

Epoxy Adhesive shall consist of a two-component liquid epoxy adhesive of viscosity appropriate to the location and application, and an inert aggregate filler component, if recommended by the adhesive manufacturer. Components shall be packaged separately at the factory and shall be mixed immediately before use. Proportioning and mixing of the components shall be done in accordance with the manufacturer's recommendations.

A. Preparation

1. Where indicated on the drawings, anchor bolts, threaded rod anchors, and reinforcing bars shall be epoxy grouted in holes drilled into hardened concrete. Diameters of holes shall be as follows:

Item	Diameter of Hole
Reinforcing Bars and Threaded Rod Anchors	1/8 inch larger than the outside diameter of the bar or the rod
Headed Anchor Bolts	Bolt diameter plus 2 inches

2. The embedment depth for epoxy grouted anchor bolts, threaded rod anchors, and reinforcing bars shall be at least 15 bolt, rod, or bar diameters, unless otherwise indicated on the drawings.
3. Holes shall be prepared for grouting as recommended by the grout manufacturer.

B. Installation

1. Anchor bolts, threaded rod anchors, and reinforcing bars shall be clean, dry, and free of grease and other foreign matter when installed.
2. The bolts, rods, and bars shall be set and positioned and the epoxy grout shall be placed and finished in accordance with the recommendations of the grout manufacturer.
3. Care shall be taken to ensure that all spaces and cavities are filled with epoxy grout, without voids.
4. During assembly of all threaded stainless steel components, anti-seize thread lubricant shall be liberally applied to the threaded portion not embedded in concrete.

END OF SECTION

DIVISION 4 – MASONRY

SECTION 04860
STONE MASONRY REPAIR

PART 1 - GENERAL

1.01 SCOPE

A. This section specifies the requirements of all dry set stone masonry related work. Unless otherwise specified, all reconstruction of stone masonry walls shall be completed without mortar.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For stone varieties proposed for use on Project, include test data indicating compliance with physical properties required by referenced ASTM standards.

B. Samples for Verification:

1. For each stone type indicated. Include at least two samples in each set for each type of stone, exhibiting extremes of the full range of color and other visual characteristics expected in completed Work.
2. For each color of mortar required provide 1 sample. Label Samples to indicate types and amounts of pigments used.

C. List of Materials Used: List generic product names together with manufacturers, manufacturers' product names, sources of supply, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.

1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of the Engineer and approved in writing.

D. Qualification Data: For qualified Installer.

1.03 QUALITY

A. Installer Qualifications: A qualified installer who employs experienced stonemasons and stone fitters.

B. Source Limitations for Stone: Obtain **each variety of** stone, from one quarry with resources to provide materials of consistent quality in appearance and physical properties.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

DELIVERY, STORAGE, AND HANDLING

A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

C. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.05 PROJECT CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.

B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone masonry.

1. Protect base of walls from mortar splatter by coverings spread on the ground and over the wall surface.
2. Protect sills, ledges, and projections from mortar droppings.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40° F (4° C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.06 COORDINATION

A. Advise installers of other work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone masonry.

PART 2 - PRODUCTS

2.01 QUARTZ-BASED STONE <

A. Quartz-Based Stone: Comply with ASTM C 616, Classification III Quartzite.

1. Products: Subject to compliance with requirements

B. Match samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.02 OTHER STONE

A. Provide sound natural stone as follows:

1. Products: Subject to compliance with requirements, Retain appropriate subparagraphs below and insert values based on test data for acceptable stone varieties, or delete all for proprietary specification. Absorption and compressive strength are often indicative of ability to resist freezing and thawing.

2. Maximum Absorption per ASTM C 97: 3 percent.
3. Minimum Compressive Strength per ASTM C 170: 7500 psi (52 MPa).

B. Match samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.03 MORTAR MATERIALS

A. Coordinate requirements in this article with those in Section 02520.

B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

C. Hydrated Lime: ASTM C 207, Type S.

D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or III, and hydrated lime complying with ASTM C 207.

E. Mortar Cement: Comply with ASTM C 1329.

F. Masonry Cement: Comply with ASTM C 91.

G. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in stone masonry mortar.

H. Aggregate: ASTM C 144 and as follows:

I. Use potable water for all cement and mortar mixing

2.04MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride.
2. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
4. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one

to two hours. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Mortar for Stone Masonry: Comply with ASTM C 270

1. Mortar for Setting Stone: Type M.
2. Mortar for Pointing Stone: Type N

2.05 FABRICATION

A. Fabricate stone to comply with sizes, shapes, and tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.

1. For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite."

B. Select stone to produce pieces of thickness, size, and shape similar to that of the existing stone on site. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated.

C. Cut and drill sinkages and holes in stone for anchors and supports.

D. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units before shipment.

E. Shape stone for type of masonry (pattern) as follows:
1. Split-bed, random-range ashlar with random course heights and random lengths (interrupted coursed).

F. Finish exposed faces and edges of stone to comply with requirements indicated for finish and to match existing stone finishes on-site.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.03 SETTING OF STONE MASONRY, GENERAL

B. Perform necessary field cutting and trimming as stone is set.

1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.
2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.
3. Pitch face at field-split edges as needed to match stones that are not field split.

C. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

D. Arrange stones in Split-bed, random-range ashlar with random course heights and random lengths (interrupted coursed).

E. Set stone to comply with requirements indicated on Drawings. Install supports, fasteners, and other attachments necessary to secure stone masonry in place. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

F. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than3/8 inch at narrowest points or more than 2-1/2 inches.

3.04CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet or more.

B. For external corners, do not exceed 1/4 inch in 20 feet.

END OF SECTION

SECTION 04921
STONE MASONRY REPOINTING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Work included in this item consists of utilizing a combination of hand tools, high pressure and ultra-high pressure water, to remove existing deteriorated and loose mortar. Once fully cleaned, all cleaned joints of the stone masonry walls above and below water shall be re-pointed as indicated on the Drawings, specified herein and as directed by the Engineer.

B. Portions of the walls may be underwater during the work. Use of experienced divers and proper dive procedures, installation of temporary cofferdams, or otherwise dewatering the work area may be required.

1.02 SUBMITTALS

A. The Contractor shall submit the removal and repointing procedures to be utilized during the progression of the work for underwater and above water cleaning and repointing at least 10 days prior to implementation.

B. The Contractor shall submit the mortar mix design(s) at least 10 days prior to implementation. Include a complete list of materials including admixtures, applicable reference specifications, and copies of test reports showing the mix has been successfully tested to produce the properties specified.

1.03 STORAGE AND HANDLING

A. Store and handle all mortar and materials per manufacturer's recommendations.

PART 2 – PRODUCTS

2.01 GENERAL

A. The Masonry joint repointing material shall be as stated or an approved equal.

1. Above Water
    a. For use in applications less than 3 inches: Five Star Structural Concrete V/O, Tamms Speedcrete Redline, or an approved equal.
    b. For use in applications greater than 3 inches: Tamms Aqualseal Gel, EpoxySystems Product #707, or an approved equal.
2. Below Water
    a. For use in applications less than 3 inches: Tamms Speedcrete Blueline, CC Chemical Duracrete Underwater Grade, Five Star Structural Concrete Underwater HP, or an approved equal.
    b. For use in applications greater than 3 inches: Tamms Aqualseal Gel, EpoxySystems Product #707, or an approved equal.

B. Mortar shall be non-toxic and approved for use in potable water.

C. Mortar utilized above normal pool shall be color and texture matched to the existing mortar within the training wall faces.

PART 3 – EXECUTION

3.01 GENERAL

A. All construction shall be completed by divers/masons experienced in repairing brick masonry structures below water.

B. All mortared joints shall match adjacent masonry in appearance and thickness.

C. Pointing of above water-mortared joints shall not be performed if the temperature falls below 40 ºF or if the masonry shows signs of frost.

3.02 REMOVING EXISTING MORTAR AND CLEANING OF MASONRY JOINTS

A. All loose and deteriorated mortar shall be removed from the existing granite block walls as indicated on the Drawings and described herein.

B. Mortar shall be removed by using a combination of hand tools, high-and ultra-high pressure water as required to clean joints of loose or unsound mortar and all other loose or deleterious coatings. Cleaning shall be in such a manner as to not damage the surrounding granite blocks or sound mortar. Mechanical tools shall be used only after approval by the Engineer.

C. All loose and deteriorated mortar shall be removed to a depth of at least ¾-inch. Any loose material shall be removed from the joint by use of compressed air or high pressure water, as approved by the engineer.

D. All cleaning and removal of mortar shall be performed immediately prior to repointing of the joint.

3.03 INSPECTION

A. The Contractor shall accommodate inspections performed by the Owner following removal of deteriorated mortar and cleaning of the joints.

B. The Contractor shall provide the Owner with 3 days notice prior to repointing any portion of the wall in order to allow for the Owner's inspection of joints.

C. The Contractor shall provide complete all cleaning of stone masonry joints concurrently to be inspected one time only. Additional inspection required will be at the Contractor's expense.

D. Owner shall undertake inspections within 1 day of final cleaning.

3.04 REPOINTING

A. All joints shall be cleaned of accumulated sediment immediately prior to repointing.

B. All repointing and placement of new mortar shall be performed immediately following the removal of existing mortar and cleaning of the masonry and subsequent approval by Engineer.

C. All pointing shall be performed in at least two operations. The first operation shall point to within ¾" of the surface. The final operation shall point to the surface of the joint.

1. For joints less than 3 inches in depth, approved material for use in such applications shall be placed in accordance with the manufacturers recommendations to within ¾" of the surface.
2. For joints greater than 3 inches in depth, approved material for use in such applications, shall be placed in accordance with the manufacturers recommendations to within ¾" of the surface
3. Final ¾" of repointing shall be completed in accordance with the manufactures recommendations, utilizing an approved pointing tool to produce a slightly concave finish. Final repointing shall be performed continuously across the joint to produce a uniform line. Where cold joints occur between sections proper lapping shall be utilized to ensure adequate adhesion.

D. Placement of mortar above the water shall be performed by manual means as approved by the Engineer and per the manufacturer's recommendations. After placement, all mortar shall be protected from sunlight and kept wet for a period of at least seventy-two hours.

E. All voids shall be completely filled and sealed with new mortar. Use of backer rod and wire shall not be permitted.

F. All joints shall be finished with a pointing tool approved by the Owner.

G. Pointing shall be completed from the bottom upward, one course at a time.

3.05 CLEANING EXPOSED FACES

A. The face of the masonry is to be left in a clean condition, free of mortar/concrete stains and any other material that may detract from the appearance of the work. The Contractor will employ a method of cleaning the face of the masonry that will not cause damage to the work. The Contractor shall submit its preferred method of cleaning to the Owner for approval.

3.06 DISPOSAL

A. The Contractor shall remove and dispose of all deteriorated and removed mortar.

END OF SECTION

DIVISION 5 – METALS

SECTION 05250
MISCELLANEOUS METALS AND HARDWARE

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to install the miscellaneous metal accessories and miscellaneous hardware specified herein, or indicated on the drawings.

B. Work shall include, but not be limited to the timber footbridge structure, railing hardware, and access hatches.

1.02 QUALITY ASSURANCE

A. Workmanship and Finish

1. Metalwork shall be fabricated in shops having experience with similar work and in accordance with the highest standards for the respective type of work.
2. Exposed surfaces shall be smooth finish with well defined lines.
3. All work shall be true to details, well formed to shape and size and fabricated with proper joints, shape lines and angles, and all curved work sprung evenly to curves.
4. All necessary appurtenances shall be provided to assemble the work at the shop as complete as possible.
5. Holes for bolts and screws shall be drilled and fastenings concealed where practicable.
6. Complete shop drawings of all metalwork items will be required for review and approval by the Owner prior to fabrication of the units.
7. All shop work shall be delivered to the site complete and ready for erection.
8. Work shall be fabricated and installed in a manner that will provide for expansion and contraction, prevent the shearing of bolts, screws and other fastenings, ensure rigidity and provide close fitting of sections.
9. Welding shall conform to the requirements of the American Welding Society and shall be done in a manner that will prevent permanent buckling, and all welds exposed in the finished work shall be ground smooth.
10. Proper care shall be exercised in handling all work so as not to injure the finished surfaces.
11. The Contractor shall provide all anchors, bolts and appurtenant items necessary for the complete erection of all work. All fasteners shall be hot-dipped galvanized.

B. Submissions

The Contractor shall submit to the Owner for approval completely detailed and certified shop and erection drawings of all metalwork. Necessary load and design calculations of all materials shall be submitted for the Owner's use in approving shop drawings. The shop drawings shall show the alloy, tempers and the finish of all metalwork.

C. Checking

The Contractor shall be responsible for checking the general arrangements, details and dimensions of the miscellaneous metalwork shown on the drawings and/or the approved shop drawings and for checking the details and dimensions of the structure to ensure the proper and satisfactory fitting of the metalwork into the construction.

PART 2.00 - PRODUCTS

2.01 ROLLED SECTIONS, STEEL PRODUCTS & ACCESSORIES

A. For structural members and footbridge hardware:

1. Steel Plates, Shapes, and Bars: ASTM A36/A36M
2. Steel Bolts and Nuts: Regular hexagon-headed bolts, ASTM A325, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
3. Welding Materials: AWS D1.1; type required for ferrous materials being welded
4. All steel shall be galvanized.

B. For access hatches:

1. All materials shall be 316 stainless steel.

PART 3.00 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to installation of the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Discrepancies:

1. In the event of discrepancy, the Contractor shall immediately notify the Owner.
2. The Contractor and fabricators shall not proceed with fabrication or installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 FABRICATION:

A. General
The Contractor shall install all work of this section in strict accordance with the approved Shop Drawings and the referenced standards.

3.03 WELDING:

A. General:

1. For details of joints, comply with requirements for AWS joints accepted without qualification tests.
2. Follow applicable sections of AWS specifications.

B. Types of Welds:

Unless otherwise noted:

All fillet welds shall be 5/16 inch minimum depth.

3.04 PAINTING:

A. All field welding shall be touched up with galvanizing paint prior to acceptance by the Engineer.

B. All painting shall be per the manufacturers recommendation.

C. All surfaces shall be primed, painted and coated as specified.

D. Drying time shall be per manufacturers recommendations.

END OF SECTION

SECTION 05520
PIPE AND TUBE RAILINGS

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall furnish all labor, materials, equipment and incidentals required to install the galvanized steel pipe and/or tube railings specified herein, or indicated on the drawings.

B. Work shall include, but not be limited to; installation of railings along the top of retaining walls.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SUMMARY

A. Section Includes:

1. Galvanized steel pipe and tube railings.

B. Related Sections:

1. 03300 Cast-In-Place Concrete

1.04 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Galvanized Steel: 72 percent of minimum yield strength.
2. Stainless Steel: 60 percent of minimum yield strength.

C. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

D. Delete both paragraphs below if only interior railings are required.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

F. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.05 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For products involving selection of color, texture, or design.

D. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

a. Show method of connecting members at intersections.

E. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Qualification Data: For qualified professional engineer.

G. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

H. Welding certificates.

1.06 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2.00 - PRODUCTS

2.01 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.02 GALVANIZED STEEL

A. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for all exterior installations and where indicated.

C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.03 FASTENERS

A. General: Provide the following:

1. Galvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 , Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Railing shall be embedded and grouted into the pile cap as indicated in the drawings.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Railings that are connected by tightening nuts shall be secured per manufacture recommendations. Tightening nuts shall be secured such that they are not subject to tampering or loosening by

vibration.

2.04 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For stainless-steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.05 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with either welded or non-welded connections.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Subparagraph below is an alternative to concealed mechanical fasteners and fittings.
2. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form changes in direction as follows:

1. By bending or by inserting prefabricated elbow fittings.

K. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.06 FINISHES GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.07 GALVANIZED STEEL FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize steel and iron railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning”.

1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Railings Indicated to Receive Primers Specified in Division 09 Section "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

E. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

F. Shop-Painting of Galvanized Steel:

1. Galvanized Surfaces: Galvanized steel work under this section shall be shop painted at the galvanizers plan with high-performance epoxy primer and polyurethane top coat.

a. Primer: Within 21 hours after the galvanizing process has been completed all exposed to view hot-dip galvanized steel shall be thoroughly cleaned, pretreated for positive paint adhesion, and then given one coat of galvanizing processor’s performance-guaranteed polyamide-epoxy primer.

b. Polyurethane Top Coat: Top coat applied over epoxy primer coat shall be Acrylic Polyurethane Enamel equal to Duncan “Colorgalve” system. Dry film thickness shall be 1.5-2.5 mils.

2. Color: Shall be subject to Engineer’s Approval.

PART 3.00 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.02 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.03 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

D. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

E. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For stainless-steel pipe railings, weld flanges to post and bolt to supporting surfaces.
2. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.04 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.

C. Attach railings to wall with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.05 ADJUSTING AND CLEANING

A. Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.06 ADJUSTING AND CLEANING

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION

DIVISION 6 – TIMBER

SECTION 06125
TIMBER DECKING AND RAILING

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. Timber decking and railing for the construction of the proposed timber footbridge as shown on the Drawings.

1.01 REFERENCES

A. American Lumber Standards Committee (ALSC)

1. Softwood Lumber Standards.

B. American Society for Testing and Materials (ASTM)

1. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
2. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
3. A307 - Carbon Steel Bolts, Studs, and Threaded Rod

C. American Wood Preservers Association (AWPA)

1. UC3B Exterior Constriction Above Ground Uncoated or poor water runoff
2. M4 - Care of Pressure Treated Wood Products.

D. National Forest Products Association (NFPA)

1. National Design Specification for Wood Construction.

1.02 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Contractor to provide technical data on wood preservative materials and application instructions. In lieu of grade stamping, Contractor to submit manufacturer's certificate that products meet or exceed specified requirements.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Lumber Grading Rules: NFPA.

B. Lumber Decking and Railing: Southern Yellow Pine Grade No. 1 Dry (MC19) or better, S4S.

1. Decking shall be S4S.

2.02 RELATED MATERIALS

A. Fasteners: Carbon Steel ASTM A307 and galvanized in accordance with ASTM A123 and A153 for exterior and treated wood locations, as shown on Contract Drawings.

2.03 FABRICATION

A. Contractor to verify dimensions and site conditions prior to fabrication.

B. All timber cut or drilled in any manner on-site shall receive penetrating sealer in accordance with AITC requirements.

C. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

2.04 WOOD TREATMENT

A. All timber, except oak, shall have pressure treatment in conformance with AWPA M4 and P5 Ammoniacal copper Quaternary (ACQ) in accordance with AWPA UC3B. Decking and timber railing shall have minimum retention of 0.25 pounds per cubic foot. The presence of the AWPB quality mark MLP shall be accepted as evidence of conformance to this specification.

B. All timber shall be supplied at a maximum moisture content of 19%.

C. Cut or drilled surfaces of all timbers shall be treated with a minimum of two saturating coats of copper naphthenate preservative (min. 2% metallic copper) in accordance with AWPA M4 and P5.

PART 3.00 – EXECUTION

3.1 INSPECTION

A. Contractor to verify that surfaces are level and ready to receive decking.

B. Contractor to verify that lumber is dry (MC19) prior to installation.

3.2 INSTALLATION

A. Decking lumber will be placed to the dimensions indicated by the Drawings.

B. Install decking with heartwood down, using 6-inch long deck spikes (2 per intersection). Deck planks shall be spaced 1/4-inch using dry timber.

3.3 SITE APPLIED WOOD TREATMENT

A. Site-sawn ends of timber shall have preservative treatment applied in accordance with manufacturer's instructions. Preservative shall be allowed to cure prior to erecting members.

END OF SECTION

SECTION 06130
TIMBER FRAMING

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. The work under this Section shall include the installation of new timber stringers, and other timber members associated with timber pier. timber members excluded from this section are members associated with timber decking and railing.

B. Related Sections: Documents affecting the work in this section include, but are not necessarily limited to, the General Instructions and applicable portions of the following specifications:

Section 06125 TIMBER DECKING AND RAILING

1.01 REFERENCES

A. American Lumber Standards Committee (ALSC)

1. Softwood Lumber Standards.

B. American Society for Testing and Materials (ASTM)

1. D245 – Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber
2. D255 – Standard Practice for Establishing Clear Wood Strength Values
3. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Product
4. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. A307 - Carbon Steel Bolts, Studs, and Threaded Rod

C. American Wood Preservers Association (AWPA)

1. UC4A Ground Contact or Fresh Water Non-critical components
2. M4 – Care of Pressure Treated Wood Products

D. National Forest Products Association (NFPA)

1. National Design Specification for Wood Construction.

E. American National Standards Institute/American Welding Society

1. D1.1 – Structural Welding Code

F. National Forest Products Association (NFPA)

1. National Design Specification for Wood Construction

G. American Wood Preservers Bureau (AWPB)

1. MLP - Standard for Softwood Lumber, Timber, and Plywood Pressure Treated for Marine (Saltwater) Exposure

H. American Institute of Timber Construction (AITC)

1.02 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Contractor to provide technical data on wood preservative materials and application instructions. In lieu of grade stamping, Contractor to submit manufacturer's certificate that products meet or exceed specified requirements.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Lumber Grading Rules: NFPA, RIS, SPIB, SFPA, WCLIB and WWPA.

B. Lumber Pile Caps, Stringers, Bracing, and other timber members: Southern Yellow Pine Grade No. 1 Dry (MC19) or better, S4S.

C. Timber shall have pressure treatment in conformance with AWPA M4 and P5 Alkaline Copper Quaternary (ACQ) in accordance with AWPA UC4A. Cross bracing shall have a minimum retention of 0.4 pounds per cubic foot, and pile caps and stringers shall have a minimum retention of 0.4 pounds per cubic foot. The presence of the AWPA quality mark MLP shall be accepted as evidence of conformance to this specification.

D. All timber shall be supplied at a maximum moisture content of 19%.

E. Cut or drilled surfaces of all timbers shall be treated with a minimum of two saturating coats of copper naphthenate preservative (min. 2% metallic copper) in accordance with AWPA M4 and P5.

2.02 ACCESSORIES

A. Connectors: Gusset Plates and Hurricane Straps.

B. Bolts, Nuts, Washers, Lags, Screws, and Drift Pins: Medium carbon steel with galvanized coating. Size and type to suit application in conformance with ASTM A153.

C. Washers shall be round steel plate, 3" minimum O.D. and 1/4" minimum thickness, galvanized.

D. Galvanizing: All hardware and plates shall be hot-dipped galvanized after fabrication and threading of stock, in accordance with ASTM-A153.

2.03 FABRICATION

A. Fabricate components in accordance with AITC. Joints shall be neatly fitted, welded, and ground smooth.

2.04 FINISHES

A. Galvanized connectors in accordance with ANSI/ASTM A123 and A153

2.05 STORAGE

A. Wood products delivered at the site shall be carefully piled, off the ground, in such a manner as to assure proper drainage, ventilation, and protection from the weather.

1. All lumber and timber shall be stored under dry conditions.

2. Care of pressure treated wood products shall comply with AWPA Standard M4.

B. Hardware and fasteners shall be stored in their original containers and under dry conditions until ready for use.

2.06 DECKING AND RAILING

A. Decking and railing shall be in accordance with Section 06125 TIMBER DECKING AND RAILING.

2.07 STANDPIPE STANCHION

A. Contractor to install standpipe stanchion and PVC dry line as indicated on the Drawings.

PART 3 EXECUTION

3.01 ERECTION

A. Set structural members level and plumb, in correct position as indicated on the Drawings.

B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Holes for machine bolts shall be bored with a bit 1/16" larger than the bolt diameter, and holes for drift bolts shall be 1/16" smaller than the bolt diameter as approved by the Engineer.

D. Drilled holes shall be thoroughly flushed with preservative. Similarly, cut timber surfaces shall be given two brush coats of preservative before installation, in accordance with AWPA M4.

E. All bolts shall bear on round plate washers under the nut and the head.

F. After nuts have been tightened, there shall be at least ½-inch, but not more than 2-inches, of exposed thread beyond the nuts.

G. After erection, touch-up galvanized surfaces with primer consistent with shop coat.

H. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing structural timber to itself, or to in-place construction.

I. Cutting, Fitting, and Placement: Perform cutting, drilling and fitting required for installation of structural timber. Provide temporary bracing as required. For items required to fit previously

constructed spaces, take measurements at job and fabricate to fit actual spaces. Repair cut surface with preservative brushed on to dry surface as recommended by the manufacturer.

J. Fit exposed connections accurately together to form tight joints. Cut exposed joints smooth and repair cut surfaces. Do not cut or abrade the surfaces of items which have been hot-dip galvanized.

K. Fastening of one member to another shall be accomplished in such a manner that no cracking or splitting of timber members shall occur. Cracked or split members shall be replaced by the Contractor, to the approval of the Engineer, at no additional cost to the Owner.

3.02 DEMOLITION AND COORDINATION

A. Demolition and legal disposal of existing and/or waste timber members and hardware shall be in accordance with Sections 02100 – DEMOLITION AND REMOVAL.

B. Coordinate pier pile, pile caps, stringers, rails, and decking work so that no undue stresses are placed on individual members during pier installation.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15000
MECHANICAL EQUIPMENT

PART 1.00 GENERAL

1.01 DESCRIPTION:

A. Scope: Contractor shall furnish all labor, equipment and incidentals required to design, deliver, install, and field test the Aluminum slide gates complete and operational with all appurtenances as shown on the Drawings and specified herein.

B. Four slide gates are to be provided as part of this project:

1. The low-level outlet gates (inclusive of 2 gates) are non-self-contained systems and are to be installed on the concrete face of the upstream and downstream walls of the low-level outlet chamber:
   a. The gates and hardware are to be installed face-mounted on the inside face of the upstream wall of the concrete riser. One gate will have an unseating head, the other a seating head, as indicated on the Drawings.
   b. Gate installation shall be in accordance with manufacturer's recommendations.
   c. Max Design Head: 20 feet (unseating/unseating)
   d. Operators shall have a nut operator to be operated with a T-handle wrench.
   e. Invert to Operator Floor: 16.5 feet (El. 83.5 to El. 100.0)

C. The sluiceway gates, consisting of a lift gate and a leaf gate, are a self-contained system to be installed within the stone masonry sluiceway channel, downstream of the timber footbridge.
   a. These gates are to share a common frame with a central support.
   b. The gate and hardware are to be installed wall-mounted.
   c. Gate installation shall be in accordance with manufacturer's recommendations.
   d. Max Design Head: 20 feet (unseating/unseating)
   e. Operators shall have a nut operator to be operated with a T-handle wrench.
   f. Invert to Operator Floor: 9.08 feet (El. 91.0+/- to be verified in field to El. 100.08)
   g. In the closed position the top elevation of the gates shall be 96.1 feet.
   h. In the fully open position the bottom of the gates shall be Elevation 99.0 feet

D. The gates and appurtenances shall be supplied in accordance with the latest edition of AWWA C561 as modified herein. The allowable leakage rate for the Aluminum slide gates in this specification shall be in accordance with the allowable leakage listed in the latest revision of American Water Work Association C561.

E. Coordination: Review installation procedures under Sections and other Contracts and coordinate the work, which is related to this Section.

F. Related Work Specified Elsewhere:

1. Section 05250 – MISCELLANEOUS METALS AND HARDWARE.

G. Contractor shall verify all dimensions prior to fabricating, ordering, and installation of the gate components.

H. The specification is based on the 800 Series Aluminum Gate as manufactured by Whipps, Inc. of Athol, Massachusetts. Including this particular model, any manufacturer's names and/or model numbers identified herein are intended to assist in establishing a general level of quality, configuration, functionality, and appearance required. This is NOT a proprietary specification and it should be noted

that "Or approved equal" applies to all products denoted herein. It is understood that all manufactures will have minor variations in configuration, appearance, and product specifications and such minor variations shall not eliminate such manufacturers as an “approved equal". It is the intent of this specification to encourage open and competitive involvement from multiple manufacturers that are able to supply similar products.

1.02 WORK INCLUDED

A. This specification relates to the design, materials of construction, fabrication, and supply of the aluminum slide gates as shown on the plans.

B. Gate: The work includes the installation of the new gates, frames, stems, mounting hardware, and manual operators. The gates are configured for manual operation via removable hand cranks.

1.03 QUALITY ASSURANCE

A. Qualifications: All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 10 years’ experience designing and manufacturing water control gates. The manufacturer shall have manufactured water control gates for a minimum of 100 projects.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. ASTM A276, stainless and heat-resisting steel bars and shapes.
2. ASTM B209, aluminum sheet and plate.
3. ASTM B221 and B308, aluminum extruded shapes.
4. ASTM B584, copper alloy and sand castings for general application.
5. ASTM D4020, U.H.M.W. polyethylene molding and extrusion material.
6. ASTM D2000, standard classification system for rubber products in automotive applications.
7. ASTM B26, aluminum alloy sand castings.

1.04 SUBMITTALS

A. Shop Drawings and Product Data:

1. Comply with the general notes of the Contract Drawings, where applicable.
2. Submit Shop Drawings showing the following:
   i. Complete description in sufficient detail to permit item by item comparison with the Specifications.
   j. Dimensions.
   k. Weights.
   l. Capacity.
   m. Maximum support reactions.
   n. Performance characteristics.
   o. Layout drawing for all equipment showing installation details.
   p. Deviations from Drawings and Specifications.
   q. Manufacturer’s installation and testing instructions.
   r. Affidavits of compliance with referenced standard and codes.
   s. Manufacturer’s standard guarantee.

B. Operation and Maintenance Manuals:

1. Required Operation Data:
   a. Complete, detailed operating instructions for each piece of equipment.
   b. Explanations of all safety considerations relating to operation.
2. Required Maintenance Data:
   a. Include all information and instructions required to keep equipment properly lubricated and adjusted so that it functions economically throughout its full design life.
   b. Explanation with illustrations as necessary for each maintenance task.
   c. Recommended spare parts list.
   d. Recommended schedule of maintenance tasks.
   e. Lubrication charts and table of alternate lubricants.
   f. Troubleshooting instructions.
   g. List of special maintenance tools and equipment.
   h. Name, address and phone number of manufacturer and manufacture's local service.
   i. Include copies of all approved Shop Drawings.

1.05 GUARANTEE

A. Comply with the requirements of General Conditions of Construction Contracts.

B. Contractor shall warrantee all system components for a period of 2 years after project completion.

PART 2.00 PRODUCTS

2.01 ALUMINUM SLIDE AND LEAF GATES

A. General:
1. Gate Assembly:
   a. Type: Self-contained gate with manual hand crank operators, unless otherwise specified.
   b. Leakage not to exceed AWWA C561 Standard latest edition during normal loading conditions. During usual loading conditions (seating head), shop tested leakage shall not exceed 0.025 gpm per foot of seal. Field leakage shall not exceed 0.05 gpm per each foot of seal perimeter.
   c. All structural components of the frame and slide shall be fabricated of aluminum having a minimum thickness of 1/4-inch and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.
   d. Gates shall be designed such that the water pressure provides a "seating head" unless otherwise approved by the Engineer.
   e. The gate shall utilize self-adjusting seals. A gate that utilizes adjustable wedges , wedging devices or J-seals, P-seals are not acceptable.
   f. All welds shall be performed by welders with American Welding Society certification.
2. Actuators:
   a. Gate shall be upward rising gate.
   b. Manual operating effort shall not exceed 40 lbs. when opening or closing the gate at maximum head.
3. Materials:

Components	Materials
Frame Guides, Yoke and Invert Member	6061-T6 Aluminum
Slide and Stiffeners	6061-T6 Aluminum
Stem	Stainless Steel, Type 304, ASTM A276

Anchor Studs, Fasteners and Nuts	Stainless Steel, Type 316, ASTM A276
Invert Seal	Neoprene ASTM D-2000 or EPDM
Seat/Seal and Facing	Ultra-High Molecular Weight Polyethylene ASTM D4020
Lift Nuts	Bronze ASTM B584
Pedestal	6061-T6 Aluminum or Stainless, Type 304L, ASTM A-276
Operator Housing	Cast aluminum or ductile iron

B. FRAME

1. The frame guides, invert member and yoke members shall be constructed of extruded aluminum shapes with a minimum thickness of 1/4-inch.
   a. Frame design shall allow for embedded side mounting or side mounting directly to a wall with stainless steel anchor bolts and grout. Mounting style shall be as shown on the Contract Drawings.
   b. The frame guides shall have a minimum weight of 4 lbs per foot of length for wall mounted and 3 lbs per foot for embedded or in-channel mounted.
   c. The frame guides shall extend to accommodate the entire height of the slide when the slide is in the fully opened position on upward opening slide gates or downward opening weir gates.
   d. A rigid extruded aluminum invert member shall be provided across the bottom of the opening. The invert member shall be of the flush-bottom type on upward opening gates and shall have a minimum weight of 4 lbs per foot of length for wall mounted and 3 lbs per foot for embedded or in-channel mounted.
   e. Self-contained frames shall be provided with a support yoke for mounting the actuator.
      i. The support yoke shall consist of structural members welded or bolted to the extended guide members.
      ii. The support yoke shall be located as required to provide full travel of the slide unless otherwise specified.
      iii. The yoke shall be designed so that the maximum deflection is limited to 1-360th of the span when operating at maximum specified head.
      iv. For gates with powered actuators, the yoke shall be designed to limit the maximum yoke stress to 7500 PSI at operator stall.
   f. Frames which are attached with epoxy anchor bolts shall be provided with bolts conforming with ICBO report 4285 regarding number of bolts, size, and placement.
   g. The stainless steel center support beam shall be designed and provided by the gate manufacturer.
   h. Frames shall be in one piece, consisting of left and right guide, invert member and header member, all welded together for one piece framed construction and shipped with gate leaf in frame. Gate frames bolted together for field assembly will not be acceptable.
   i. All support framework shall be stamped by a professional engineer registered in the State of Rhode Island.

C. SEALS:

1. Each gate shall be provided with a self-adjusting seal system to restrict leakage on all three sides of the gate in accordance with the requirements listed in this specification.
   a. Each gate shall be equipped with UHMW polyethylene seat/seals to restrict leakage and to prevent metal to metal contact between the frame and slide.
   b. The seat/seals shall extend to accommodate the 1-1/2 x the height of the slide when the slide is in the fully closed or fully opened position.

c. All upward opening gates shall be provided with a replaceable, resilient seal to seal the bottom portion of the gate. The seal shall be attached to the invert member of the frame or the bottom of the slide.
d. All seals shall be attached to the frame with in a dovetail slot.
e. The seal system shall be durable and shall be designed to accommodate high velocities and frequent cycling without loosening or suffering damage.
f. The seals shall be mounted so as not to obstruct the water way opening.
g. Gates that utilize rubber "J" seals or "P" seals are not acceptable.

D. SLIDE

1. The slide and reinforcing stiffeners shall be constructed of aluminum plate with a minimum thickness of 1/4-inch.
   a. The slide shall limit the maximum deflection to less than 1/360 of the span or 1/16 inch, whichever is smaller, and limit the maximum stress to 7500 PSI, under the maximum design head.
   b. The portion of the slide that engages the frame shall have a minimum material thickness of 1/2-inch.
   c. Reinforcing stiffeners shall be welded to the slide and mounted horizontally. Two vertical stiffeners shall be welded on the outside of the horizontal stiffeners for additional reinforcement.
   d. The stem connector shall be constructed of two angles or plates. The stem connector shall be welded to the slide. A minimum of two bolts shall connect the stem to the stem connector.

E. STEMS:

1. A threaded RISING operating stem shall be utilized to connect the operating mechanism to the slide.
   a. The threaded portion of the stem shall have a minimum outside diameter of 1-1/2 inches. Stem extension pipes are not acceptable.
   b. The stem shall be constructed of solid stainless steel bar for the entire length, the metal having a tensile strength of not less than 75,000 psi.
   c. The stem shall be 304 stainless steel.
   d. The stem shall be threaded to allow full travel of the slide unless the travel distance is otherwise shown on the Contract Drawings.
   e. Maximum L/R ratio for the unsupported part of the stem shall not exceed 200.
   f. The stem shall be designed to transmit in compression at least 2.5 times the output of the manual actuator with an 40 lb. effort or 1.43 times the stall thrust on electric motor actuators, using the Euler column formula.
   g. The stem shall be designed to withstand the tension load caused by the application of a 40 lb effort on the operating wrench without exceeding 1/5 of the ultimate tensile strength of the stem material.
   h. The threaded portion of the stem shall have machine rolled threads of the full Acme type with a 16 microinch finish or better. Stub threads are not acceptable.
   i. Stems of more than one section shall be joined by stainless steel or bronze couplings. The coupling shall be bolted to the stems.
   j. A field adjusted threaded cast aluminum stop collar shall be provided on all stems with manual actuators to limit downward travel of the slide.

F. STEM GUIDES:

1. Providing integral frame mounted stem guides to limit the L/R ration of the operating stem to 200 or less.
2. Stem guide brackets shall be constructed of aluminum or stainless steel with a minimum thickness of 1/4-inch and shall be outfitted with UHMW or bronze bushings.
3. Stem guides shall adjustable in two directions.

G. STEM COVERS:

1. All rising stem gates shall be provided with clear lexan or butyrate stem covers
2. The stem covers shall be properly vented and closed at the top with a plastic cap.
3. The stem covers shall be provided with field mounted mylar travel indicator strips.

H. ANCHOR BOLTS:

1. Provide adhesive anchors equal to Ramset/Red Head Epcon System or Hilti HIT System.
2. Provide anchor bolts of no less than ½" diameter.
3. Provide all anchor bolts with ample cross section to withstand the force created by operation of the gate.
4. Anchor bolts shall be provided by the gate manufacturer for mounting the gates and appurtenances.
   a. Quantity and location shall be determined by the gate manufacturer.
   b. If epoxy type anchor bolts are provided, the gate manufacturer shall provide the studs and nuts.
5. Install anchor bolts per manufacturer's instructions.

I. PAINTING:

1. All cast iron parts shall be shop coated with a high grade primer, and top coated with a high grade black enamel finish.

J. MANUAL ACTUATORS:

1. The actuators shall be as shown in the Contract Drawings, provided that the effort to operate does not exceed a 40 lb. pull when the gate is subjected to the maximum unbalanced head. If the effort exceeds a 40 lb. pull, a gearbox with sufficient gear ratio shall be supplied to reduce the effort to 40 lb pull.
2. An arrow with the word "OPEN" shall be permanently attached or cast onto the operator to indicate the direction or rotation to open the gate.
3. Gearboxes shall be fully enclosed and shall have a cast aluminum or ductile iron housing.
   a. Gearboxes shall have either single or double gear reduction depending upon the lifting capacity required.
   b. Gearboxes shall be provided with a threaded cast bronze lift nut to engage the operating stem.
   c. Bearings shall be provided above and below the flange on the operating nut to support both opening and closing thrusts.
   d. Gears shall be steel with machined cut teeth designed for smooth operation.
   e. The pinion shaft shall be stainless steel and shall be supported on ball or tapered roller bearings.
   f. Positive mechanical seals shall be provided on the operating nut and the pinion shafts or spur gear operator to exclude moisture and dirt and prevent leakage of lubricant out of the hoist.

4. For the leaf gate and lift gate at the sluiceway, the gate shall be operable via removable hand wheel.
    a. The gate shall be operable from the floor of the timber bridge with a hand wheel mounted to the gate frame.
5. For the low-level outlet slide gates within the chamber the gates, provide manual spur gear operators
    a. The manual spur gear operator shall be constructed of cast or ductile iron. The floor box, if required, shall be constructed of stainless steel or cast iron.
    b. Provide one stainless steel T-handle wrench for operation.
6. Coordination of gates and operators shall be the responsibility of the manufacturer. Gate offsets of up to 1-foot shall be permissible.
7. Provide 2 inch square nut for operations where called.
    a. The square nut shall be constructed of Cast iron or stainless steel.
    b. Provide two aluminum T-handle wrenches for operation. T-wrench shall be hollow to allow for operation of the operating nut with the stem rising through the center of the wrench.

PART 3.00 - EXECUTION

3.01 GENERAL

A. Contractor shall verify all dimensions and connections prior to fabricating the gate, stem or other hardware.

B. Low-Level Outlet gate installation shall be face mounted on the interior concrete walls within the upstream and downstream side of the low-level outlet chamber.

C. The sluiceway gates shall be installed within the stone masonry sluiceway channel, downstream of the timber footbridge. These gates are to share a common frame with a central support.

3.02 STORAGE, HANDLING, AND DELIVERY

A. The contractor will take delivery of the gate(s) directly from the manufacturer. A representative from the State of Rhode Island Department of Environmental Management, the Engineer, and the Contractor shall be present during the delivery of the slide gate(s).

B. Upon receiving the slide gate(s) the Contractor is responsible for protecting the slide gate(s) and its components from damage. Damage present on the slide gate(s) or components upon delivery from the manufacture shall immediately be documented with each the Owner, Engineer, and Manufacturer upon receipt of the slide gate(s). Damage to the slide gate(s) after the Contractor has taken delivery of the slide gate(s) shall be repaired at the Contractor's sole expense in accordance with Manufacturer repair recommendations and procedures.

C. The slide gate(s) and components shall be stored in such a way to prevent any damage and weathering to the structure and components of the slide gate(s). The slide gate(s) shall be stored at a secured location to prevent theft and/or vandalism of slide gate(s) components.

D. The slide gate(s) should be picked from approved pick points in accordance with the manufacturer recommendations. Equipment used to move the slide gate(s) shall be adequately sized and capable of lifting the stated loads without damaging the slide gate(s).

E. The slide gate(s) shall only be delivered to the site when the Contractor is ready to install the slide gate(s) as shown on the attached drawing. The slide gate(s) will not be allowed to stay on-site over-

night, unless it is stored in a secure enclosure, without being installed.

3.03 INSTALLATION

A. Prior to gate installation, Contractor shall implement a bench test of the system complete to demonstrate full operability and functionality of the system. Contractor shall provide Owner/Engineer the opportunity to witness the bench test.

B. Installation of the gate(s) and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the Contractor to handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's recommendations.

C. The Contractor shall review the installation drawings and installation instruction prior to installing the gate(s).

D. The gate(s) assemblies shall be installed in a true vertical plane, square and plumb.

E. The Contractor shall fill the void in between the gate frame(s) and the walls with non-shrink grout (Section 03600) as shown on the installation drawing and in accordance with the manufacturer's recommendations. Alternatively, for the low level outlet gate the Contractor can order and install a custom fit steel thimble in accordance with manufacture recommendations.

3.04 FIELD TESTING

A. After installation, all gates shall be field tested in the presence of the Engineer and Owner to ensure that all items of equipment are in full compliance with this Section. Each gate shall be cycled to confirm that they operate without binding, scraping, or distorting. The effort to open and close manual operators shall be measured, and shall not exceed the maximum operating effort specified above. The gate shall be water tested by the Contractor, and observed by the Engineer and Owner, to confirm that leakage does not exceed the specified allowable leakage.

END OF SECTION

APPENDIX A – PERMITS &

STREAMSTATS REPORT

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF COMPLIANCE & INSPECTION

INTER-OFFICE MEMORANDUM

Date: April 03, 2020

To: Megan DiPrete, Chief
Division of Planning and Development

From: Paul W. Guglielmino, P.E., Principal Civil Engineer
Office of Compliance and Inspection
Dam Safety Program

Subject: Repairs to Wyoming Upper Reservoir Dam (State ID #216)

The Department of Environmental Management's Office of Compliance and Inspection (OCI) has received Pare Corporation's letter dated March 4, 2020, which included plans titled, "Wyoming Upper Reservoir Dam Repairs" and dated March 2020. The letter proposed repair work to the dam, including replacing the right embankment, adding a new low level outlet, replacing the sluice gates, and repairing the spillway and center embankment.

The repair work to Wyoming Upper Reservoir Dam is approved under the following conditions:

1. This approval is specifically limited to the repair work detailed in the submittal to OCI as described above. Major changes or revisions to the work are not authorized without prior approval from OCI.
2. The water level in Wyoming Upper Reservoir may be lowered to elevation 91.0 in order to complete the work (spillway elevation is 96.1);
3. Lowering of the pond shall commence no earlier than July 1 and the lowered elevation shall be achieved no later than October 1;
4. Lowering of the pond shall not exceed three (3) vertical inches per day;
5. If, while the pond is at a lowered elevation, inflow shall cause the pond to rise, the pond shall be lowered as quickly as is safely possible back to the elevation that was present prior to the inflow of water;
6. Upon completion of the work, the pond shall be allowed to return to the seasonally appropriate elevation. During refilling of the pond, approximately 90% of the seasonally appropriate base flow shall be allowed to pass through the dam and be maintained in the channel downstream of the dam (**i.e. only 10% of the flow may be retained in the pond**);

7. Seasonally appropriate base flows shall be maintained in the river downstream of the dam for the duration of the project;
8. Any material utilized in this project must be clean and free of matter that could pollute any water of the State including freshwater wetlands;
9. Best management practices for erosion and sediment controls shall be used as needed. Temporary controls to prevent soil from eroding off of the site into the adjacent pond or stream shall be installed prior to commencing the maintenance. All controls must be maintained in effective operating condition during the work, and all exposed soil and other fills must be permanently stabilized at the earliest possible date following completion of the work. Following stabilization of the work area, all temporary soil erosion controls such as silt fencing must be removed (For guidance see Rhode Island Soil Erosion and Sediment Control Handbook and Rhode Island Stormwater Design and Installation Standards Manual.);
11. All repair work shall be protective of water quality and freshwater wetland functions and values so as to prevent pollutants, sediment, direct discharge of stormwater runoff, or any material foreign to waters of the State including freshwater wetlands, or hazardous to life, from entering any waters of the State including freshwater wetlands;
13. During the repair work, the engineer responsible for the design shall maintain sufficient oversight of the project to be able to certify, upon completion of the work, that it was completed in conformance with the documents approved herein; and
14. Upon completion of the repair work and only if there was any significant change from the approved plans, a set of as-built plans shall be provided to OCI for our file.

A copy of the stamped-approved plans is attached.

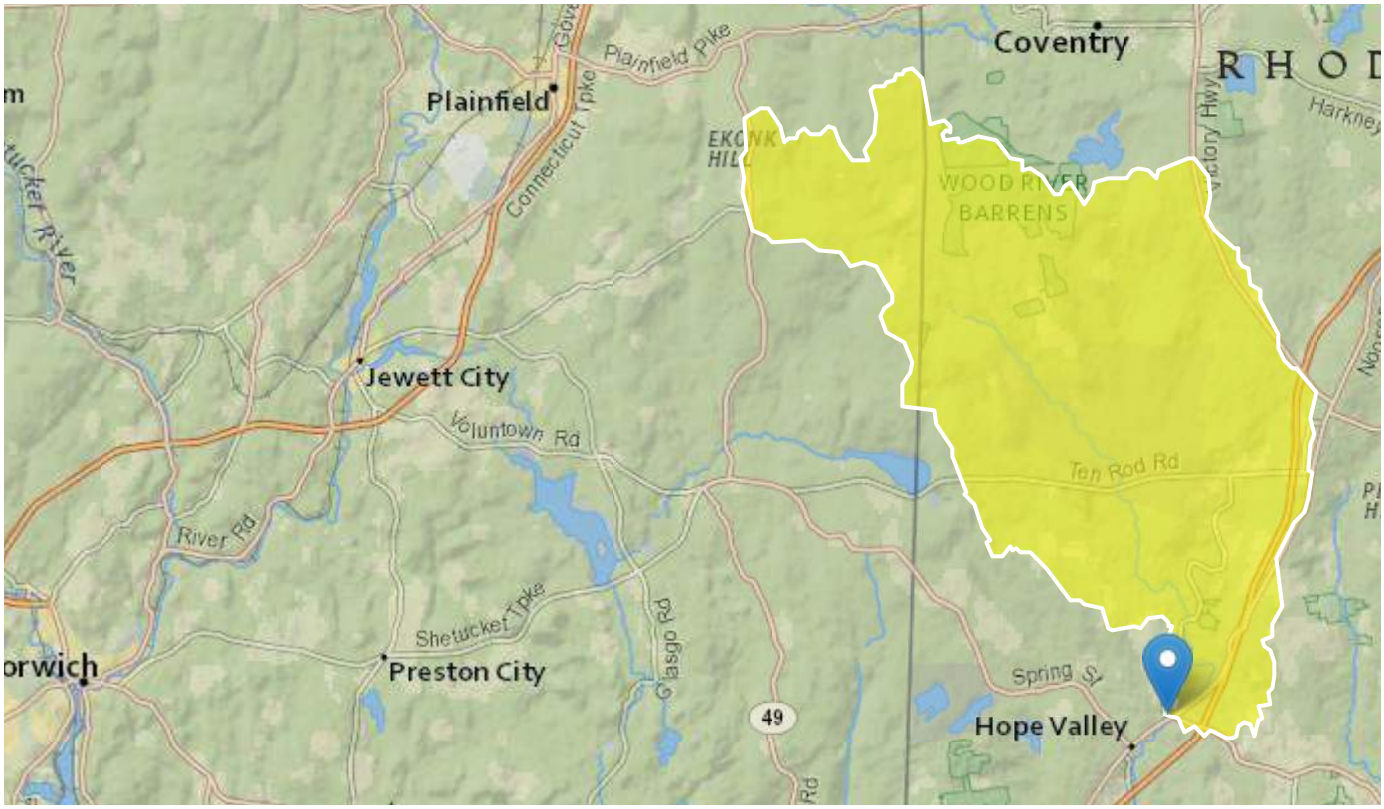
Please contact me at (401) 222-1360, x7122 or email at paul.guglielmino@dem.ri.gov upon initiation and completion of the project, or if you have any questions on this matter.

Enc.: Approved plans

Cc: David R. Caouette, P.E., Pare Corporation
David Chopy, DEM OCI
Steve Tyrrell, DEM OCI
Katie DeGoosh DEM Water Resources
Angela Harvey, DOH Water Quality
Marc R. Pappas, Director, Emergency Management Agency
Spencer Peck, Emergency Management Agency
Ronald J. MacDonald, III, Director, Hopkinton Emergency Management
Joseph Arsenault, Director, Richmond Emergency Management

StreamStats Report Wyoming Upper Reservoir

Region ID: RI
Workspace ID: RI20181113202713319000
Clicked Point (Latitude, Longitude): 41.51550, -71.70412
Time: 2018-11-13 15:25:08 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	57.8	square miles
STRDENED	Stream Density -- total length of streams divided by drainage area, edited from NHD	1.3	miles per square mile
STRDEN	Stream Density -- total length of streams divided by drainage area	1.36	miles per square mile
STORNHD	Percent storage (wetlands and waterbodies) determined from 1:24K NHD	7.28	percent

Flow-Duration Statistics Parameters [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	57.8	square miles	0.52	294
STRDENED	Stream Density Edited	1.3	miles per square mile	0.94	3.49

Flow-Duration Statistics Disclaimers [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

Weighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

Flow-Duration Statistics Flow Report [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SEp
1 Percent Duration	481	ft^3/s	157	1470	21.3
2 Percent Duration	400	ft^3/s	132	1210	19.2
5 Percent Duration	307	ft^3/s	101	932	19.7
10 Percent Duration	252	ft^3/s	118	540	17.7
15 Percent Duration	209	ft^3/s	97.4	447	17.9
20 Percent Duration	173	ft^3/s	80.3	371	18.3
25 Percent Duration	168	ft^3/s	55.6	505	18
30 Percent Duration	150	ft^3/s	49.7	453	18.4
40 Percent Duration	122	ft^3/s	40.5	369	18.2
50 Percent Duration	94.5	ft^3/s	31.3	286	18.8
60 Percent Duration	72.2	ft^3/s	23.6	220	20.8
70 Percent Duration	55.4	ft^3/s	17.7	173	25.4
75 Percent Duration	48.5	ft^3/s	15	157	31
80 Percent Duration	42.4	ft^3/s	12.4	144	38
85 Percent Duration	35.9	ft^3/s	9.66	134	49.3
90 Percent Duration	32.4	ft^3/s	6.94	151	75.5
95 Percent Duration	25.4	ft^3/s	4.35	148	

Statistic	Value	Unit	PIl	PIu	SEp
98 Percent Duration	20.8	ft^3/s	3.19	136	
99 Percent Duration	18.8	ft^3/s	2.41	146	

Flow-Duration Statistics Citations

Bent, G.C., Steeves, P.A., and Waite, A.M.,2014, Equations for estimating selected streamflow statistics in Rhode Island: U.S. Geological Survey Scientific Investigations Report 2014–5010, 65 p. (http://dx.doi.org/10.3133/sir20145010)

Low-Flow Statistics Parameters [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	57.8	square miles	0.52	294
STRDENED	Stream Density Edited	1.3	miles per square mile	0.94	3.49

Low-Flow Statistics Disclaimers [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

Weighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

Low-Flow Statistics Flow Report [99 Percent (57.4 square miles) Statewide Low Flow 2014 5010]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu
7 Day 2 Year Low Flow	27.1	ft^3/s	5.16	142
7 Day 10 Year Low Flow	16.5	ft^3/s	1.92	142

Low-Flow Statistics Citations

Bent, G.C., Steeves, P.A., and Waite, A.M.,2014, Equations for estimating selected streamflow statistics in Rhode Island: U.S. Geological Survey Scientific Investigations Report 2014–5010, 65 p. (http://dx.doi.org/10.3133/sir20145010)

Peak-Flow Statistics Parameters [99 Percent (57.4 square miles) Statewide peak 2012 5109]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	57.8	square miles	4	404
STRDEN	Stream Density	1.36	miles per square mile	1.25	3.53
STORNHD	Percent Storage from NHD	7.28	percent	3.37	19

Peak-Flow Statistics Disclaimers [99 Percent (57.4 square miles) Statewide peak 2012 5109]

Weighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

Peak-Flow Statistics Flow Report [99 Percent (57.4 square miles) Statewide peak 2012 5109]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	SEp
5 Year Peak Flood	1050	ft^3/s	665	1660	25.1	27.2
10 Year Peak Flood	1360	ft^3/s	875	2100	23.4	25.9
25 Year Peak Flood	1830	ft^3/s	1210	2750	20.9	24
50 Year Peak Flood	2210	ft^3/s	1450	3360	21.1	24.5
100 Year Peak Flood	2620	ft^3/s	1720	3990	20.6	24.2
200 Year Peak Flood	3030	ft^3/s	1910	4790	22.3	26.6
500 Year Peak Flood	3630	ft^3/s	2180	6040	24.8	29.6

Peak-Flow Statistics Citations

Zarriello, P.J., Ahearn, E.A., and Levin, S.B.,2012, Magnitude of flood flows for selected annual exceedance probabilities in Rhode Island through 2010: U.S. Geological Survey Scientific Investigations Report 2012–5109, 93 p. (http://pubs.usgs.gov/sir/2012/5109)

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Application Version: 4.2.1

APPENDIX B – SEDIMENTATION SAMPLING REPORT

Engineers | Scientists | Planners

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PARE CORPORATION

November 21, 2018

Ms. Jillian Thompson
Project Manager
Rhode Island Department of Environmental Management
Division of Planning and Development
235 Promenade Street,
Providence, Rhode Island 02908

Re: **Upper Wyoming Reservoir Dam**
Sediment Sampling Summary Report
Hopkinton, Rhode Island
(Pare Project No.:16226.00)

Dear Ms. Thompson:

In accordance with our proposal, Pare Corporation (Pare) is pleased to provide the Rhode Island Department of Environmental Management (RIDEM) with this summary of the sediment sampling program conducted at the Upper Wyoming Reservoir Dam in Hopkinton, Rhode Island (Site). The intent of the sediment sampling program was to determine the characteristics of the soils that may be dredged during potential low-level outlet rehabilitation scenarios. Specifically, the scope of work included a limited desktop due diligence review, soil probing near the low-level outlet for sediment quantification, and the collection of sediment samples from within the existing impoundment and from the downstream channel for physical and chemical analysis. Each of these tasks and their impacts upon the proposed low-level outlet rehabilitation project are discussed in more detail in the sections below.

Desktop Due Diligence

Pare performed a due diligence review of the area surrounding the Upper Wyoming Reservoir (also known as "Wyoming Pond") Dam, in Hopkinton, Rhode Island (Site) to evaluate the likelihood that sediment in the impoundment has been contaminated by oil or hazardous materials. Specifically, the due diligence review consisted of identifying contaminated properties that, through groundwater or overland migration, currently or previously had the potential to impact sediment behind the dam. The evaluation included the review of a radius map report from Environmental Data Resources (EDR), which provided a database listing of known hazardous waste sites and oil/hazardous material releases within a pre-defined search radius. For this review, the search radius was limited to an area within 1-mile of the impoundment. Pare also performed a review of historical aerial photography, topographic maps, and Sanborn Fire Insurance maps that were also received from EDR. Based on the information provided in the EDR report, Pare visited the RIDEM for further review of some properties of concern. Finally, Pare contacted the local Fire Department and Planning Department regarding their knowledge of the Site and surrounding area as it pertains to potential environmental issues and historical land use.

Pare reviewed historical topographic maps for the Site and surrounding watershed using the Historical Topo Map Report provided by EDR for the years 2012, 2001, 1975, 1970, 1953, 1943, 1894, and 1889. The area upstream of the Site appears to be undeveloped in the 1889 and 1894 topographic maps, while the Village of Wyoming is clustered around the dam. The 1943 topographical map shows some sparse development upstream of the Site, as well as increased development in Wyoming and Rhode Island Route 3 (Route 3) running north to

south parallel to Wyoming Pond. The 1953 map shows Interstate 95 (I-95) under construction, running north to south, east of the Site. The topographical maps from 1970 to 2012 show increased development upstream of the Site, including some residential developments north of Wyoming Pond. In addition to conducting a review of topographic maps, Pare reviewed aerial photographs of the project area watershed from the years 2016, 2012, 2008, 2005, 2001, 1995, 1990, 1986, 1981, 1970, 1962, 1960, 1951, 1941, and 1939 that were provided by EDR. All aerial photographs reviewed show the area upstream of the Site as mostly residential development, with some commercial development south of the Site. The aerial photographs from 1939 to 1970 show large plots of cleared land, which were presumably used for agriculture, north of the Site. Beginning in the 1981 photograph, this land eventually becomes developed for residential use. All aerial photographs show Wyoming Pond stretching northeast from the dam, as well as the Wood River running southwest. The aerial photographs from 1981 to 2016 show a large commercial development along Rhode Island Route 138 (Route 138), east of the Site. The Historical Topographic Maps and Aerial Photographs are provided in Attachments E and F.

Pare reviewed Sanborn Fire Insurance Maps, provided by EDR, for the Site and surrounding area for the years 1945, 1935, and 1924. All of the Sanborn maps reviewed show residential dwellings along Main Street, south of the Site. All of the maps show a wool mill approximately 500 feet downstream of Site (southwest) along the Wood River, as well as a building near the northern bank of the dam that was associated with the mill and appeared to have been used for weaving. The maps also indicate a building on the southern bank of the dam labeled E.R. Bitgood Box Shop, which may have been used for manufacturing. The Sanborn Fire Insurance Maps are provided in Attachment D.

After reviewing the EDR Radius Map Report, which is provided in Attachment C, Pare identified three (3) release properties located within the specified, which were selected for further review at RIDEM. Pare visited the RIDEM Office of Waste Management on August 9, 2018. The release properties are described in detail below:

- <u>Exxon Station, 1209 Main St, Wyoming, RI (approximately 2,200 ft southeast of the Site):</u> A site assessment performed by Environmental Science Services in 1991 revealed concentrations of benzene, toluene, ethylbenzene, and xylene (BTEX) in groundwater samples at the property. The property was operating as a gas station and convenience store until June 2008, when the underground storage tanks (USTs), pump islands, and associated appurtenances were removed. A release in 1993 during a Stage II Recovery installation resulted in the removal of approximately 300 cubic yards (cy) of impacted soil. A pneumatic pumping system was installed in 1993 and groundwater monitoring at the site began in 1994. A gasoline tanker overturned in August 1997, near the adjacent 1-95 exit ramp, resulting in a surface spill of approximately 450 gallons of gasoline; RIDEM stated that the spill was contained in the nearby storm drain system and no further investigation was done at the site relating to that spill. A Phase I site assessment conducted in 2006 by the owner of an adjacent property revealed groundwater concentration of benzene and methyl tert-butyl ether (MTBE) in excess of RIDEM criteria. Remedial actions taken at the site include several enhanced fluid recovery (EFR) events between 2007 and 2010 and injections of a surfactant-enhanced chemical oxidant into monitoring wells between 2010 and 2012. In addition, approximately 101 tons of impacted soil was removed from the site during the UST removal in 2008. Groundwater monitoring at the site continued until June 2015, which yielded benzene concentrations just above the GAA Leachability Criteria. However, due to natural attenuation and the relatively low concentrations of benzene, RIDEM stated in 2015 that No Further Action was required at the site. Records indicate that the groundwater flow at the property is in the southeast direction, away from the dam.

- DB Mart, 1190 Main St, Wyoming, RI (approximately 1,400 ft southeast of the Site): In 1997, an environmental assessment performed by Lincoln Environmental at this property, which operates as a gas station, revealed groundwater concentrations of toluene, ethylbenzene, and benzene exceeding their GAA Groundwater Quality Standards. A 2006 site investigation discovered a dissolved phase gasoline plume at the site. Groundwater sampling began at the site in 2007, and in 2010 RIDEM approved monitored natural attenuation (MNA) as the corrective action at the site. The groundwater sampling round for March 2011 yielded concentrations of ethylbenzene and naphthalene exceeding the applicable GA Criteria; however, RIDEM declared "No Action Necessary" at the site due to the historic decreasing of these contaminants over the period of groundwater monitoring. During the removal of four (4) USTs in December 2017, groundwater sampling revealed no GA Criteria exceedances, although approximately 210 tons of petroleum-impacted soil was removed from the site.

- Mobil Station, 1214 Main St, Wyoming, RI (approximately 2,250 ft southeast of the Site): Records reviewed by Pare show correspondence between the owner of the property, Exxon Company, and the Environmental Protection Agency (EPA) in February 1984, with regards to contamination at the site. The site, which was operated as a gas station, contained evidence of a petroleum plume. Remedial action proposed to the EPA included an interception system to mitigate the effects of the contamination and supplying potable water to residences that were impacted by the release. There was no record past 1984 that indicate the outcome of the remedial activities or the concentrations of contaminants at the site. Records in the site's UST file indicate that there are currently three (3) diesel and gasoline USTs at the site. The latest inspection, performed in July 2018, showed that no leaks were detected in the USTs currently at the site.

Pare contacted the Hope Valley and Wyoming Fire District on August 17, 2018 to obtain information with respect to releases of oil and hazardous materials in the area upstream of the Site, which through migration could potentially result in contamination to sediment behind the dam. District Fire Chief Justin Lee stated that they had no records of any spills or contaminations that may have affected the soil in the watershed. Pare also contacted the Town of Richmond Planning Department on August 14, 2018. Ms. Juliana Berry, Town Planner for the Town of Richmond, stated that she was unaware of any release of contaminants in the area surrounding the Site and was unaware of any agricultural or other industrial land uses at or surrounding the Site that may have impacted sediment behind the dam. Ms. Berry said that the area surrounding the dam was mostly residential and mentioned an old utility building owned by RIDEM that abuts the dam to the south, but said it was unlikely to have impacted the impoundment.

Based on our review of the EDR report, the historical data provided by EDR, the RIDEM file review, and our correspondence with local officials, Pare identified three (3) properties located in the watershed that appear to have the potential to impact sediment behind the dam. However, based on the properties distances from the dam and location cross-gradient to the Site, the remediation efforts undertaken at the release properties, and their current compliance status, it appears the impact to sediment located behind the dam from these releases is likely insignificant.

Considering the Site's proximity to a major roadway (Route 3), sediment within the impoundment may be impacted by roadway runoff. It is likely that the contaminants commonly associated with roadway runoff (i.e., metals, petroleum, PAHs) are present to some degree in sediment behind the dam. In addition, the historical industrial uses in the area may have impacted the sediment behind the dam. While the due diligence review did not identify any significant releases in the watershed that would impact the viability of the proposed repairs at the Site, sampling and analysis was performed on sediment within the impoundment and downstream of the dam to evaluate the most appropriate means of handling in-situ sediment during potential dredging activities (see below).

Sediment Quantification

On July 31, 2018, Pare completed a program of probes within the limits of the impoundment. The probes measured and recorded the depth of the existing mud line and the depth to refusal on hard bottom, which is assumed to be the natural pond bottom. Probe locations were recorded utilizing a handheld global positioning system (GPS) device with sub-meter accuracy (see attached Sediment Survey Plan).

Sediment Characterization

On July 31, 2018, Pare personnel collected three (3) core samples of sediment from within the existing impoundment and one (1) core sample from the downstream channel for chemical and physical analysis. The three (3) core samples collected from the existing impoundment were identified as US-1, US-2, and US-3 while the single core sample collected from the downstream channel was identified as DS-1. Core locations were selected in order to provide generally uniform spatial distribution upstream and downstream of the impoundment with consideration to accessibility and areas where dam modifications are proposed. Each sample was collected in laboratory-provided glassware and transported with chain-of-custody documentation to New England Testing Laboratory, Inc. (NETLab) of West Warwick, Rhode Island for chemical and physical analysis. The samples were analyzed for the following parameters:

- Total Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, and Zinc);
- Polychlorinated Biphenyls (PCBs);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Total Petroleum Hydrocarbons (TPH);
- Extractable Petroleum Hydrocarbons (EPH);
- Percent Volatile Solids;
- Percent Water; and
- Grain Size Distribution – Wet Sieve (ASTM D422).

NETLab provided chemical and physical analytical results on August 7, 2018, which are summarized in Attachment G - Analytical Data Summary Table. Laboratory certificates of analysis and chain-of-custody documentation are provided in Attachment H.

A sieve analysis was performed on the four (4) sediment samples (see Attachment H). The results of the sieve analysis indicate that US-1 is primarily dark brown poorly graded sand with gravel, US-2 is primarily brown silty sand, US-3 is primarily brown silty sand, and DS-1 is primarily brown poorly graded gravel with sand. The silt content (i.e., particles passing the #200 sieve) for US-1 was 0.4%, for US-2 it was 33.7%, for US-3 it was 36.4, and for DS-1 it was 0.3%. The MassDEP guidance document entitled *Dam Removal and Wetland Regulations*[1] indicates the following with respect to fine-grained sediments:

> "Fine-grained sediments (i.e., those passing the #200 sieve) have a higher potential for having chemical contaminant adsorption. Fine-grained sediments, whether or not contaminated, are also more likely to be transported as the river sediment load to distant points downstream and ultimately to the ocean."

Therefore, samples with high percentages of fines (i.e., greater than 10% according to the MassDEP Dam Removal guidance document), pose a higher risk of mobilizing and distributing potentially-contaminated sediment downstream during the construction process. Based on the results of the sieve analysis, there is a

[1] Dam Removal and Wetland Regulations, March 2007, MassDEP Bureau of Resource Protection, Wetlands/Waterways Program.

significant risk that sediment located behind the dam will remobilize during construction and be redistributed downstream.

Pare compared the analytical results to two potentially applicable screening criteria, as shown in Attachment G. These two sediment screening criteria cover two potential jurisdictional conditions that could arise from the removal of sediment from behind the dam. Should the sediment be disturbed and carried downstream and naturally redistributed, the sediment would be jurisdictional under the Rhode Island Department of Environmental Management (RIDEM) 401 Water Quality Regulations. Sediment management objectives are not established in Rhode Island, and therefore the analytical results were compared to Threshold Effects Concentration (TEC) criteria and Probable Effects Concentration (PEC) criteria as described in the *MassDEP Revised Sediment Screening Values, Interim Technical Update*.[2] In areas where the sediment may become exposed, such as stockpiling of the material and/or upland reuse of the material, the sediment would be jurisdictional under the RIDEM Remediation Regulations. Therefore, the concentrations of contaminants in the sediment samples were also compared to the RIDEM Method 1 Residential Direct Exposure Criteria (R DEC) cleanup standards.

All contaminants were compared to their respective TEC and PEC values. No contaminants were reported in US-1 above their respective TEC values. Four (4) contaminants reported in US-2 exceeded their respective TEC values. Two (2) contaminants reported in US-3 exceeded their respective TEC values. All of the contaminants reported above their respective TEC values in US-2 and US-3 were metals. Eight (8) contaminants (two (2) metals and six (6) PAHs) reported in DS-1 exceeded their respective TEC values. No contaminants in any of the samples were reported above their respective PEC values.

The RIDEM R DEC cleanup standard was slightly exceeded for arsenic (10.9 mg/kg) at US-2. The R DEC criteria was also exceeded for TPH (833 mg/kg) at US-2. The downstream sample, DS-1, was reported to have concentrations of two (2) PAHs – benzo[a]pyrene and chrysene (437 mg/kg and 471 mg/kg, respectively) – above their respective R DEC criterion. Therefore, should this sediment become exposed as part of the rehabilitation project it would be jurisdictional under the RIDEM Remediation Regulations.

Recommendations

Based on the results of Pare's due diligence, sediment sampling and analysis, it appears upland reuse of this material is not feasible, as contaminants in the sediment are above the RIDEM R DEC. Therefore, it is recommended that dredged sediment be dewatered and disposed of off-site at a licensed solid waste facility.

The upstream samples were reported to have metals in excess of their respective TEC aquatic screening criteria. In addition, two (2) of the three (3) upstream samples were reported to contain a significant amount of fine sediment (i.e., greater than 10% passing the #200 sieve). Therefore, the likelihood of significant amounts of sediment being remobilized downstream is high. To reduce potential impacts of the remobilized sediment, Pare recommends that during dredging activities silt barriers be erected to prevent sediment upstream of the Upper Wyoming Pond Dam outlet from entering the outlet channel.

[2] "*Revised Sediment Screening Values – Update to: Section 9 of Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan (1996)*," dated January 2006.

If you have any questions, please do not hesitate to call us at 508.543.1755.

Sincerely,

PARE CORPORATION

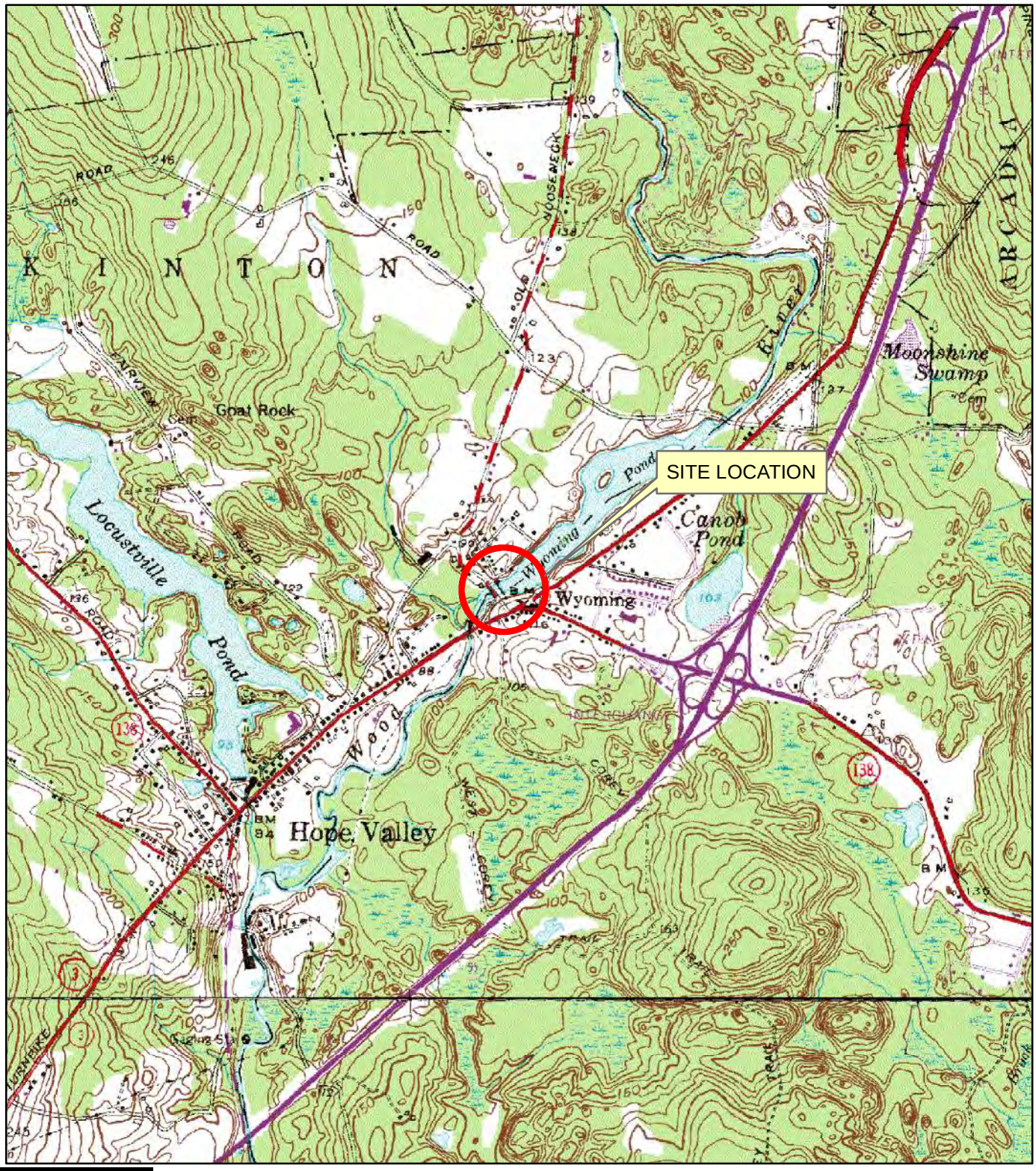
Shane Driscoll, P.E., LEED AP
Project Engineer

J. Matthew Bellisle, P.E.
Senior Vice President

Timothy P. Thies, P.E.
Vice President

Attachments:
A – Locus Map
B – Sediment Survey Plan
C – EDR Radius Map Report
D – EDR Sanborn Fire Insurance Map Report
E – EDR Historical Topographic Map Report
F – EDR Historical Aerial Photography Report
G – Analytical Data Summary Table
H – Laboratory Certificates of Analysis & Chain-of-Custody Documentation

Y:\JOBS\16 Jobs\16226.00 RIDEM Wyoming Upper Res Design Repairs-RI\Environmental\Sediment Sampling Summary Report.doc



[redacted]

SITE LOCATION MAP

SCALE:1"=2,000'

N
W E
S

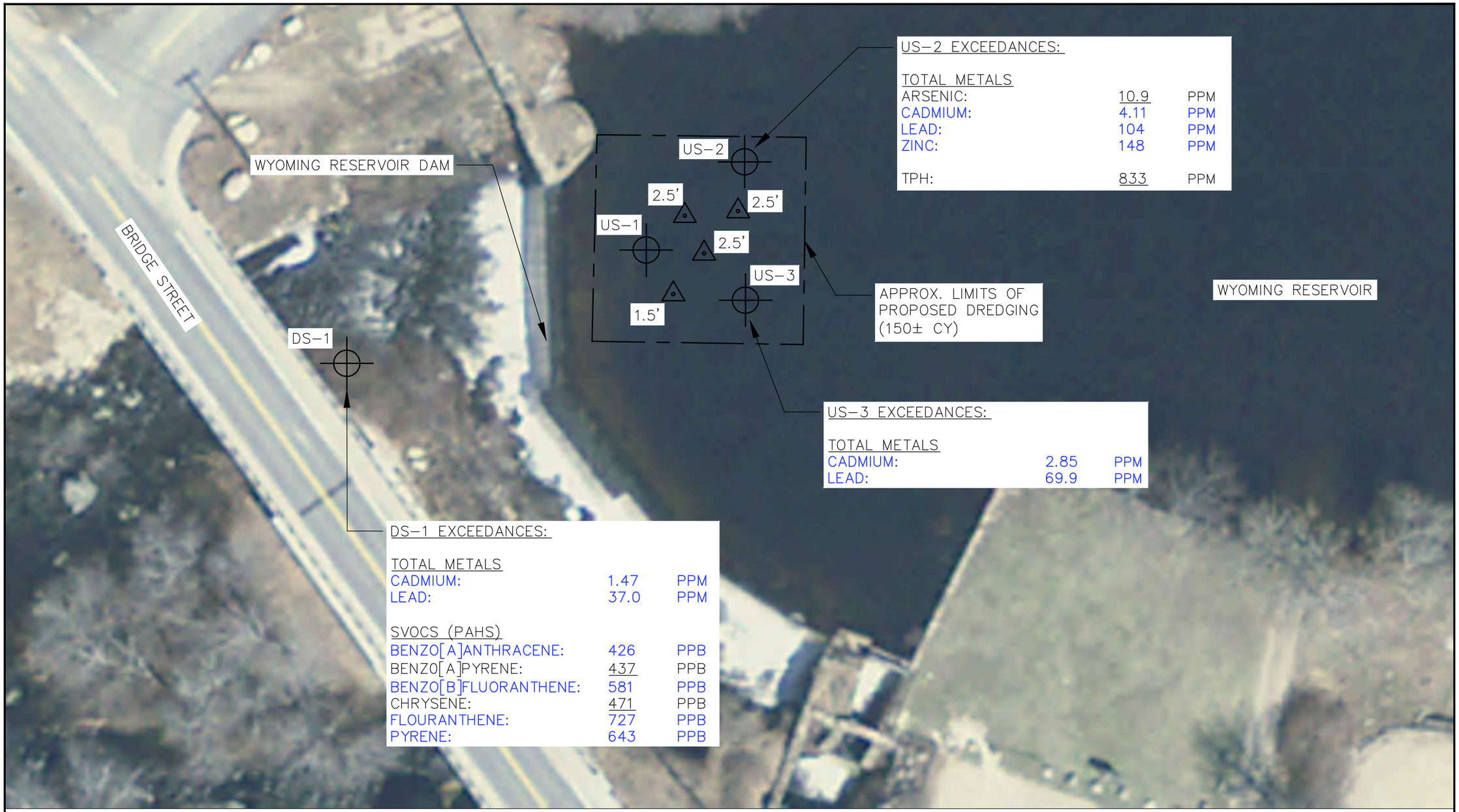
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
(401) 334-4100

10 LINCOLN ROAD, SUITE 210
FOXBORO, MA 02035
(508) 543-1755

PARE PROJECT No. 16226.00 AUGUST 2018

ATTACHMENT 1

WYOMING UPPER RESERVOIR
WYOMING, RI



US-2 EXCEEDANCES:

TOTAL METALS		
ARSENIC:	10.9	PPM
CADMIUM:	4.11	PPM
LEAD:	104	PPM
ZINC:	148	PPM
TPH:	833	PPM

US-3 EXCEEDANCES:

TOTAL METALS		
CADMIUM:	2.85	PPM
LEAD:	69.9	PPM

DS-1 EXCEEDANCES:

TOTAL METALS		
CADMIUM:	1.47	PPM
LEAD:	37.0	PPM
SVOCS (PAHS)		
BENZO[A]ANTHRACENE:	426	PPB
BENZO[A]PYRENE:	437	PPB
BENZO[B]FLUORANTHENE:	581	PPB
CHRYSENE:	471	PPB
FLOURANTHENE:	727	PPB
PYRENE:	643	PPB

NOTES AND LEGEND

1. PLAN DEVELOPED FROM AVAILABLE AERIAL IMAGERY FROM RIGIS. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.

US-## SEDIMENT SAMPLE GPS-LOCATED AND COLLECTED BY PARE ON JULY 31, 2018

FT SEDIMENT THICKNESS AS RECORDED BY PARE ON JULY 31, 2018

= TEC EXCEEDANCE

= PEC EXCEEDANCE

= RIDEM R DEC EXCEEDANCE

SEDIMENT SAMPLING PLAN

SCALE: 1"=30'

SCALE ADJUSTMENT GUIDE

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING

PARE

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
10 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-1200

Upper Wyoming Reservoir Dam

Wyoming, Rhode Island

REVISIONS:

PROJECT NO.:	16226.00
DATE:	AUGUST 2018
SCALE:	1" = 30'
DESIGNED BY:	NPM
CHECKED BY:	SPD
DRAWN BY:	NPM
APPROVED BY:	TPT

DRAWING TITLE:

SEDIMENT SAMPLING PLAN

FIGURE NO.: 1

SHEET NO. 1 OF 1

Wyoming Upper Reservoir Dam
Bridge St
Wyoming, RI 02898

Inquiry Number: 5380707.2s
August 02, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

BRIDGE ST
WYOMING, RI 02898

COORDINATES

Latitude (North):	41.5159040 - 41˚ 30' 57.25''
Longitude (West):	71.7033780 - 71˚ 42' 12.16''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	274407.3
UTM Y (Meters):	4599346.0
Elevation:	92 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5642171 HOPE VALLEY, RI
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140718
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
BRIDGE ST
WYOMING, RI 02898

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	HOPE VALLEY TOWING I	1120 MAIN ST	RCRA NonGen / NLR, FINDS, ECHO	Higher	502, 0.095, SSW
2	BIG A AUTO PARTS		RI UST	Higher	590, 0.112, ESE
3	ST. JOSEPH'S CHURCH	1105 MAIN ST	RI UST	Lower	762, 0.144, SW
A4	RI D O T MAINTENANCE	51 BANK ST	RCRA-SQG, NJ MANIFEST, RI MANIFEST	Lower	1196, 0.227, West
A5	HOPE VALLEY GARAGE (	51 BANK ST	RI UST	Lower	1242, 0.235, West
A6	RI DOT GARAGE	51 BANK STREET	RI LUST	Lower	1242, 0.235, West
7	DOWNTOWN AUTO REPAIR	1100 MAIN ST	RI LUST, RCRA NonGen / NLR, RI MANIFEST	Higher	2138, 0.405, SW
8	EXXON STATION	1209 MAIN STREET	RI LUST, RI SPILLS	Higher	2336, 0.442, ESE
9	WOODMANSEE H C SON I	8 FAIRVIEW AVE	RI SHWS, RI LUST, RCRA NonGen / NLR, RI MANIFEST	Higher	2494, 0.472, WSW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-CESQG ..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROL ..... Sites with Institutional Controls

EXECUTIVE SUMMARY

Federal ERNS list

ERNS..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

RI SWF/LF..... Solid Waste Management Facilities
RI LCP..... Landfill Closure Program Sites in RI

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
RI AST..... Aboveground Storage Tanks
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

RI AUL..... Waste Management Sites with Environmental Land Use Restrictions

State and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

RI BROWNFIELDS..... Brownfields Site List

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register
RI CDL..... Clandestine Drug Lab Information Listing
US CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
RI SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
RI AIRS	Air Emissions Listing
RI ASBESTOS	ASBESTOS
RI DRYCLEANERS	Drycleaner Facility Listing
RI Financial Assurance	Financial Assurance Information
RI LEAD	Lead Inspections Database
RI NPDES	Permit and Facility Data

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Hist Auto..... EDR Exclusive Historical Auto Stations
EDR Hist Cleaner..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RI RGA HWS..... Recovered Government Archive State Hazardous Waste Facilities List
RI RGA LF..... Recovered Government Archive Solid Waste Facilities List
RI RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/01/2018 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
RI D O T MAINTENANCE	***51 BANK ST***	***W 1/8 - 1/4 (0.227 mi.)***	***A4***	***12***

State- and tribal - equivalent CERCLIS

RI SHWS: This list includes sites that have been investigated under the Federal CERCLIS program (SFA sites) as well as sites that have notified under the state program or have been investigated for hazardous substances (HWM sites).

A review of the RI SHWS list, as provided by EDR, and dated 03/08/2018 has revealed that there is 1 RI SHWS site within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WOODMANSEE H C SON I	***8 FAIRVIEW AVE***	***WSW 1/4 - 1/2 (0.472 mi.)***	***9***	***30***
Facility Status: Inactive				
Project Code: HCWS-HWM				
Siterem Site Number: SR-14-0574				

State and tribal leaking storage tank lists

RI LUST: The LUST Case List is a summary of UST Facilities in RI with leaking USTs, which includes information on the date of release discovery and the status of the LUST Case (active, soil removal only, or inactive).

A review of the RI LUST list, as provided by EDR, and dated 04/05/2018 has revealed that there are 4 RI LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DOWNTOWN AUTO REPAIR	***1100 MAIN ST***	***SW 1/4 - 1/2 (0.405 mi.)***	***7***	***24***
Facility Status: Soil Removal Only; No Further Action Required				
Facility Id: 16078				
Project Number: 1415-LS				
EXXON STATION	***1209 MAIN STREET***	***ESE 1/4 - 1/2 (0.442 mi.)***	***8***	***30***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required				
Facility Id: 1257				
Project Number: 2903-LS				
WOODMANSEE H C SON I	***8 FAIRVIEW AVE***	***WSW 1/4 - 1/2 (0.472 mi.)***	***9***	***30***
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required				
Facility Id: 18624				
Project Number: 1413-LS				

Lower Elevation	Address	Direction / Distance	Map ID	Page
RI DOT GARAGE	51 BANK STREET	W 1/8 - 1/4 (0.235 mi.)	A6	24
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required				
Facility Id: 1280				
Project Number: 1406-LS				

State and tribal registered storage tank lists

RI UST: The UST Master List is a summary of registered UST Facilities in RI, which includes information on abandoned, in use, permanently closed and temporarily closed USTs.

A review of the RI UST list, as provided by EDR, and dated 04/05/2018 has revealed that there are 3 RI UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BIG A AUTO PARTS		ESE 0 - 1/8 (0.112 mi.)	2	11
Facility Id: UST-16147				

Tank Status: Permanently Closed

Lower Elevation	Address	Direction / Distance	Map ID	Page
ST. JOSEPH'S CHURCH Facility Id: UST-16481 Tank Status: Permanently Closed	1105 MAIN ST	SW 1/8 - 1/4 (0.144 mi.)	3	11
HOPE VALLEY GARAGE (Facility Id: UST-1280 Tank Status: Permanently Closed Tank Status: In Use	51 BANK ST	W 1/8 - 1/4 (0.235 mi.)	A5	23

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/01/2018 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HOPE VALLEY TOWING I	***1120 MAIN ST***	***SSW 0 - 1/8 (0.095 mi.)***	***1***	***8***

RI MANIFEST: Hazardous waste manifest information

A review of the RI MANIFEST list, as provided by EDR, and dated 12/31/2017 has revealed that there is 1 RI MANIFEST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
RI D O T MAINTENANCE EPA Id: RID987466703 Manifest Document Number: RIG0001835	***51 BANK ST***	***W 1/8 - 1/4 (0.227 mi.)***	***A4***	***12***

NJ MANIFEST: Hazardous waste manifest information.

A review of the NJ MANIFEST list, as provided by EDR, and dated 12/31/2017 has revealed that there is 1 NJ MANIFEST site within approximately 0.25 miles of the target property.

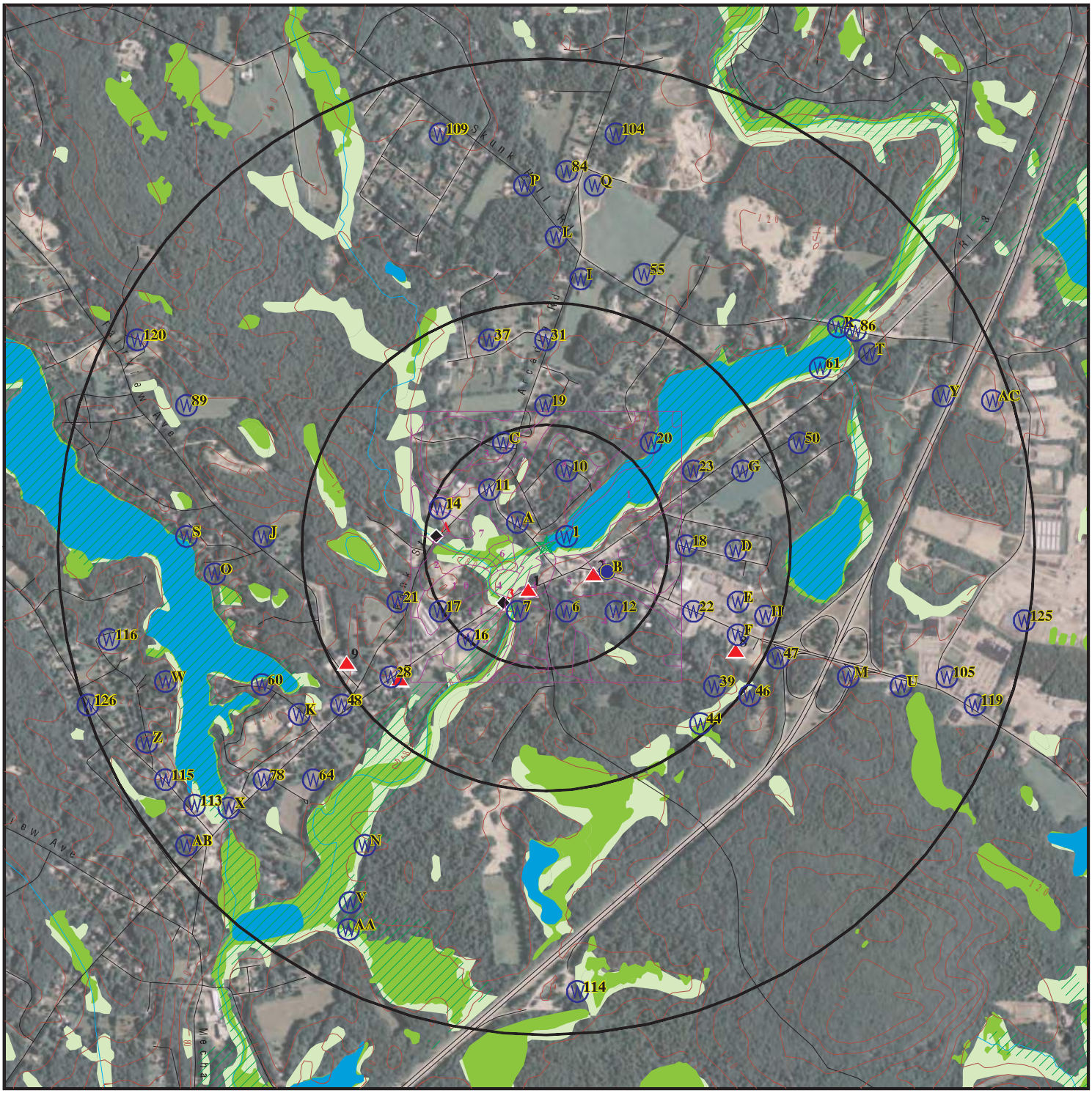
Lower Elevation	Address	Direction / Distance	Map ID	Page
RI D O T MAINTENANCE EPA Id: RID987466703 Manifest Document Number: RIG0001835	***51 BANK ST***	***W 1/8 - 1/4 (0.227 mi.)***	***A4***	***12***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 4 records.

Site Name	Database(s)
RICHMOND ELEMENTARY SCHOOL	RI SHWS
CHARIHO REGIONAL VOCATIONAL SCHOOL	RI SHWS
DB MART - RT 138	RI LUST
MOBIL STATION	RI LUST

OVERVIEW MAP - 5380707.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Upgradient Area

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Wyoming Upper Reservoir Dam	CLIENT:	Pare Corporation
ADDRESS:	Bridge St Wyoming RI 02898	CONTACT:	Nathan Meersman
		INQUIRY #:	5380707.2s
LAT/LONG:	41.515904 / 71.703378	DATE:	August 02, 2018 1:03 pm

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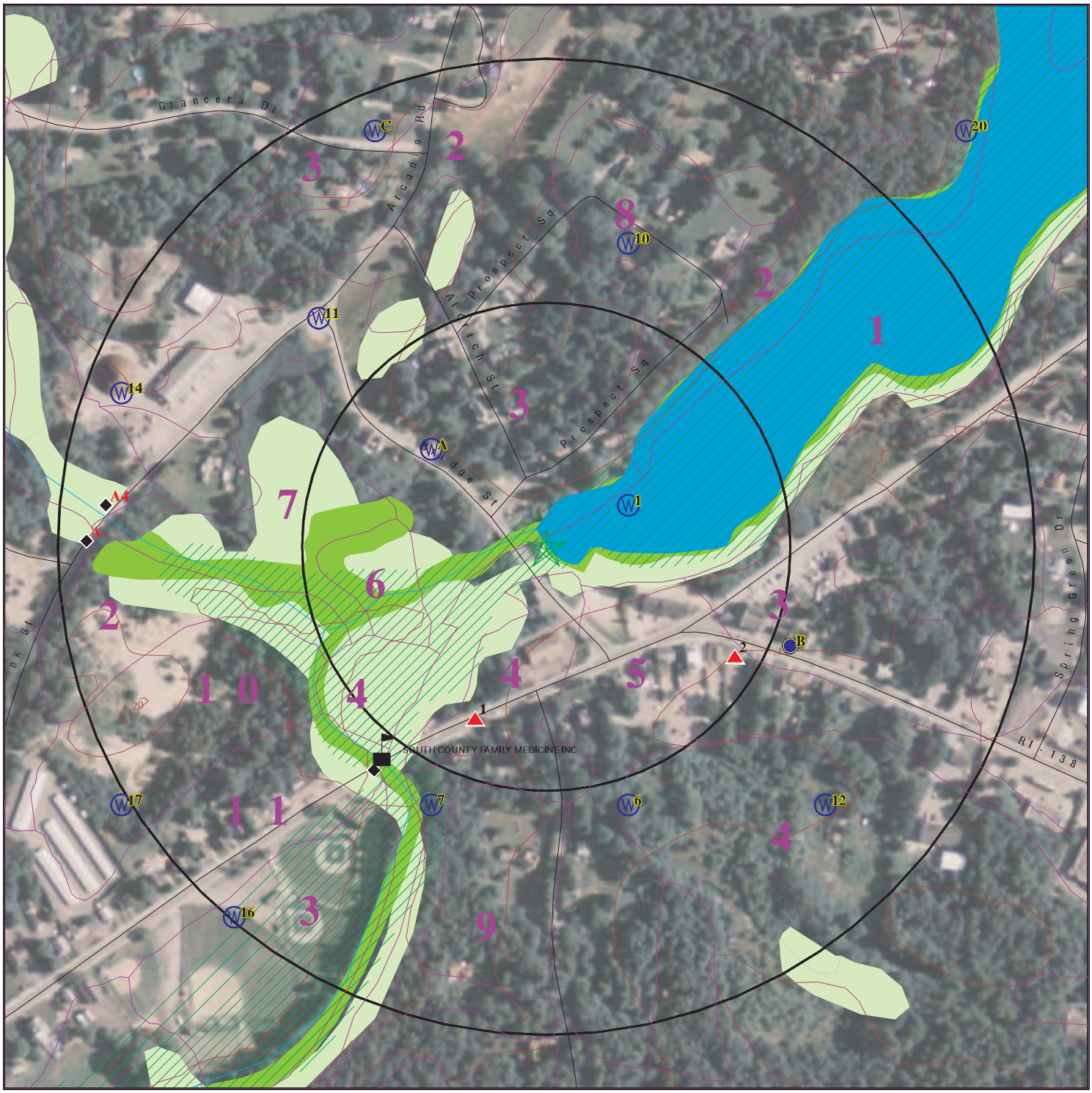
DETAIL MAP - 5380707.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Wyoming Upper Reservoir Dam	CLIENT:	Pare Corporation
ADDRESS:	Bridge St Wyoming RI 02898	CONTACT:	Nathan Meersman
		INQUIRY #:	5380707.2s
LAT/LONG:	41.515904 / 71.703378	DATE:	August 02, 2018 1:05 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	1	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
RI SHWS	1.000		0	0	1	0	NR	1
State and tribal landfill and/or solid waste disposal site lists								
RI SWF/LF	0.500		0	0	0	NR	NR	0
RI LCP	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
RI LUST	0.500		0	1	3	NR	NR	4
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RI UST	0.250		1	2	NR	NR	NR	3
RI AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
RI AUL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
RI BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
RI CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
RI SPILLS	TP		NR	NR	NR	NR	NR	0
RI SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
RI AIRS	TP		NR	NR	NR	NR	NR	0
RI ASBESTOS	TP		NR	NR	NR	NR	NR	0
RI DRYCLEANERS	0.250		0	0	NR	NR	NR	0
RI Financial Assurance	TP		NR	NR	NR	NR	NR	0
RI LEAD	TP		NR	NR	NR	NR	NR	0
RI MANIFEST	0.250		0	1	NR	NR	NR	1
NJ MANIFEST	0.250		0	1	NR	NR	NR	1
RI NPDES	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RI RGA HWS	TP		NR	NR	NR	NR	NR	0
RI RGA LF	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RI RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	2	6	4	0	0	12

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1 SSW < 1/8 0.095 mi. 502 ft.	**HOPE VALLEY TOWING INC 1120 MAIN ST RICHMOND, RI 02898**	**RCRA NonGen / NLR FINDS ECHO**	**1000801612 RID987492329**

Relative:
Higher

Actual:
92 ft.

RCRA NonGen / NLR:

Date form received by agency:	05/21/1992
Facility name:	HOPE VALLEY TOWING INC
Facility address:	1120 MAIN ST RICHMOND, RI 02898
EPA ID:	RID987492329
Mailing address:	PO BOX 32 WYOMING, RI 02898
Contact:	ANTHONY APICE
Contact address:	PO BOX 32 WYOMING, RI 02898
Contact country:	US
Contact telephone:	401-539-3089
Contact email:	Not reported
EPA Region:	01
Land type:	Private
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	BRUCE O BRYANT
Owner/operator address:	MAIN ST WYOMING, RI 02898
Owner/operator country:	Not reported
Owner/operator telephone:	401-539-3089
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Universal Waste Summary:

Waste type:	Batteries

HOPE VALLEY TOWING INC (Continued) **1000801612**

Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Waste type: Lamps
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Waste type: Pesticides
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

Waste type: Thermostats
Accumulated waste on-site: Yes
Generated waste on-site: Not reported

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Facility Has Received Notices of Violations:
Regulation violated: SR - 5.09
Area of violation: Generators - Manifest
Date violation determined: 03/03/1992
Date achieved compliance: 05/21/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/12/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 5.02
Area of violation: Generators - Pre-transport
Date violation determined: 03/03/1992
Date achieved compliance: 05/21/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/12/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 5.01
Area of violation: Generators - General
Date violation determined: 03/03/1992
Date achieved compliance: 05/18/1993

HOPE VALLEY TOWING INC (Continued) **1000801612**

Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/12/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 05/18/1993
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/03/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 05/18/1993
Evaluation lead agency: State

Evaluation date: 03/03/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 05/21/1992
Evaluation lead agency: State

Evaluation date: 03/03/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Manifest
Date achieved compliance: 05/21/1992
Evaluation lead agency: State

FINDS:

Registry ID: 110004931628

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000801612
Registry ID: 110004931628
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110004931628

2
ESE
< 1/8
0.112 mi.
590 ft.

BIG A AUTO PARTS
RICHMOND, RI

RI UST **U001214063**
N/A

Relative:
Higher

Actual:
120 ft.

UST:
Facility ID: UST-16147
Facility Class: Commercials

Tank ID: 1
Tank Status: Permanently Closed
Tank Capacity: 1000
Tank Substance: Gasoline
Date Installed: 04/25/2001

Tank ID: 2
Tank Status: Permanently Closed
Tank Capacity: 3000
Tank Substance: Gasoline
Date Installed: 04/25/2001

Tank ID: 3
Tank Status: Permanently Closed
Tank Capacity: 4000
Tank Substance: Gasoline
Date Installed: 04/25/2001

Tank ID: 4
Tank Status: Permanently Closed
Tank Capacity: 4000
Tank Substance: Gasoline
Date Installed: 04/25/2001

3
SW
1/8-1/4
0.144 mi.
762 ft.

ST. JOSEPH'S CHURCH
1105 MAIN ST
HOPKINTON, RI

RI UST **U001473984**
N/A

Relative:
Lower

Actual:
81 ft.

UST:
Facility ID: UST-16481
Facility Class: Other

Tank ID: 1
Tank Status: Permanently Closed
Tank Capacity: 1000
Tank Substance: Heating Oil No.2
Date Installed: 04/25/2001

A4 West 1/8-1/4 0.227 mi. 1196 ft. | **RI D O T MAINTENANCE DIV**
51 BANK ST
HOPKINTON, RI 02832

RCRA-SQG **1000882904**
NJ MANIFEST **RID987466703**
RI MANIFEST

Site 1 of 3 in cluster A

Relative: Lower

Actual: 84 ft.

RCRA-SQG:

Date form received by agency:	05/17/1988
Facility name:	RI D O T MAINTENANCE DIV
Facility address:	51 BANK ST HOPKINTON, RI 02832
EPA ID:	RID987466703
Mailing address:	CALVERLEY ST PROVIDENCE, RI 02908
Contact:	EVERETT SAMMARTINO
Contact address:	90 CALVERLEY ST PROVIDENCE, RI 02908
Contact country:	US
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	01
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	STATE OF RI-DEPT OF TRANSPORTATION
Owner/operator address:	2 CAPITOL HILL PROVIDENCE, RI 02903
Owner/operator country:	US
Owner/operator telephone:	401-277-2378
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	State
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

RI D O T MAINTENANCE DIV (Continued) **1000882904**

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

NJ MANIFEST:

EPA Id:	RID987466703
Mail Address:	360 LINCOLN AVENUE
Mail City/State/Zip:	WARWICK 02888
Facility Phone:	4016415768
Emergency Phone:	Not reported
Contact:	GRANT OGREN
Comments:	Not reported
SIC Code:	Not reported
County:	00
Municipal:	00
Previous EPA Id:	Not reported
Gen Flag:	X
Trans Flag:	Not reported
TSDF Flag:	Not reported
Name Change:	Not reported
Date Change:	Not reported

Manifest:

Manifest Number:	NJA5207784
EPA ID:	RID987466703
Date Shipped:	12/02/2004
TSDF EPA ID:	NJD002200046
Transporter EPA ID:	NJ0000027193
Transporter 2 EPA ID:	Not reported
Transporter 3 EPA ID:	Not reported
Transporter 4 EPA ID:	Not reported
Transporter 5 EPA ID:	Not reported
Transporter 6 EPA ID:	Not reported
Transporter 7 EPA ID:	Not reported
Transporter 8 EPA ID:	Not reported
Transporter 9 EPA ID:	Not reported
Transporter 10 EPA ID:	Not reported
Date Trans1 Transported Waste:	12/02/2004
Date Trans2 Transported Waste:	Not reported
Date Trans3 Transported Waste:	Not reported
Date Trans4 Transported Waste:	Not reported
Date Trans5 Transported Waste:	Not reported
Date Trans6 Transported Waste:	Not reported
Date Trans7 Transported Waste:	Not reported
Date Trans8 Transported Waste:	Not reported
Date Trans9 Transported Waste:	Not reported
Date Trans10 Transported Waste:	Not reported
Date TSDF Received Waste:	12/15/2004
TSDF EPA Facility Name:	Not reported
QTY Units:	Not reported
Transporter SEQ ID:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Transporter-1 Date:	Not reported
Waste SEQ ID:	Not reported
Waste Type Code 2:	Not reported
Waste Type Code 3:	Not reported
Waste Type Code 4:	Not reported
Waste Type Code 5:	Not reported
Waste Type Code 6:	Not reported
Date Accepted:	Not reported
Manifest Discrepancy Type:	Not reported
Data Entry Number:	03150595
Was Load Rejected:	WARWICK 02888
Reason Load Was Rejected:	Not reported

RI MANIFEST:

EPA Id:	RID987466703
GEN Cert Date:	12/5/1988
Manifest Document Number:	RIG0001835
Waste Description:	PET NAP
TSDF Id:	RID084802842
TSDF Name:	CHEM PAK
Qty:	15
WT/Vol Units:	G
TSDF Date:	Not reported
Transporter 2 Id:	Not reported
Item Number:	1
Transporter 2 Name:	Not reported
Transporter Name 2:	CYCLE SOLVE CORPORATION
Transporter EPAID:	RID982194987
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Fee Exempt Code:	Not reported
Comment:	Not reported
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
Quarter:	Not reported
Transporter Contact Name:	Not reported
Transporter Contact Email:	Not reported
Filing Date:	Not reported
Total Fee:	Not reported
Billing Name:	Not reported
Paid Date:	Not reported
Paid Time:	Not reported
Facility Receipt Date:	Not reported
Fee:	Not reported
Manifest Created Date:	Not reported
Manifest Updated Date:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

RI MANIFEST:

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	Not reported
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	RIH0012250
Quarter:	Not reported
Waste Description:	WASTE GASOLINE AND WATER
Transporter Contact Name:	Not reported
Quantity:	35
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	2465
Transporter Name:	LINCOLN ENVIRONMENTAL
Billing Name:	Not reported
Transporter EPA ID:	RID982192627
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	1/18/2002
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	Not reported
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	RIH0012250
Quarter:	Not reported
Waste Description:	WASTE GASOLINE AND WATER
Transporter Contact Name:	Not reported
Quantity:	35
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	2465
Transporter Name:	LINCOLN ENVIRONMENTAL
Billing Name:	Not reported
Transporter EPA ID:	RID982192627
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	1/18/2002
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	RIS0050627
Quarter:	Not reported
Waste Description:	WASTE GASOLINE AND WATER
Transporter Contact Name:	Not reported
Quantity:	55
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	7749
Transporter Name:	LINCOLN ENVIRONMENTAL
Billing Name:	Not reported
Transporter EPA ID:	RID982192627
Date Paid:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Time Paid:	Not reported
GEN Cert Date:	1/5/2001
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	RIS0050627
Quarter:	Not reported
Waste Description:	WASTE GASOLINE AND WATER
Transporter Contact Name:	Not reported
Quantity:	55
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	7749
Transporter Name:	LINCOLN ENVIRONMENTAL
Billing Name:	Not reported
Transporter EPA ID:	RID982192627
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	1/5/2001
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	NONE
Waste Code2:	Not reported
Waste Code3:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	B/L 9547
Quarter:	Not reported
Waste Description:	WASTE OILY SOLIDS, NON RCRA REGULATED
Transporter Contact Name:	Not reported
Quantity:	700
Transporter Contact Email:	Not reported
WT/Vol Units:	p
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	9390
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	6/9/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	NONE
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	B/L 9547
Quarter:	Not reported
Waste Description:	WASTE OILY SOLIDS, NON RCRA REGULATED
Transporter Contact Name:	Not reported
Quantity:	700

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Transporter Contact Email:	Not reported
WT/Vol Units:	p
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	9390
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	6/9/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	MA01
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	C Y N OIL CORP
TSDF Id:	MAD082303777
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	MAK028404
Quarter:	Not reported
Waste Description:	OIL SOL
Transporter Contact Name:	Not reported
Quantity:	15
Transporter Contact Email:	Not reported
WT/Vol Units:	Y
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	LOGANO TRANS CO INC
Billing Name:	Not reported
Transporter EPA ID:	CTD983896341
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	10/27/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	MA01
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	C Y N OIL CORP
TSDF Id:	MAD082303777
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	MAK028402
Quarter:	Not reported
Waste Description:	OIL SOL
Transporter Contact Name:	Not reported
Quantity:	15
Transporter Contact Email:	Not reported
WT/Vol Units:	Y
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	LOGANO TRANS CO INC
Billing Name:	Not reported
Transporter EPA ID:	CTD983896341
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	10/23/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	MA01
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	C Y N OIL CORP
TSDF Id:	MAD082303777

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	MAK028403
Quarter:	Not reported
Waste Description:	OIL SOL
Transporter Contact Name:	Not reported
Quantity:	15
Transporter Contact Email:	Not reported
WT/Vol Units:	Y
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	LOGANO TRANS CO INC
Billing Name:	Not reported
Transporter EPA ID:	CTD983896341
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	10/20/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	MA01
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	C Y N OIL CORP
TSDF Id:	MAD082303777
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	MAH457691
Quarter:	Not reported
Waste Description:	OIL SOL
Transporter Contact Name:	Not reported
Quantity:	30
Transporter Contact Email:	Not reported
WT/Vol Units:	Y
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	LOGANO TRANS CO INC
Billing Name:	Not reported

RI D O T MAINTENANCE DIV (Continued) **1000882904**

Transporter EPA ID:	CTD983896341
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	10/30/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	NONE
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987466703
Manifest Docket Number:	MAK043186-
Quarter:	Not reported
Waste Description:	WASTE OILY SOLIDS, NON RCRA REGULATED
Transporter Contact Name:	Not reported
Quantity:	300
Transporter Contact Email:	Not reported
WT/Vol Units:	p
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	11218
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	7/8/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Click this hyperlink while viewing on your computer to access
82 additional RI_MANIFEST: record(s) in the EDR Site Report.

A5 West 1/8-1/4 0.235 mi. 1242 ft. | **HOPE VALLEY GARAGE (D.O.T.)** | **RI UST** | **U003207663** **N/A**

51 BANK ST
HOPKINTON, RI

Site 2 of 3 in cluster A

Relative: Lower

Actual: 83 ft.

UST:

Facility ID: UST-1280
Facility Class: State Government

Tank ID: 1
Tank Status: Permanently Closed
Tank Capacity: 5000
Tank Substance: Gasoline
Date Installed: 05/01/1977

Tank ID: 2
Tank Status: Permanently Closed
Tank Capacity: 10000
Tank Substance: Gasoline
Date Installed: 05/01/1973

Tank ID: 3
Tank Status: Permanently Closed
Tank Capacity: 3000
Tank Substance: Diesel
Date Installed: 05/01/1967

Tank ID: 4
Tank Status: Permanently Closed
Tank Capacity: 10000
Tank Substance: Gasoline
Date Installed: 09/01/1986

Tank ID: 5
Tank Status: Permanently Closed
Tank Capacity: 6000
Tank Substance: Diesel
Date Installed: 09/01/1986

Tank ID: 6
Tank Status: Permanently Closed
Tank Capacity: 2000
Tank Substance: Gasoline
Date Installed: 04/25/2001

Tank ID: 7
Tank Status: Permanently Closed
Tank Capacity: 2000
Tank Substance: Gasoline
Date Installed: 04/25/2001

HOPE VALLEY GARAGE (D.O.T.) (Continued) **U003207663**

Tank ID: 8
Tank Status: In Use
Tank Capacity: 4000
Tank Substance: Heating Oil No.2
Date Installed: 04/25/2001

Tank ID: 9
Tank Status: Permanently Closed
Tank Capacity: 1000
Tank Substance: Gasoline
Date Installed: 04/25/2001

A6
West
1/8-1/4
0.235 mi.
1242 ft.

RI DOT GARAGE **RI LUST** **S105077940**
51 BANK STREET **N/A**
HOPKINTON, RI

Site 3 of 3 in cluster A

Relative:
Lower

Actual:
83 ft.

LUST:
Project Number: 1406-LS
Project Date: 01/01/1992
Facility Id: 1280
Fstatus Decode: Inactive; Investigation/Remed. Complete, No Further Action Required
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required

---

7
SW
1/4-1/2
0.405 mi.
2138 ft.

DOWNTOWN AUTO REPAIR **RI LUST** **1004779430**
1100 MAIN ST **RCRA NonGen / NLR** **RID987469327**
HOPKINTON, RI 02832 **RI MANIFEST**

Relative:
Higher

Actual:
95 ft.

LUST:
Project Number: 1415-LS
Project Date: 10/21/2015
Facility Id: 16078
Fstatus Decode: Soil Removal Only; No Further Action Required
Facility Status: Soil Removal Only; No Further Action Required

RCRA NonGen / NLR:
Date form received by agency: 04/24/2017
Facility name: DOWNTOWN AUTO REPAIR
Facility address: 1100 MAIN ST
HOPKINTON, RI 02832
EPA ID: RID987469327
Mailing address: MAIN ST
HOPKINTON, RI 02832
Contact: KEVIN MOON
Contact address: MAIN ST
HOPKINTON, RI 02832
Contact country: US
Contact telephone: 401-491-9200
Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Non-Generator

DOWNTOWN AUTO REPAIR (Continued) **1004779430**

Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	DOWNTOWN AUTO REPAIR
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	DENNIS ALLESANDRO
Owner/operator address:	OWNERSTREET
	OWNERCITY, RI 99999
Owner/operator country:	Not reported
Owner/operator telephone:	401-555-1212
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	11/21/1989
Site name:	CHARIHO AUTO SALES
Classification:	Small Quantity Generator

. Waste code:	D001
. Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET,

DOWNTOWN AUTO REPAIR (Continued) **1004779430**

WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 04/24/2017
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

RI MANIFEST:
EPA Id: RID987469327
GEN Cert Date: 4/17/1990
Manifest Document Number: RIG0007173
Waste Description: PET NAP
TSDF Id: RID084802842
TSDF Name: CHEM PAK
Qty: 9
WT/Vol Units: G
TSDF Date: Not reported
Transporter 2 Id: Not reported
Item Number: 1
Transporter 2 Name: Not reported
Transporter Name 2: CYCLE SOLVE CORPORATION
Transporter EPAID: RID982194987
Transporter Receipt Date: Not reported
Number Of Containers: 0
Container Type: Not reported
Waste Code1: D001
Waste Code2: Not reported
Waste Code3: Not reported
Waste Code4: Not reported
Waste Code5: Not reported
Waste Code6: Not reported
Fee Exempt Code: Not reported
Comment: Not reported
Transporter Name 2: Not reported
Company Permit Number: Not reported
Year: Not reported
Quarter: Not reported
Transporter Contact Name: Not reported
Transporter Contact Email: Not reported
Filing Date: Not reported
Total Fee: Not reported
Billing Name: Not reported
Paid Date: Not reported
Paid Time: Not reported
Facility Receipt Date: Not reported
Fee: Not reported
Manifest Created Date: Not reported
Manifest Updated Date: Not reported

RI MANIFEST:
Transporter Receipt Date: Not reported
Number Of Containers: 0

DOWNTOWN AUTO REPAIR (Continued) **1004779430**

Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	CHEM PAK
TSDF Id:	RID084802842
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987469327
Manifest Docket Number:	RIG0008222
Quarter:	Not reported
Waste Description:	PET NAP
Transporter Contact Name:	Not reported
Quantity:	10
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	CYCLE SOLVE CORPORATION
Billing Name:	Not reported
Transporter EPA ID:	RID982194987
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	6/28/1990
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	CHEM PAK
TSDF Id:	RID084802842
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987469327
Manifest Docket Number:	RIG0007173

DOWNTOWN AUTO REPAIR (Continued) **1004779430**

Quarter:	Not reported
Waste Description:	PET NAP
Transporter Contact Name:	Not reported
Quantity:	9
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	CYCLE SOLVE CORPORATION
Billing Name:	Not reported
Transporter EPA ID:	RID982194987
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	4/17/1990
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	CHEM PAK
TSDF Id:	RID084802842
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987469327
Manifest Docket Number:	RIG0007173
Quarter:	Not reported
Waste Description:	PET NAP
Transporter Contact Name:	Not reported
Quantity:	9
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	CYCLE SOLVE CORPORATION
Billing Name:	Not reported
Transporter EPA ID:	RID982194987
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	4/17/1990
Facility Receipt Date:	Not reported

DOWNTOWN AUTO REPAIR (Continued) **1004779430**

Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	CHEM PAK
TSDF Id:	RID084802842
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987469327
Manifest Docket Number:	RIG0008222
Quarter:	Not reported
Waste Description:	PET NAP
Transporter Contact Name:	Not reported
Quantity:	10
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	CYCLE SOLVE CORPORATION
Billing Name:	Not reported
Transporter EPA ID:	RID982194987
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	6/28/1990
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

8
ESE
1/4-1/2
0.442 mi.
2336 ft.

EXXON STATION
1209 MAIN STREET
RICHMOND, RI

RI LUST **S105062027**
RI SPILLS **N/A**

Relative:
Higher

Actual:
129 ft.

LUST:
Project Number: 2903-LS
Project Date: 01/16/1991
Facility Id: 1257
Fstatus Decode: Inactive; Investigation/Remed. Complete, No Further Action Required
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required

SPILLS:
Report Number: Not reported
Report Date: Not reported
Material Spilled: Not reported
Inspector: Not reported
Source: Not reported
Complaint Number: 15675
Complaint Date: 11/07/2000
Inspect ID: 12477
Inspection Date: 11/07/2000
Founded: Y
Amount Spilled: 8
Units Spilled: Gallons
Nature Of Spill: Not reported
Nature Of Spill 2: Not reported

9
WSW
1/4-1/2
0.472 mi.
2494 ft.

WOODMANSEE H C SON INC
8 FAIRVIEW AVE
HOPKINTON, RI 02832

RI SHWS **1000190375**
RI LUST **RID987471331**
RCRA NonGen / NLR
RI MANIFEST

Relative:
Higher

Actual:
103 ft.

SHWS:
Project Code: HCWS-HWM
Siterem Site Number: SR-14-0574
Facility Status: Inactive
Project Code Desc: HCWS-HWM
Project Date: 10/10/2001

LUST:
Project Number: 1413-LS
Project Date: 06/24/1999
Facility Id: 18624
Fstatus Decode: Inactive; Investigation/Remed. Complete, No Further Action Required
Facility Status: Inactive; Investigation/Remed. Complete,No Further Action Required

RCRA NonGen / NLR:
Date form received by agency: 06/28/2016
Facility name: WOODMANSEE H C SON INC
Facility address: 8 FAIRVIEW AVE
HOPKINTON, RI 02832
EPA ID: RID987471331
Mailing address: PO BOX 328
HOPE VALLEY, RI 02832
Contact: CLIFTON WOODMANSEE

WOODMANSEE H C SON INC (Continued) **1000190375**

Contact address: 2 MECHANIC ST PO BOX 329
HOPE VALLEY, RI 02832
Contact country: US
Contact telephone: 401-539-2425
Contact email: Not reported
EPA Region: 01
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: CLIFTON WOODMANSEE
Owner/operator address: OWNERSTREET
OWNERCITY, RI 99999
Owner/operator country: Not reported
Owner/operator telephone: 401-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Historical Generators:
Date form received by agency: 03/15/1990
Site name: WOODMANSEE H C SON INC
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF

WOODMANSEE H C SON INC (Continued) **1000190375**

LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

RI MANIFEST:

EPA Id:	RID987471331
GEN Cert Date:	4/6/1998
Manifest Document Number:	MAK042654
Waste Description:	HALOGENATED OIL
TSDF Id:	RID040098352
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
Qty:	430
WT/Vol Units:	G
TSDF Date:	Not reported
Transporter 2 Id:	Not reported
Item Number:	6704
Transporter 2 Name:	Not reported
Transporter Name 2:	Western Oil
Transporter EPAID:	RID980906580
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	F001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Fee Exempt Code:	Not reported
Comment:	Not reported
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
Quarter:	Not reported
Transporter Contact Name:	Not reported
Transporter Contact Email:	Not reported
Filing Date:	Not reported
Total Fee:	Not reported
Billing Name:	Not reported
Paid Date:	Not reported
Paid Time:	Not reported
Facility Receipt Date:	Not reported
Fee:	Not reported
Manifest Created Date:	Not reported
Manifest Updated Date:	Not reported

RI MANIFEST:

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	CR02
Waste Code2:	Not reported
Waste Code3:	Not reported

WOODMANSEE H C SON INC (Continued) **1000190375**

Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	BRIDGEPORT UNITED RECYCLING IN
TSDF Id:	CTD002593887
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	RIH0014954
Quarter:	Not reported
Waste Description:	OILS
Transporter Contact Name:	Not reported
Quantity:	50
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	WESTERN OIL
Billing Name:	Not reported
Transporter EPA ID:	RIR000500025
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	12/12/2000
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	CR02
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	BRIDGEPORT UNITED RECYCLING IN
TSDF Id:	CTD002593887
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	RIH0014954
Quarter:	Not reported
Waste Description:	OILS
Transporter Contact Name:	Not reported
Quantity:	50

WOODMANSEE H C SON INC (Continued) **1000190375**

Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	1
Transporter Name:	WESTERN OIL
Billing Name:	Not reported
Transporter EPA ID:	RIR000500025
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	12/12/2000
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	MAK014568
Quarter:	Not reported
Waste Description:	PARTS CLEANER
Transporter Contact Name:	Not reported
Quantity:	40
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	4000
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	3/27/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported

WOODMANSEE H C SON INC (Continued) **1000190375**

Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	F001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	MAK042654
Quarter:	Not reported
Waste Description:	HALOGENATED OIL
Transporter Contact Name:	Not reported
Quantity:	430
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	6704
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	4/6/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352

WOODMANSEE H C SON INC (Continued) **1000190375**

Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	MAK014568
Quarter:	Not reported
Waste Description:	PARTS CLEANER
Transporter Contact Name:	Not reported
Quantity:	40
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	4000
Transporter Name:	Western Oil
Billing Name:	Not reported
Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	3/27/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	F001
Waste Code2:	Not reported
Waste Code3:	Not reported
Waste Code4:	Not reported
Waste Code5:	Not reported
Waste Code6:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Id:	RID040098352
Transporter Name 2:	Not reported
Company Permit Number:	Not reported
Year:	Not reported
EPA ID:	RID987471331
Manifest Docket Number:	MAK042654
Quarter:	Not reported
Waste Description:	HALOGENATED OIL
Transporter Contact Name:	Not reported
Quantity:	430
Transporter Contact Email:	Not reported
WT/Vol Units:	G
Filing Date:	Not reported
Total Fee:	Not reported
Item Number:	6704
Transporter Name:	Western Oil
Billing Name:	Not reported

WOODMANSEE H C SON INC (Continued) **1000190375**

Transporter EPA ID:	RID980906580
Date Paid:	Not reported
Time Paid:	Not reported
GEN Cert Date:	4/6/1998
Facility Receipt Date:	Not reported
Fee:	Not reported
Transporter 2 Receipt Date:	Not reported
Manifest Created Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported
Manifest Updated Date:	Not reported

Count: 4 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
RICHMOND	S109823815	RICHMOND ELEMENTARY SCHOOL	190 KINGSTOWN ROAD (ROUTE 138)		RI SHWS
RICHMOND	S105077961	DB MART - RT 138	1190 MAIN STREET		RI LUST
RICHMOND	S102068398	MOBIL STATION	1241 MAIN STREET		RI LUST
RICHMOND	S106664297	CHARIHO REGIONAL VOCATIONAL SCHOOL	WOOD RIVER JUNCTION		RI SHWS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 23

Source: EPA
Telephone: N/A
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 23

Source: EPA
Telephone: N/A
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 05/13/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: N/A
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/15/2018
	Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/05/2017	Telephone: 703-603-8704
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 07/06/2018
Number of Days to Update: 92	Next Scheduled EDR Contact: 10/15/2018
	Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 05/18/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: 800-424-9346
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/29/2018
	Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 05/18/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 23

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/14/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/09/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/13/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/29/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/13/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/29/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/19/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 73

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: List of CERCLIS and State Sites in RI

This list includes sites that have been investigated under the Federal CERCLIS program (SFA sites) as well as sites that have notified under the state program or have been investigated for hazardous substances (HWM sites).

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/05/2018
Number of Days to Update: 54

Source: Department of Environmental Management
Telephone: 401-222-3872
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 56

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

LCP: Landfill Closure Program Sites in RI

This inventory contains both formerly permitted landfills that are closed as well as dumps that were never licensed by the Department. This list does not include Superfund Sites and current or former Federal Facilities. This list includes lat/long data that has not been field verified.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 56

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LUST: LUST Case List

The LUST Case List is a summary of UST Facilities in RI with leaking USTs, which includes information on the date of release discovery and the status of the LUST Case (active, soil removal only, or inactive).

Date of Government Version: 04/05/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 56

Source: Department of Environmental Management
Telephone: 401-222-3872
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Varies

UST: UST Master List
The UST Master List is a summary of registered UST Facilities in RI, which includes information on abandoned, in use, permanently closed and temporarily closed USTs.

Date of Government Version: 04/05/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 56

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Quarterly

AST: Aboveground Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 09/06/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/02/2017
Number of Days to Update: 11

Source: Department of Environmental Management
Telephone: 401-222-3872
Last EDR Contact: 05/11/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

AUL: Waste Management Sites with Environmental Land Use Restrictions
This list was developed by RIDEM for use as a general reference and are not meant to be legally authoritative source for the location of hazardous materials, nor for the status, condition or permissible use of a site.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/05/2018
Number of Days to Update: 54

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 06/22/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Site List
Brownfields are real properties where the expansion, redevelopment or reuse may be complicated by the actual or potential presence of a hazardous substance, pollutant, or contaminat.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 04/12/2018
Date Made Active in Reports: 06/05/2018
Number of Days to Update: 54

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/19/2018
Date Data Arrived at EDR: 03/21/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/20/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/30/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 05/04/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 71

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Lab Information Listing
A listing of clandestine drug lab site locations.

Date of Government Version: 10/03/2006
Date Data Arrived at EDR: 12/04/2006
Date Made Active in Reports: 12/18/2006
Number of Days to Update: 14

Source: Dept of Environmental Management
Telephone: 401-274-4400
Last EDR Contact: 06/01/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 71

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 30

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 73

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

SPILLS: Oil & Hazardous Material Response Log/Spill Report

Spills reported to the Office of Emergency Response.

Date of Government Version: 11/15/2004
Date Data Arrived at EDR: 02/04/2005
Date Made Active in Reports: 03/24/2005
Number of Days to Update: 48

Source: Dept. of Environmental Management
Telephone: 401-222-3872
Last EDR Contact: 06/20/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 01/04/2001
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/25/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/15/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/08/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/22/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/25/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 30

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/20/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 07/09/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/23/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 06/07/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/04/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/03/2018
Date Data Arrived at EDR: 04/05/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/05/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 03/31/2018
Date Data Arrived at EDR: 04/16/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 74

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/09/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 30

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 05/03/2018
Date Data Arrived at EDR: 05/31/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 29

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 03/13/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 87

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/20/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/21/2018
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 28

Source: EPA
Telephone: (617) 918-1111
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2016
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 73

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 06/01/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 02/25/2018
Date Data Arrived at EDR: 03/17/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 30

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/23/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Quarterly

AIRS: Air Emissions Listing
A listing of facilities with air emissions.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 09/06/2016
Date Made Active in Reports: 12/12/2016
Number of Days to Update: 97

Source: Department of Environmental Management
Telephone: 401-222-2808
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

ASBESTOS: Asbestos Notification Listing
Asbestos notification sites

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/03/2018
Number of Days to Update: 27

Source: Department of Health
Telephone: 401-222-7756
Last EDR Contact: 07/20/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner Facility Listing
A listing of drycleaner locations.

Date of Government Version: 01/31/2018
Date Data Arrived at EDR: 05/09/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 29

Source: Department of Environmental Management
Telephone: 401-222-2808
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Annually

Financial Assurance: Financial Assurance Information
Financial assurance information for hazardous waste facilities.

Date of Government Version: 05/19/2014
Date Data Arrived at EDR: 05/20/2014
Date Made Active in Reports: 06/24/2014
Number of Days to Update: 35

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 07/25/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

LEAD: Lead Inspections Database
The listing includes Highest Risk Premises which are properties declared unsafe for habitation by children under age six (6), and Properties with Multiple Poisonings, which are properties that have been the source of multiple lead poisonings and are not currently lead safe.

Date of Government Version: 03/19/2018
Date Data Arrived at EDR: 03/22/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 18

Source: Department of Health, Environmental Lead Program
Telephone: 401-222-5960
Last EDR Contact: 06/21/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Quarterly

LEAD CERT: Lead Safe Housing Registry
Properties with Active "Lead Free", "Lead Safe", "Acceptable Dust" and "Annual Re-inspection" certificates.

Date of Government Version: 05/07/2018
Date Data Arrived at EDR: 05/09/2018
Date Made Active in Reports: 07/03/2018
Number of Days to Update: 55

Source: Department of Health
Telephone: 401-222-7791
Last EDR Contact: 06/01/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Semi-Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/21/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Annually

NPDES: Permit and Facility Data
A listing of permitted wastewater facilities

Date of Government Version: 05/30/2018
Date Data Arrived at EDR: 06/01/2018
Date Made Active in Reports: 07/03/2018
Number of Days to Update: 32

Source: Department of Environmental Management
Telephone: 401-222-4700
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Semi-Annually

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List
The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Management in Rhode Island.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/08/2014
Number of Days to Update: 191

Source: Department of Environmental Management
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Management in Rhode Island.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 200

Source: Department of Environmental Management
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Management in Rhode Island.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Management
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 01/03/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/22/2018
Number of Days to Update: 36

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 08/01/2018
Number of Days to Update: 19

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 04/30/2018
Date Data Arrived at EDR: 05/03/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 35

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data
Hazardous waste manifest information.

Date of Government Version: 05/16/2018
Date Data Arrived at EDR: 05/23/2018
Date Made Active in Reports: 07/03/2018
Number of Days to Update: 41

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 07/16/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 24

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/11/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Day Care Provider Listing
Source: Department of Children, Youth & Families
Telephone: 401-528-3624

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: US Fish & Wildlife Service
Telephone: 703-358-2171

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

WYOMING UPPER RESERVOIR DAM
BRIDGE ST
WYOMING, RI 02898

TARGET PROPERTY COORDINATES

Latitude (North):	41.515904 - 41˚ 30' 57.25''
Longitude (West):	71.703378 - 71˚ 42' 12.16''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	274407.3
UTM Y (Meters):	4599346.0
Elevation:	92 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5642171 HOPE VALLEY, RI
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

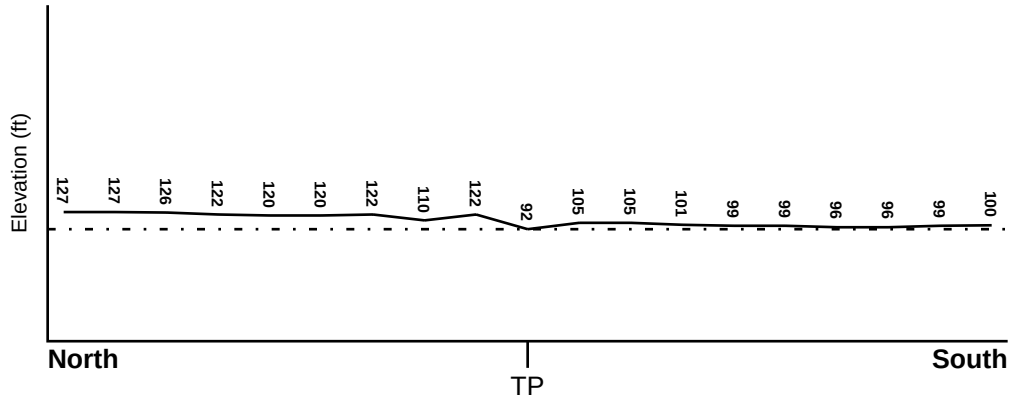
TOPOGRAPHIC INFORMATION

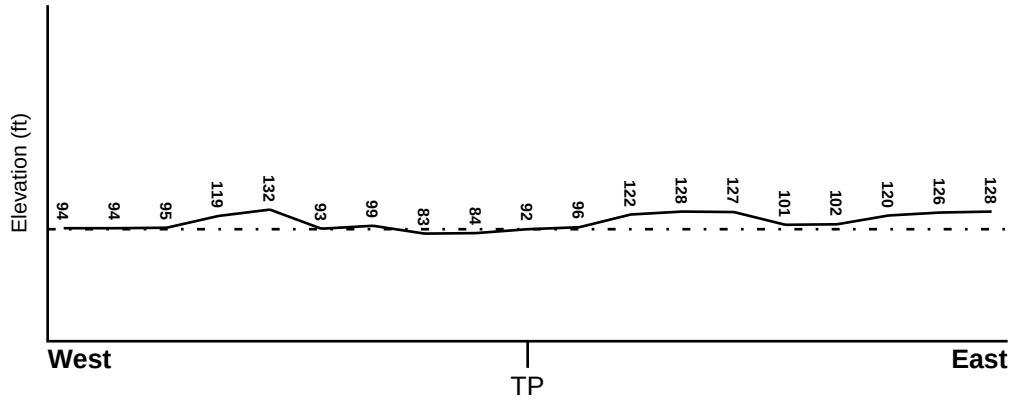
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

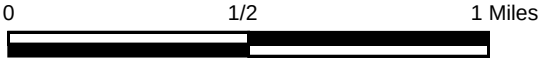
General Topographic Gradient: General WSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 92 ft.



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
44009C0064H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
44009C0065H	FEMA FIRM Flood data
44009C0068H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
HOPE VALLEY	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

EPA DESIGNATED SOLE SOURCE AQUIFER

PAWCATUCK

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

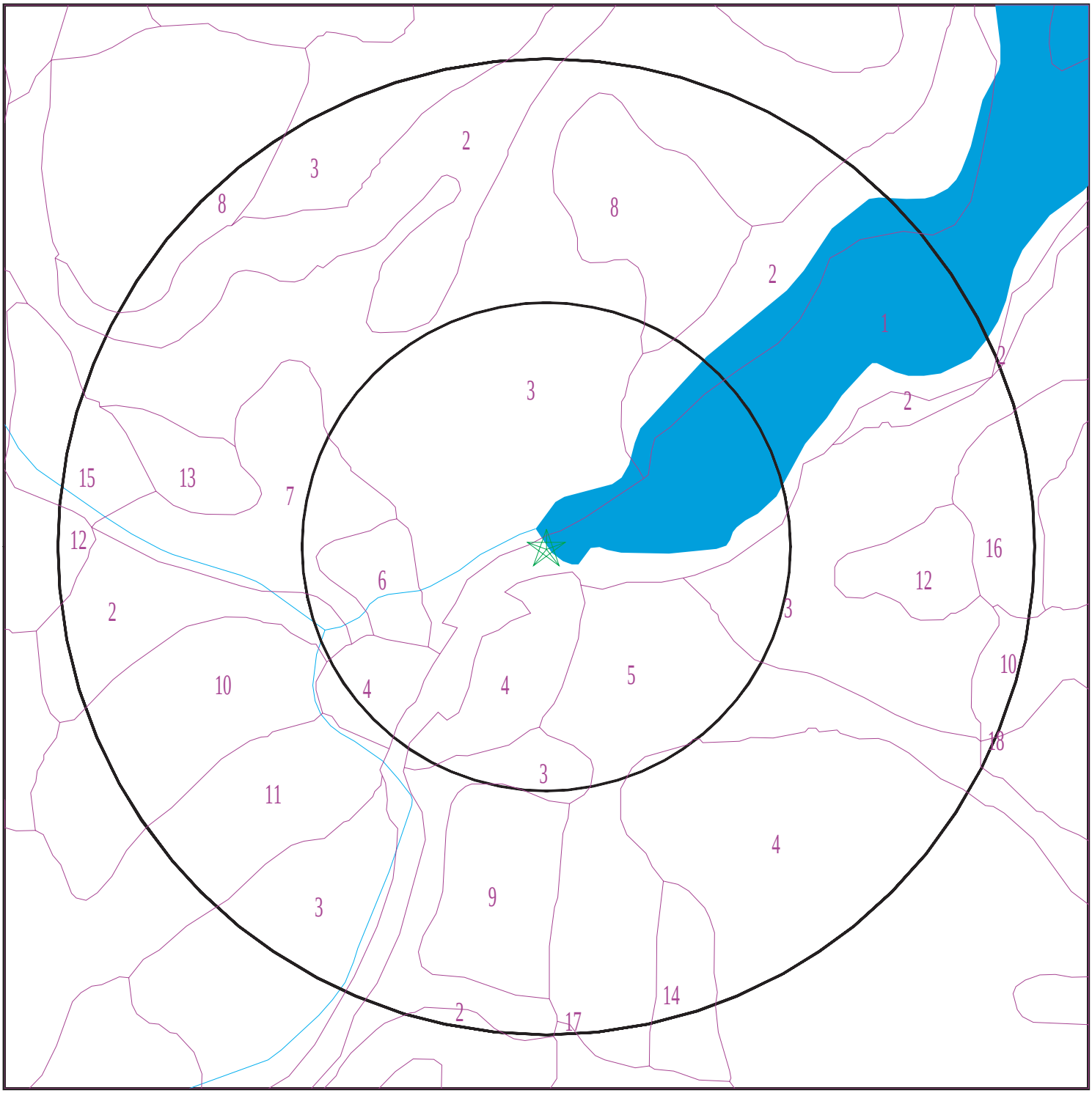
Era:	Precambrian
System:	Precambrian
Series:	Z ganitic rocks
Code:	Zg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5380707.2s



Target Property

SSURGO Soil

Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Wyoming Upper Reservoir Dam	CLIENT:	Pare Corporation
ADDRESS:	Bridge St Wyoming RI 02898	CONTACT:	Nathan Meersman
		INQUIRY #:	5380707.2s
LAT/LONG:	41.515904 / 71.703378	DATE:	August 02, 2018 1:07 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Water

Soil Surface Texture:
Hydrologic Group: Not reported

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 2

Soil Component Name: Hinckley

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6
2	9 inches	16 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6
3	16 inches	59 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6

Soil Map ID: 3

Soil Component Name: Hinckley

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6
2	9 inches	16 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6
3	16 inches	59 inches		Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6

Soil Map ID: 4

Soil Component Name: Canton

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 5 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	3 inches	22 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	22 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 5

Soil Component Name: Canton

Soil Surface Texture:

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	3 inches	22 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	22 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 6

Soil Component Name: Pootatuck

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5
2	11 inches	37 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5
3	37 inches	64 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5

Soil Map ID: 7

Soil Component Name: Adrian

Soil Surface Texture:
Hydrologic Group: Class A/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: Min:
2	20 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: Min:

Soil Map ID: 8

Soil Component Name: Enfield

Soil Surface Texture:

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
2	7 inches	25 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
3	25 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5

Soil Map ID: 9

Soil Component Name: Merrimac

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	11 inches	25 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	25 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 10

Soil Component Name: Udorthents

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	11 inches	25 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	25 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 11

Soil Component Name: Urban land

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches		Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:

Soil Map ID: 12

Soil Component Name: Pits

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class:

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 13

Soil Component Name: Sudbury

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	5 inches	20 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	20 inches	27 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
4	27 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 14

Soil Component Name: Canton

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	3 inches	22 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	22 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 15

Soil Component Name: Scarboro

Soil Surface Texture: mucky sandy loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 13 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	mucky sandy loam	Not reported	Not reported	Max: 705 Min: 42	Max: 6 Min: 4.5
2	5 inches	24 inches	loamy sand	Not reported	Not reported	Max: 705 Min: 42	Max: 6 Min: 4.5

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	24 inches	59 inches	coarse sand	Not reported	Not reported	Max: 705 Min: 42	Max: 6 Min: 4.5

Soil Map ID: 16

Soil Component Name: Bridgehampton

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
2	7 inches	40 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
3	40 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5

Soil Map ID: 17

Soil Component Name: Narragansett

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches		Not reported	Not reported	Max: 141.14 Min: 14.11	Max: 6 Min: 3.6
2	7 inches	33 inches		Not reported	Not reported	Max: 141.14 Min: 14.11	Max: 6 Min: 3.6
3	33 inches	59 inches		Not reported	Not reported	Max: 141.14 Min: 14.11	Max: 6 Min: 3.6

Soil Map ID: 18

Soil Component Name: Urban land

Soil Surface Texture:
Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40001048219	0 - 1/8 Mile ENE
A2	USGS40001048220	0 - 1/8 Mile WNW
A3	USGS40001048235	0 - 1/8 Mile NW
B4	USGS40001048208	0 - 1/8 Mile ESE
6	USGS40001048199	1/8 - 1/4 Mile SSE
7	USGS40001048200	1/8 - 1/4 Mile SSW
B8	USGS40001048207	1/8 - 1/4 Mile ESE
B9	USGS40001048206	1/8 - 1/4 Mile ESE
10	USGS40001048252	1/8 - 1/4 Mile NNE
11	USGS40001048242	1/8 - 1/4 Mile NW
12	USGS40001048198	1/8 - 1/4 Mile SE
C13	USGS40001048259	1/8 - 1/4 Mile NNW
14	USGS40001048236	1/8 - 1/4 Mile WNW
C15	USGS40001048260	1/8 - 1/4 Mile NNW
16	USGS40001048179	1/8 - 1/4 Mile SW
17	USGS40001048201	1/4 - 1/2 Mile WSW
18	USGS40001048215	1/4 - 1/2 Mile East
19	USGS40001048270	1/4 - 1/2 Mile North
20	USGS40001048258	1/4 - 1/2 Mile NE
21	USGS40001048203	1/4 - 1/2 Mile WSW
22	USGS40001048197	1/4 - 1/2 Mile ESE
23	USGS40001048251	1/4 - 1/2 Mile ENE
D24	USGS40001048218	1/4 - 1/2 Mile East
E25	USGS40001048205	1/4 - 1/2 Mile East
E26	USGS40001048196	1/4 - 1/2 Mile ESE
D27	USGS40001048212	1/4 - 1/2 Mile East
28	USGS40001048167	1/4 - 1/2 Mile SW
F29	USGS40001048178	1/4 - 1/2 Mile ESE
F30	USGS40001048187	1/4 - 1/2 Mile ESE
31	USGS40001048298	1/4 - 1/2 Mile North
F32	USGS40001048172	1/4 - 1/2 Mile ESE
F33	USGS40001048189	1/4 - 1/2 Mile ESE
G34	USGS40001048249	1/4 - 1/2 Mile ENE
G35	USGS40001048250	1/4 - 1/2 Mile ENE
E36	USGS40001048195	1/4 - 1/2 Mile ESE
37	USGS40001048299	1/4 - 1/2 Mile NNW
F38	USGS40001048177	1/4 - 1/2 Mile ESE
39	USGS40001048161	1/4 - 1/2 Mile SE
F40	USGS40001048186	1/4 - 1/2 Mile ESE
H41	USGS40001048194	1/4 - 1/2 Mile ESE
H42	USGS40001048193	1/4 - 1/2 Mile ESE

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
H43	USGS40001048185	1/4 - 1/2 Mile ESE
44	USGS40001048148	1/4 - 1/2 Mile SE
H45	USGS40001048192	1/4 - 1/2 Mile ESE
46	USGS40001048159	1/2 - 1 Mile SE
47	USGS40001048170	1/2 - 1 Mile ESE
48	USGS40001048152	1/2 - 1 Mile SW
I49	USGS40001048327	1/2 - 1 Mile North
50	USGS40001048257	1/2 - 1 Mile ENE
I51	USGS40001048329	1/2 - 1 Mile North
J52	USGS40001048223	1/2 - 1 Mile West
J53	USGS40001048222	1/2 - 1 Mile West
J54	USGS40001048221	1/2 - 1 Mile West
55	USGS40001048328	1/2 - 1 Mile NNE
K56	USGS40001048149	1/2 - 1 Mile SW
K57	USGS40001048153	1/2 - 1 Mile WSW
L58	USGS40001048334	1/2 - 1 Mile North
L59	USGS40001048333	1/2 - 1 Mile North
61	USGS40001048282	1/2 - 1 Mile ENE
M62	USGS40001048165	1/2 - 1 Mile ESE
M63	USGS40001048166	1/2 - 1 Mile ESE
64	USGS40001048137	1/2 - 1 Mile SW
N65	USGS40001048126	1/2 - 1 Mile SSW
O66	USGS40001048210	1/2 - 1 Mile West
O67	USGS40001048209	1/2 - 1 Mile West
P68	USGS40001048342	1/2 - 1 Mile North
Q69	USGS40001048341	1/2 - 1 Mile North
R70	USGS40001048319	1/2 - 1 Mile NE
N71	USGS40001048116	1/2 - 1 Mile SSW
N72	USGS40001048117	1/2 - 1 Mile SSW
S73	USGS40001048224	1/2 - 1 Mile West
S74	USGS40001048227	1/2 - 1 Mile West
S75	USGS40001048226	1/2 - 1 Mile West
S76	USGS40001048225	1/2 - 1 Mile West
R77	USGS40001048315	1/2 - 1 Mile NE
78	USGS40001048138	1/2 - 1 Mile SW
T79	USGS40001048281	1/2 - 1 Mile ENE
R80	USGS40001048318	1/2 - 1 Mile NE
R81	USGS40001048313	1/2 - 1 Mile NE
R82	USGS40001048314	1/2 - 1 Mile NE
U83	USGS40001048164	1/2 - 1 Mile ESE
84	USGS40001048352	1/2 - 1 Mile North
P85	USGS40001048353	1/2 - 1 Mile North
86	USGS40001048312	1/2 - 1 Mile NE
Q87	USGS40001048351	1/2 - 1 Mile North
T88	USGS40001048297	1/2 - 1 Mile ENE
89	USGS40001048271	1/2 - 1 Mile WNW
V90	USGS40001048108	1/2 - 1 Mile SSW
V91	USGS40001048109	1/2 - 1 Mile SSW
U92	USGS40001048158	1/2 - 1 Mile ESE
V93	USGS40001048104	1/2 - 1 Mile SSW
W94	USGS40001048168	1/2 - 1 Mile WSW
W95	USGS40001048162	1/2 - 1 Mile WSW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
X96	USGS40001048127	1/2 - 1 Mile SW
X97	USGS40001048128	1/2 - 1 Mile SW
V98	USGS40001048094	1/2 - 1 Mile SSW
V99	USGS40001048093	1/2 - 1 Mile SSW
V100	USGS40001048095	1/2 - 1 Mile SSW
V101	USGS40001048097	1/2 - 1 Mile SSW
V102	USGS40001048096	1/2 - 1 Mile SSW
V103	USGS40001048098	1/2 - 1 Mile SSW
104	USGS40001048361	1/2 - 1 Mile North
105	USGS40001048163	1/2 - 1 Mile ESE
X106	USGS40001048129	1/2 - 1 Mile SW
Y107	USGS40001048269	1/2 - 1 Mile ENE
Y108	USGS40001048278	1/2 - 1 Mile ENE
109	USGS40001048362	1/2 - 1 Mile NNW
Z110	USGS40001048144	1/2 - 1 Mile WSW
AA111	USGS40001048089	1/2 - 1 Mile SSW
AA112	USGS40001048090	1/2 - 1 Mile SSW
115	USGS40001048139	1/2 - 1 Mile WSW
116	USGS40001048180	1/2 - 1 Mile WSW
Z117	USGS40001048145	1/2 - 1 Mile WSW
Z118	USGS40001048146	1/2 - 1 Mile WSW
119	USGS40001048151	1/2 - 1 Mile ESE
120	USGS40001048300	1/2 - 1 Mile WNW
AB121	USGS40001048122	1/2 - 1 Mile SW
AB122	USGS40001048123	1/2 - 1 Mile SW
AC123	USGS40001048276	1/2 - 1 Mile ENE
AC124	USGS40001048268	1/2 - 1 Mile ENE
125	USGS40001048188	1/2 - 1 Mile East
126	USGS40001048154	1/2 - 1 Mile WSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

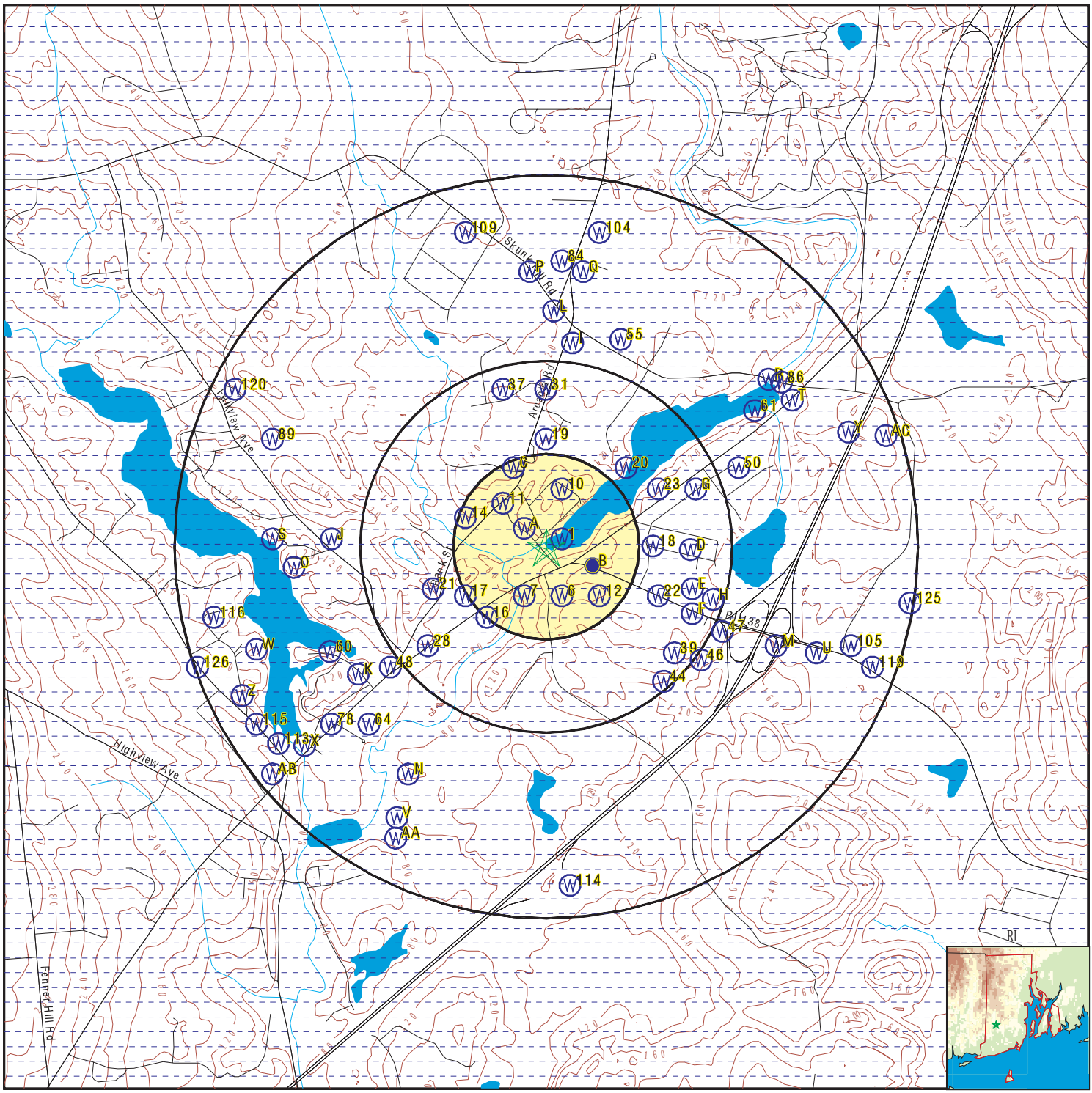
MAP ID	WELL ID	LOCATION FROM TP
B5	RI2980115	0 - 1/8 Mile ESE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
60	RI5000000000270	1/2 - 1 Mile WSW
113	RI5000000000272	1/2 - 1 Mile SW
114	RI5000000000274	1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 5380707.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
EPA Designated Sole Src. Aq.

N

SITE NAME:	Wyoming Upper Reservoir Dam	CLIENT:	Pare Corporation
ADDRESS:	Bridge St Wyoming RI 02898	CONTACT:	Nathan Meersman
		INQUIRY #:	5380707.2s
LAT/LONG:	41.515904 / 71.703378	DATE:	August 02, 2018 1:06 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
1 **ENE** **0 - 1/8 Mile** **Higher**	**FED USGS**	**USGS40001048219**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 196	Type:	Well
Description:	NOW USES DRIVEN WELL 25' DEEP WHICH SUPPLIES 2 PEO		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	16.7
Well Depth Units:	ft	Well Hole Depth:	16.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-21
Feet below surface:	13.9	Feet to sea level:	Not Reported
Note:	Not Reported		

A2 **WNW** **0 - 1/8 Mile** **Higher**	**FED USGS**	**USGS40001048220**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 199	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	13.7
Well Depth Units:	ft	Well Hole Depth:	13.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-21
Feet below surface:	11.61	Feet to sea level:	Not Reported
Note:	Not Reported		

A3 **NW** **0 - 1/8 Mile** **Higher**	**FED USGS**	**USGS40001048235**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 198	Type:	Well
Description:	EMERG. USE FOR 4 FAMILIES NOW USES DRIV. WELL IN B		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		

Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	23.7
Well Depth Units:	ft	Well Hole Depth:	23.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-21
Feet below surface:	21.99	Feet to sea level:	Not Reported
Note:	Not Reported		

B4
ESE
0 - 1/8 Mile
Higher

FED USGS **USGS40001048208**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 143	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	38
Well Depth Units:	ft	Well Hole Depth:	38
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-22
Feet below surface:	35	Feet to sea level:	Not Reported
Note:	Not Reported		

B5
ESE
0 - 1/8 Mile
Higher

FRDS PWS **RI2980115**

Epa region:	01	State:	RI
Pwsid:	RI2980115	Pwsname:	LITTLE KOUNTRY KITCHEN
Cityserved:	Not Reported	Stateserved:	RI
Zipserved:	Not Reported	Fipscounty:	44009
Status:	Closed	Retpopsrvd:	50
Pwssvcconn:	1	Psource longname:	Groundwater
Pwstype:	TNCWS	Owner:	Private
Contact:	LITTLE KOUNTRY KITCHEN	Contactorgname:	Not Reported
Contactphone:	401-789-5552	Contactaddress1:	418
Contactaddress2:	KINGSTOWN ROAD	Contactcity:	RICHMOND
Contactstate:	RI	Contactzip:	02892
Pwsactivitycode:	I		

Pwsid:	RI2980115	Facid:	1T
Facname:	DRILLED WELL # 1	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	particulate removal
Trtprocess:	filtration, cartridge	Factypecode:	TP

PWS ID:	RI2980115	PWS type:	System Owner/Responsible Party
PWS name:	PATTI READY	PWS address:	Not Reported
PWS city:	WEST KINGSTON	PWS state:	RI
PWS zip:	02892	PWS ID:	RI2980115
Activity status:	Active	Date system activated:	8604

Date system deactivated:	Not Reported	Retail population:	00000050
System name:	LITTLE KOUNTRY KITCHEN	System address:	Not Reported
System address:	418 KINGSTOWN ROAD	System city:	WEST KINGSTON
System state:	RI	System zip:	02892
County FIPS:	009	City served:	RICHMOND
Population served:	Under 101 Persons	Treatment:	Untreated
Latitude:	413055	Longitude:	0714206

6
SSE **FED USGS** **USGS40001048199**
1/8 - 1/4 Mile
Higher

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 131	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	195002
Well Depth:	67	Well Depth Units:	ft
Well Hole Depth:	67	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	25	Feet to sea level:	Not Reported
Note:	Not Reported		

7
SSW **FED USGS** **USGS40001048200**
1/8 - 1/4 Mile
Lower

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 130	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	195209	Well Depth:	13
Well Depth Units:	ft	Well Hole Depth:	13
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	8.5	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
B8 **ESE** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40001048207**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 133	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1948
Well Depth:	56	Well Depth Units:	ft
Well Hole Depth:	56	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	25.9	Feet to sea level:	Not Reported
Note:	Not Reported		

B9 **ESE** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40001048206**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 691	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	Not Reported
Well Depth:	29.8	Well Depth Units:	ft
Well Hole Depth:	29.8	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	46	Level reading date:	1985-10-13
Feet below surface:	26.96	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	1985-09-14	Feet below surface:	25.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-07-27	Feet below surface:	27.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-06-30	Feet below surface:	27.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-05-25	Feet below surface:	27.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-04-20	Feet below surface:	27.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-03-31	Feet below surface:	27.21

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-02-23	Feet below surface:	27.61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-01-27	Feet below surface:	27.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-12-26	Feet below surface:	27.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-11-28	Feet below surface:	27.91
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-31	Feet below surface:	28.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-09-26	Feet below surface:	28.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-08-29	Feet below surface:	27.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-08-01	Feet below surface:	26.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-06-27	Feet below surface:	26.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-06-13	Feet below surface:	25.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-05-30	Feet below surface:	26.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-04-30	Feet below surface:	25.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-28	Feet below surface:	25.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-05	Feet below surface:	25.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-02-28	Feet below surface:	26.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-02-01	Feet below surface:	26.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-30	Feet below surface:	25.67
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-01	Feet below surface:	26.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-27	Feet below surface:	27.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-09-13	Feet below surface:	28.07
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1983-07-28	Feet below surface:	27.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-30	Feet below surface:	26.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-03	Feet below surface:	25.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-28	Feet below surface:	23.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-11	Feet below surface:	25.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03-28	Feet below surface:	25.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03-14	Feet below surface:	25.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-28	Feet below surface:	26.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-14	Feet below surface:	26.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-01-31	Feet below surface:	26.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-01-13	Feet below surface:	27.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-30	Feet below surface:	27.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-16	Feet below surface:	27.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-01	Feet below surface:	27.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-11-15	Feet below surface:	27.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-11-02	Feet below surface:	28.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10-20	Feet below surface:	27.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-09-30	Feet below surface:	27.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-08-24	Feet below surface:	27.40
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
10 **NNE** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40001048252**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 197	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1935	Well Depth:	55
Well Depth Units:	ft	Well Hole Depth:	55
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-21
Feet below surface:	45	Feet to sea level:	Not Reported
Note:	Not Reported		

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11 **NW** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40001048242**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 420	Type:	Well
Description:	TOPOGRAPHY IS HUMMOCKY	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Till	Aquifer Type:	Unconfined single aquifer
Construction Date:	19670720	Well Depth:	76
Well Depth Units:	ft	Well Hole Depth:	81
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1967-07-20
Feet below surface:	1.06	Feet to sea level:	Not Reported
Note:	Not Reported		

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12 **SE** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40001048198**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 132	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	29.7

Well Depth Units:	ft	Well Hole Depth:	29.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	25.2	Feet to sea level:	Not Reported
Note:	Not Reported		

C13
NNW
1/8 - 1/4 Mile
Higher

FED USGS **USGS40001048259**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 122	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1945	Well Depth:	27
Well Depth Units:	ft	Well Hole Depth:	27
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1945
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

14
WNW
1/8 - 1/4 Mile
Higher

FED USGS **USGS40001048236**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 120	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	195012	Well Depth:	315
Well Depth Units:	ft	Well Hole Depth:	315
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-12
Feet below surface:	10	Feet to sea level:	Not Reported
Note:	Not Reported		

C15
NNW
1/8 - 1/4 Mile
Higher

FED USGS **USGS40001048260**

Organization ID:	USGS-MA
Organization Name:	USGS Massachusetts Water Science Center

Monitor Location:	RI-HOW 121	Type:	Well
Description:	HOXIE (DRILLER) SAYS WELL AT LEAST 40 FEET DEEP		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1935	Well Depth:	40
Well Depth Units:	ft	Well Hole Depth:	40
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	30	Feet to sea level:	Not Reported
Note:	Not Reported		

16
SW
1/8 - 1/4 Mile
Lower

FED USGS **USGS40001048179**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 195	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	14
Well Depth Units:	ft	Well Hole Depth:	14
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	11.39	Feet to sea level:	Not Reported
Note:	Not Reported		

17
WSW
1/4 - 1/2 Mile
Lower

FED USGS **USGS40001048201**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 211	Type:	Well
Description:	2 GPM @ 169’ 3 GPM @ 260’ 3.5 GPM @ 340		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	19401116	Well Depth:	53
Well Depth Units:	ft	Well Hole Depth:	340
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1940-11-16
Feet below surface:	12	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
18 **East** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048215**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 740	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19810206
Well Depth:	140	Well Depth Units:	ft
Well Hole Depth:	140	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1981-02-06
Feet below surface:	30	Feet to sea level:	Not Reported
Note:	Not Reported		

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19 **North** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048270**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 123	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1946	Well Depth:	35
Well Depth Units:	ft	Well Hole Depth:	35
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1946
Feet below surface:	30	Feet to sea level:	Not Reported
Note:	Not Reported		

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20 **NE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048258**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 484	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	1979
Well Depth:	400	Well Depth Units:	ft
Well Hole Depth:	400	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation		Database	EDR ID Number
21 **WSW** **1/4 - 1/2 Mile** **Higher**		**FED USGS**	**USGS40001048203**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 119	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	17.8
Well Depth Units:	ft	Well Hole Depth:	17.8
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	46	Level reading date:	1985-10-13
Feet below surface:	13.50	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	1985-09-15	Feet below surface:	12.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-07-27	Feet below surface:	15.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-06-30	Feet below surface:	14.61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-05-25	Feet below surface:	14.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-04-20	Feet below surface:	14.43
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-03-31	Feet below surface:	14.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-02-23	Feet below surface:	15.07
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-01-27	Feet below surface:	15.26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-12-26	Feet below surface:	14.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-11-28	Feet below surface:	15.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-31	Feet below surface:	15.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-09-26	Feet below surface:	14.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-08-29	Feet below surface:	13.25
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1984-08-01	Feet below surface:	11.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-06-27	Feet below surface:	9.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-06-13	Feet below surface:	9.01
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-04-30	Feet below surface:	9.57
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-28	Feet below surface:	9.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-05	Feet below surface:	10.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-02-28	Feet below surface:	10.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-02-01	Feet below surface:	11.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-30	Feet below surface:	10.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-01	Feet below surface:	11.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-27	Feet below surface:	16.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-09-13	Feet below surface:	14.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-07-28	Feet below surface:	12.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-30	Feet below surface:	10.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-03	Feet below surface:	9.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-28	Feet below surface:	6.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-11	Feet below surface:	8.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03-28	Feet below surface:	9.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03-14	Feet below surface:	10.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-28	Feet below surface:	11.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-14	Feet below surface:	12.68
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1983-01-31	Feet below surface:	13.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-01-13	Feet below surface:	14.17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-30	Feet below surface:	14.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-16	Feet below surface:	14.16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-01	Feet below surface:	14.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-11-15	Feet below surface:	14.44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-11-02	Feet below surface:	14.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10-20	Feet below surface:	14.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-09-30	Feet below surface:	13.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-09-17	Feet below surface:	13.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-08-24	Feet below surface:	12.85
Feet to sea level:	Not Reported	Note:	Not Reported

22
ESE **FED USGS** **USGS40001048197**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 134	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1948	Well Depth:	146
Well Depth Units:	ft	Well Hole Depth:	146
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-16
Feet below surface:	26.1	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
23 **ENE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048251**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 144	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1942	Well Depth:	35
Well Depth Units:	ft	Well Hole Depth:	35
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-22
Feet below surface:	30	Feet to sea level:	Not Reported
Note:	Not Reported		

D24 **East** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048218**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 739	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19810811
Well Depth:	200	Well Depth Units:	ft
Well Hole Depth:	200	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1981-08-11
Feet below surface:	33.29	Feet to sea level:	Not Reported
Note:	Not Reported		

E25 **East** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048205**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 752	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820623
Well Depth:	52.5	Well Depth Units:	ft
Well Hole Depth:	52.5	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation	Database	EDR ID Number
E26 **ESE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048196**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 743	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	Not Reported
Well Depth:	840	Well Depth Units:	ft
Well Hole Depth:	840	Well Hole Depth Units:	ft

D27 **East** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048212**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 741	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19810602
Well Depth:	755	Well Depth Units:	ft
Well Hole Depth:	755	Well Hole Depth Units:	ft

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28 **SW** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048167**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 48	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1937
Well Depth:	505	Well Depth Units:	ft
Well Hole Depth:	505	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1952-12-09
Feet below surface:	18	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
F29 **ESE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048178**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 136	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1950
Well Depth:	64	Well Depth Units:	ft
Well Hole Depth:	64	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1950
Feet below surface:	18	Feet to sea level:	Not Reported
Note:	Not Reported		

F30 **ESE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048187**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 746	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	19780801
Well Depth:	18	Well Depth Units:	ft
Well Hole Depth:	18	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1978-08-01
Feet below surface:	15.75	Feet to sea level:	Not Reported
Note:	Not Reported		

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31 **North** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40001048298**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 125	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	25.4
Well Depth Units:	ft	Well Hole Depth:	25.4

Well Hole Depth Units: ft

Ground water levels,Number of Measurements: 1 Level reading date: 1953-10-01
Feet below surface: 24.14 Feet to sea level: Not Reported
Note: Not Reported

F32
ESE **FED USGS** **USGS40001048172**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 742	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	1972
Well Depth:	300	Well Depth Units:	ft
Well Hole Depth:	300	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements: 1 Level reading date: 1981-07-24
Feet below surface: 16.47 Feet to sea level: Not Reported
Note: Not Reported

F33
ESE **FED USGS** **USGS40001048189**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 745	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19780801
Well Depth:	21.1	Well Depth Units:	ft
Well Hole Depth:	21.1	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements: 1 Level reading date: 1978-08-01
Feet below surface: 15.5 Feet to sea level: Not Reported
Note: Not Reported

G34
ENE **FED USGS** **USGS40001048249**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 85	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1933	Well Depth:	52
Well Depth Units:	ft	Well Hole Depth:	52
Well Hole Depth Units:	ft		

G35
ENE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048250**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 145	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1953	Well Depth:	48
Well Depth Units:	ft	Well Hole Depth:	48
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-22
Feet below surface:	35	Feet to sea level:	Not Reported
Note:	Not Reported		

E36
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048195**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 750	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820618
Well Depth:	37.5	Well Depth Units:	ft
Well Hole Depth:	37.5	Well Hole Depth Units:	ft

37
NNW
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048299**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 124	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		

Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	23.7
Well Depth Units:	ft	Well Hole Depth:	23.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	21.23	Feet to sea level:	Not Reported
Note:	Not Reported		

F38
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048177**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 135	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1949
Well Depth:	80	Well Depth Units:	ft
Well Hole Depth:	80	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1949
Feet below surface:	25	Feet to sea level:	Not Reported
Note:	Not Reported		

39
SE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048161**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 748	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820614
Well Depth:	21.5	Well Depth Units:	ft
Well Hole Depth:	21.5	Well Hole Depth Units:	ft

F40
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048186**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 749	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported

Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820616
Well Depth:	37	Well Depth Units:	ft
Well Hole Depth:	37	Well Hole Depth Units:	ft

H41
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048194**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 754	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820629
Well Depth:	32	Well Depth Units:	ft
Well Hole Depth:	32	Well Hole Depth Units:	ft

H42
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048193**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 751	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820621
Well Depth:	26	Well Depth Units:	ft
Well Hole Depth:	26	Well Hole Depth Units:	ft

H43
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048185**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 744	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19710714
Well Depth:	600	Well Depth Units:	ft
Well Hole Depth:	600	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1971-07-14
Feet below surface:	100	Feet to sea level:	Not Reported

Note: Not Reported

44
SE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048148**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 485	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	198805
Well Depth:	60	Well Depth Units:	ft
Well Hole Depth:	60	Well Hole Depth Units:	ft

H45
ESE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40001048192**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 753	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820625
Well Depth:	40.25	Well Depth Units:	ft
Well Hole Depth:	40.25	Well Hole Depth Units:	ft

46
SE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048159**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 755	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820701
Well Depth:	24.5	Well Depth Units:	ft
Well Hole Depth:	24.5	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation	Database	EDR ID Number
47 **ESE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048170**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 747	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Bedrock
Aquifer Type:	Unconfined single aquifer	Construction Date:	19820611
Well Depth:	44.25	Well Depth Units:	ft
Well Hole Depth:	44.25	Well Hole Depth Units:	ft

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48 **SW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048152**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 164	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	14.8
Well Depth Units:	ft	Well Hole Depth:	14.8
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	9.3	Feet to sea level:	Not Reported
Note:	Not Reported		

I49 **North** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048327**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 478	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	19880707
Well Depth:	80	Well Depth Units:	ft
Well Hole Depth:	80	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1988-07-07

Feet below surface:	15	Feet to sea level:	Not Reported
Note:	Not Reported		

50
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048257**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 146	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1942	Well Depth:	40
Well Depth Units:	ft	Well Hole Depth:	40
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-22
Feet below surface:	35	Feet to sea level:	Not Reported
Note:	Not Reported		

I51
North
1/2 - 1 Mile
Higher

FED USGS **USGS40001048329**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 126	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	22.2
Well Depth Units:	ft	Well Hole Depth:	22.2
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	20.66	Feet to sea level:	Not Reported
Note:	Not Reported		

J52
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048223**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 116	Type:	Well
Description:	CHEM ANAL. D.O.H. 01/13/54 LAB 166115		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		

Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	195210	Well Depth:	27
Well Depth Units:	ft	Well Hole Depth:	27
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-05
Feet below surface:	23	Feet to sea level:	Not Reported
Note:	Not Reported		

J53
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048222**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 115	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	195011
Well Depth:	320	Well Depth Units:	ft
Well Hole Depth:	320	Well Hole Depth Units:	ft

J54
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048221**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 114	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	195011	Well Depth:	24
Well Depth Units:	ft	Well Hole Depth:	24
Well Hole Depth Units:	ft		

55
NNE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048328**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 129	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer

Construction Date:	1947	Well Depth:	44.3
Well Depth Units:	ft	Well Hole Depth:	44.3
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	30.43	Feet to sea level:	Not Reported
Note:	Not Reported		

K56
SW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048149**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 241	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	195408
Well Depth:	100	Well Depth Units:	ft
Well Hole Depth:	100	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1955-01-18
Feet below surface:	32	Feet to sea level:	Not Reported
Note:	Not Reported		

K57
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048153**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 163	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	95
Well Depth Units:	ft	Well Hole Depth:	95
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
L58 **North** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048334**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 130	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1950	Well Depth:	55
Well Depth Units:	ft	Well Hole Depth:	55
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1950
Feet below surface:	25	Feet to sea level:	Not Reported
Note:	Not Reported		

L59 **North** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048333**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 128	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	17.4
Well Depth Units:	ft	Well Hole Depth:	17.4
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	14.06	Feet to sea level:	Not Reported
Note:	Not Reported		

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60 **WSW** **1/2 - 1 Mile** **Higher**	**RI WELLS**	**RI5000000000270**

Fid:	240	Town name:	HOPKINTON
Type:	T	Name:	American Legion Post #27
Wellname:	Driven Well #1	Source id:	2788020-01
Popserved:	100	Pumpvalue:	10
Material:	B	Whpa dia:	1750
Delin meth:	Calculated Fixed Radius	Pwsid:	2788020
Pumprate:	10	Edit date:	20030101
Quad:	Hope Valley	Well depth:	N/A
Point x:	-71.71459	Point y:	41.511818

Status:	A	Wsfid:	WL001
Ipr:	200	Site id:	RI5000000000270

61
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048282**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 74	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Till	Aquifer Type:	Unconfined single aquifer
Construction Date:	1932	Well Depth:	18
Well Depth Units:	ft	Well Hole Depth:	18
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1952-12-03
Feet below surface:	10	Feet to sea level:	Not Reported
Note:	Not Reported		

M62
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048165**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 212		
Type:	Well: Test hole not completed as a well		
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	19520327	Well Depth:	9.95
Well Depth Units:	ft	Well Hole Depth:	9.95
Well Hole Depth Units:	ft		

M63
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048166**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 217		
Type:	Well: Test hole not completed as a well		
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	19520327	Well Depth:	15.3

Well Depth Units:	ft	Well Hole Depth:	15.3
Well Hole Depth Units:	ft		

64
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048137**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 162	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	45
Well Depth Units:	ft	Well Hole Depth:	45
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	9	Feet to sea level:	Not Reported
Note:	Not Reported		

N65
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048126**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 711	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801022	Well Depth:	58.6
Well Depth Units:	ft	Well Hole Depth:	58.6
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-10-22
Feet below surface:	3.92	Feet to sea level:	Not Reported
Note:	Not Reported		

O66
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048210**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 118	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported

Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	50
Well Depth Units:	ft	Well Hole Depth:	50
Well Hole Depth Units:	ft		

O67
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048209**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 117	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1950	Well Depth:	18
Well Depth Units:	ft	Well Hole Depth:	18
Well Hole Depth Units:	ft		

P68
North
1/2 - 1 Mile
Higher

FED USGS **USGS40001048342**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 422	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Not Reported	Construction Date:	19740710
Well Depth:	40	Well Depth Units:	ft
Well Hole Depth:	40	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1974-07-10
Feet below surface:	15.42	Feet to sea level:	Not Reported
Note:	Not Reported		

Q69
North
1/2 - 1 Mile
Higher

FED USGS **USGS40001048341**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 127	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		

Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	1948
Well Depth:	17.1	Well Depth Units:	ft
Well Hole Depth:	17.1	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-01
Feet below surface:	15.95	Feet to sea level:	Not Reported
Note:	Not Reported		

R70
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048319**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOB 460	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19820118	Well Depth:	16.5
Well Depth Units:	ft	Well Hole Depth:	16.5
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-18
Feet below surface:	2.50	Feet to sea level:	Not Reported
Note:	Not Reported		

N71
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048116**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 709	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801105	Well Depth:	67.7
Well Depth Units:	ft	Well Hole Depth:	72
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-11-05
Feet below surface:	5.80	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
N72 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048117**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 710	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801105	Well Depth:	15
Well Depth Units:	ft	Well Hole Depth:	15
Well Hole Depth Units:	ft		

S73 **West** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048224**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 144	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1951	Well Depth:	18
Well Depth Units:	ft	Well Hole Depth:	18
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-06
Feet below surface:	15	Feet to sea level:	Not Reported
Note:	Not Reported		

S74 **West** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048227**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 147	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1951	Well Depth:	42
Well Depth Units:	ft	Well Hole Depth:	42
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-06
Feet below surface:	15	Feet to sea level:	Not Reported
Note:	Not Reported		

S75
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048226**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 146	Type:	Well
Description:	NEXT TO BROWNING 27' TO ROCK		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1951	Well Depth:	14
Well Depth Units:	ft	Well Hole Depth:	14
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-06
Feet below surface:	10	Feet to sea level:	Not Reported
Note:	Not Reported		

S76
West
1/2 - 1 Mile
Higher

FED USGS **USGS40001048225**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 145	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1951	Well Depth:	28
Well Depth Units:	ft	Well Hole Depth:	28
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-06
Feet below surface:	15	Feet to sea level:	Not Reported
Note:	Not Reported		

R77
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048315**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOB 459	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19820119	Well Depth:	44.5
Well Depth Units:	ft	Well Hole Depth:	44.5
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-19
Feet below surface:	5.00	Feet to sea level:	Not Reported
Note:	Not Reported		

78
SW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048138**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 161	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	13
Well Depth Units:	ft	Well Hole Depth:	13
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	8.09	Feet to sea level:	Not Reported
Note:	Not Reported		

T79
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048281**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 147	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	195310
Well Depth:	13	Well Depth Units:	ft
Well Hole Depth:	13	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-22
Feet below surface:	7.84	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
R80 **NE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048318**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOB 458	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19820113	Well Depth:	52
Well Depth Units:	ft	Well Hole Depth:	52
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-13
Feet below surface:	-4.50	Feet to sea level:	Not Reported
Note:	Not Reported		

R81 **NE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048313**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIB 692	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Not Reported	Construction Date:	19820111
Well Depth:	27	Well Depth Units:	ft
Well Hole Depth:	27	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-11
Feet below surface:	-5.50	Feet to sea level:	Not Reported
Note:	Not Reported		

R82 **NE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048314**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIB 693	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Not Reported	Construction Date:	19820108

Well Depth:	35	Well Depth Units:	ft
Well Hole Depth:	35	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-08
Feet below surface:	-3.50	Feet to sea level:	Not Reported
Note:	Not Reported		

U83
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048164**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 137	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1925	Well Depth:	16.2
Well Depth Units:	ft	Well Hole Depth:	16.2
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-20
Feet below surface:	13.5	Feet to sea level:	Not Reported
Note:	Not Reported		

84
North
1/2 - 1 Mile
Higher

FED USGS **USGS40001048352**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 418	Type:	Well
Description:	PH > 6.0 < 6.5 FE TOTAL < 0.05		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	196609
Well Depth:	40	Well Depth Units:	ft
Well Hole Depth:	40	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1966-09
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
P85 **North** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048353**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 131	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	30
Well Depth Units:	ft	Well Hole Depth:	30
Well Hole Depth Units:	ft		

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86 **NE** **1/2 - 1 Mile** **Higher**		**FED USGS**	**USGS40001048312**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIB 694	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Not Reported	Construction Date:	19820115
Well Depth:	16.5	Well Depth Units:	ft
Well Hole Depth:	16.5	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1982-01-15
Feet below surface:	4.00	Feet to sea level:	Not Reported
Note:	Not Reported		

Q87 **North** **1/2 - 1 Mile** **Higher**		**FED USGS**	**USGS40001048351**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 200	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1940	Well Depth:	30
Well Depth Units:	ft	Well Hole Depth:	30
Well Hole Depth Units:	ft		

Map ID Direction Distance Elevation	Database	EDR ID Number
T88 **ENE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048297**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIB 695	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Not Reported	Construction Date:	19820115
Well Depth:	16.5	Well Depth Units:	ft
Well Hole Depth:	16.5	Well Hole Depth Units:	ft

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89 **WNW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048271**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 113	Type:	Well
Description:	WELL IS ABOUT 140 FEET IN BACK OF BARN		
HUC:	01090005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	12.1
Well Depth Units:	ft	Well Hole Depth:	12.1
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-09-30
Feet below surface:	10.3	Feet to sea level:	Not Reported
Note:	Not Reported		

V90 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048108**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 707	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801204	Well Depth:	22
Well Depth Units:	ft	Well Hole Depth:	22
Well Hole Depth Units:	ft		

Map ID Direction Distance Elevation	Database	EDR ID Number
V91 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048109**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 708	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801204	Well Depth:	21
Well Depth Units:	ft	Well Hole Depth:	22
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-04
Feet below surface:	4.20	Feet to sea level:	Not Reported
Note:	Not Reported		

U92 **ESE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048158**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 138	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	10.9
Well Depth Units:	ft	Well Hole Depth:	10.9
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-20
Feet below surface:	9.7	Feet to sea level:	Not Reported
Note:	Not Reported		

V93 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048104**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 706	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801205	Well Depth:	56

Well Depth Units:	ft	Well Hole Depth:	56
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-05
Feet below surface:	1.60	Feet to sea level:	Not Reported
Note:	Not Reported		

W94
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048168**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 154	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1940	Well Depth:	28
Well Depth Units:	ft	Well Hole Depth:	28
Well Hole Depth Units:	ft		

W95
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048162**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 483	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	1980
Well Depth:	34	Well Depth Units:	ft
Well Hole Depth:	34	Well Hole Depth Units:	ft

X96
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048127**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 46	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1926
Well Depth:	125	Well Depth Units:	ft
Well Hole Depth:	125	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1952-12-09
Feet below surface:	30	Feet to sea level:	Not Reported
Note:	Not Reported		

X97
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048128**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 160	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	195202
Well Depth:	185	Well Depth Units:	ft
Well Hole Depth:	185	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1952-12-08
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

V98
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048094**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 697	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801023	Well Depth:	87
Well Depth Units:	ft	Well Hole Depth:	87
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-10-24
Feet below surface:	8.50	Feet to sea level:	Not Reported
Note:	Not Reported		

V99
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048093**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 696	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		

Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801223	Well Depth:	58
Well Depth Units:	ft	Well Hole Depth:	87
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1981-01-12
Feet below surface:	7.65	Feet to sea level:	Not Reported
Note:	Not Reported		

V100
SSW **FED USGS** **USGS40001048095**
1/2 - 1 Mile
Lower

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 698	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801201	Well Depth:	55
Well Depth Units:	ft	Well Hole Depth:	87
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-01
Feet below surface:	6.90	Feet to sea level:	Not Reported
Note:	Not Reported		

V101
SSW **FED USGS** **USGS40001048097**
1/2 - 1 Mile
Lower

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 702	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801202	Well Depth:	55
Well Depth Units:	ft	Well Hole Depth:	55
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-02
Feet below surface:	6.90	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
V102 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048096**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 699	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801106	Well Depth:	88.5
Well Depth Units:	ft	Well Hole Depth:	89
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-11-06
Feet below surface:	7.50	Feet to sea level:	Not Reported
Note:	Not Reported		

V103 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048098**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 703	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801202	Well Depth:	97
Well Depth Units:	ft	Well Hole Depth:	97
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-02
Feet below surface:	15.20	Feet to sea level:	Not Reported
Note:	Not Reported		

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104 **North** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048361**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 201	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	28

Well Depth Units:	ft	Well Hole Depth:	28
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-21
Feet below surface:	24.0	Feet to sea level:	Not Reported
Note:	Not Reported		

105
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048163**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 139	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1938	Well Depth:	17.5
Well Depth Units:	ft	Well Hole Depth:	17.5
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-20
Feet below surface:	15.0	Feet to sea level:	Not Reported
Note:	Not Reported		

X106
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40001048129**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 159	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1949
Well Depth:	106	Well Depth Units:	ft
Well Hole Depth:	106	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	1	Feet to sea level:	Not Reported
Note:	Not Reported		

Y107
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048269**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 96	Type:	Well

Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	9.8
Well Depth Units:	ft	Well Hole Depth:	9.8
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-08-21
Feet below surface:	4.86	Feet to sea level:	Not Reported
Note:	Not Reported		

Y108
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048278**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 096	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	9.8	Well Depth Units:	ft
Well Hole Depth:	9.8	Well Hole Depth Units:	ft

109
NNW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048362**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 132	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1951	Well Depth:	18
Well Depth Units:	ft	Well Hole Depth:	18
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1951
Feet below surface:	12	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
Z110 **WSW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048144**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 157	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1920
Well Depth:	104	Well Depth Units:	ft
Well Hole Depth:	104	Well Hole Depth Units:	ft

AA111 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048089**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 704	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801204	Well Depth:	80
Well Depth Units:	ft	Well Hole Depth:	80
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-04
Feet below surface:	4.20	Feet to sea level:	Not Reported
Note:	Not Reported		

AA112 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40001048090**	

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 705	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19801204	Well Depth:	20
Well Depth Units:	ft	Well Hole Depth:	20
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1980-12-04

Feet below surface:	4.60	Feet to sea level:	Not Reported
Note:	Not Reported		

113
SW
1/2 - 1 Mile
Higher

RI WELLS **RI5000000000272**

Fid:	233	Town name:	HOPKINTON
Type:	T	Name:	Legends Bar and Grill Inc.
Wellname:	Drilled Well	Source id:	2980090-01
Popserved:	100	Pumpvalue:	10
Material:	B	Whpa dia:	1750
Delin meth:	Calculated Fixed Radius	Pwsid:	2980090
Pumprate:	10	Edit date:	20030101
Quad:	Hope Valley	Well depth:	N/A
Point x:	-71.71726	Point y:	41.508231
Status:	A	Wsfid:	WL001
Ipr:	200	Site id:	RI5000000000272

114
South
1/2 - 1 Mile
Higher

RI WELLS **RI5000000000274**

Fid:	230	Town name:	RICHMOND
Type:	T	Name:	RI Welcome Center
Wellname:	Drilled Well	Source id:	2980178-01
Popserved:	2000	Pumpvalue:	13
Material:	B	Whpa dia:	1920
Delin meth:	Calculated Fixed Radius	Pwsid:	2980178
Pumprate:	13	Edit date:	20030101
Quad:	Hope Valley	Well depth:	N/A
Point x:	-71.702145	Point y:	41.502704
Status:	A	Wsfid:	WL001
Ipr:	200	Site id:	RI5000000000274

115
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048139**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 158	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	18.5
Well Depth Units:	ft	Well Hole Depth:	18.5
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	16.9	Feet to sea level:	Not Reported
Note:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
116 **WSW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048180**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 153	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	30.1
Well Depth Units:	ft	Well Hole Depth:	30.1
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	27.2	Feet to sea level:	Not Reported
Note:	Not Reported		

Z117 **WSW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048145**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 155	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	24
Well Depth Units:	ft	Well Hole Depth:	24
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

Z118 **WSW** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40001048146**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 156	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	23.8

Well Depth Units:	ft	Well Hole Depth:	23.8
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	22.4	Feet to sea level:	Not Reported
Note:	Not Reported		

119
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048151**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 140	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	195206	Well Depth:	21
Well Depth Units:	ft	Well Hole Depth:	21
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-20
Feet below surface:	18.4	Feet to sea level:	Not Reported
Note:	Not Reported		

120
WNW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048300**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 112	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	28
Well Depth Units:	ft	Well Hole Depth:	28
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-09-30
Feet below surface:	24.20	Feet to sea level:	Not Reported
Note:	Not Reported		

AB121
SW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048122**

Organization ID:	USGS-MA
Organization Name:	USGS Massachusetts Water Science Center

Monitor Location:	RI-HOW 47	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	1929
Well Depth:	120	Well Depth Units:	ft
Well Hole Depth:	120	Well Hole Depth Units:	ft

AB122
SW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048123**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 190	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	28
Well Depth Units:	ft	Well Hole Depth:	28
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-15
Feet below surface:	20	Feet to sea level:	Not Reported
Note:	Not Reported		

AC123
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048276**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 097	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	12.7	Well Depth Units:	ft
Well Hole Depth:	12.7	Well Hole Depth Units:	ft

AC124
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40001048268**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 97	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	Not Reported	Well Depth:	12.7
Well Depth Units:	ft	Well Hole Depth:	12.7
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-08-21
Feet below surface:	10.6	Feet to sea level:	Not Reported
Note:	Not Reported		

125
East
1/2 - 1 Mile
Higher

FED USGS **USGS40001048188**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-RIW 762		
Type:	Well: Test hole not completed as a well		
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Stratified Deposits, Undifferentiated		
Aquifer Type:	Unconfined single aquifer	Construction Date:	Not Reported
Well Depth:	30.5	Well Depth Units:	ft
Well Hole Depth:	30.5	Well Hole Depth Units:	ft

126
WSW
1/2 - 1 Mile
Higher

FED USGS **USGS40001048154**

Organization ID:	USGS-MA		
Organization Name:	USGS Massachusetts Water Science Center		
Monitor Location:	RI-HOW 152	Type:	Well
Description:	Not Reported	HUC:	01090005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Not Reported	Aquifer Type:	Unconfined single aquifer
Construction Date:	1940	Well Depth:	25
Well Depth Units:	ft	Well Hole Depth:	25
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1953-10-09
Feet below surface:	19	Feet to sea level:	Not Reported
Note:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: RI Radon

Radon Test Results

Zipcode	Num Tests	# < 4 pCi/L	4 to 20	# > 20 pCi/L	Maximum
02898	202	90	99	13	96.6

Federal EPA Radon Zone for WASHINGTON County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 02898

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	5.800 pCi/L	0%	100%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: US Fish & Wildlife Service
Telephone: 703-358-2171

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Community and Non-Community Wells
Source: Department of Environmental Management
Telephone: 401-277-2234
Includes Community, Non-Transient Non-Community and Transient Non-Community.

EPA-Approved Sole Source Aquifers in Rhode Island
Source: EPA
Sole source aquifers are defined as an aquifer designated as the sole or principal source of drinking water for a given aquifer service area; that is, an aquifer which is needed to supply 50% or more of the drinking water for the area and for which there are no reasonable alternative sources should the aquifer become contaminated.

OTHER STATE DATABASE INFORMATION

RADON

State Database: RI Radon
Source: Department of Health
Telephone: 401-222-2438
Radon Test Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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Wyoming Upper Reservoir Dam

Bridge St

Wyoming, RI 02898

Inquiry Number: 5380707.3

August 02, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

08/02/18

Site Name:	Client Name:
Wyoming Upper Reservoir Dan	Pare Corporation
Bridge St	8 Blackstone Valley Place
Wyoming, RI 02898	Lincoln, RI 02865
EDR Inquiry # 5380707.3	Contact: Nathan Meersman

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Certified Sanborn Results:

Certification # 7D52-4DCB-A10F

PO # 16226.00

Project Wyoming Upper Reservoir Dam

Maps Provided:

1945

1935

1924

Sanborn® Library search results

Certification #: 7D52-4DCB-A10F

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- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

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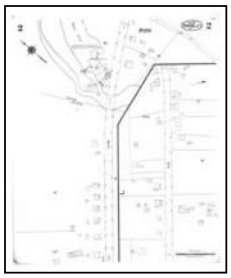
Sanborn Sheet Key

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1945 Source Sheets



Volume 1, Sheet 2
1945

Volume 1, Sheet Keymap/Sheet1
1945

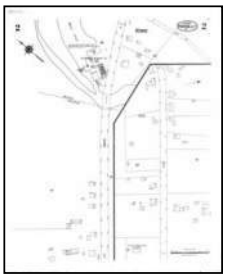
1935 Source Sheets

Volume 1, Sheet Keymap/Sheet1
1935

Volume 1, Sheet 2
1935

1924 Source Sheets

Volume 1, Sheet Keymap/Sheet1
1924



Volume 1, Sheet 2
1924

Certified Sanborn® Map

1945

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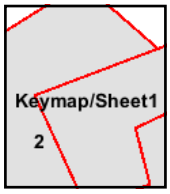
Certification # 7D52-4DCB-A10F

Site Name:	Wyoming Upper Reservoir Dam
Address:	Bridge St
City, ST, ZIP:	Wyoming, RI 02898
Client:	Pare Corporation
EDR Inquiry:	5380707.3
Order Date:	08/02/2018
Certification #	7D52-4DCB-A10F
Copyright	1945

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

0 Feet 150 300 600



Volume 1, Sheet Keymap/Sheet1
Volume 1, Sheet 2

N

Certified Sanborn® Map

1935

Site Name:	Wyoming Upper Reservoir Dam
Address:	Bridge St
City, ST, ZIP:	Wyoming, RI 02898
Client:	Pare Corporation
EDR Inquiry:	5380707.3
Order Date:	08/02/2018
Certification #	7D52-4DCB-A10F
Copyright	1935

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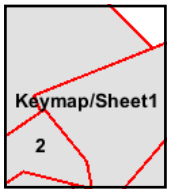
0 Feet 150 300 600

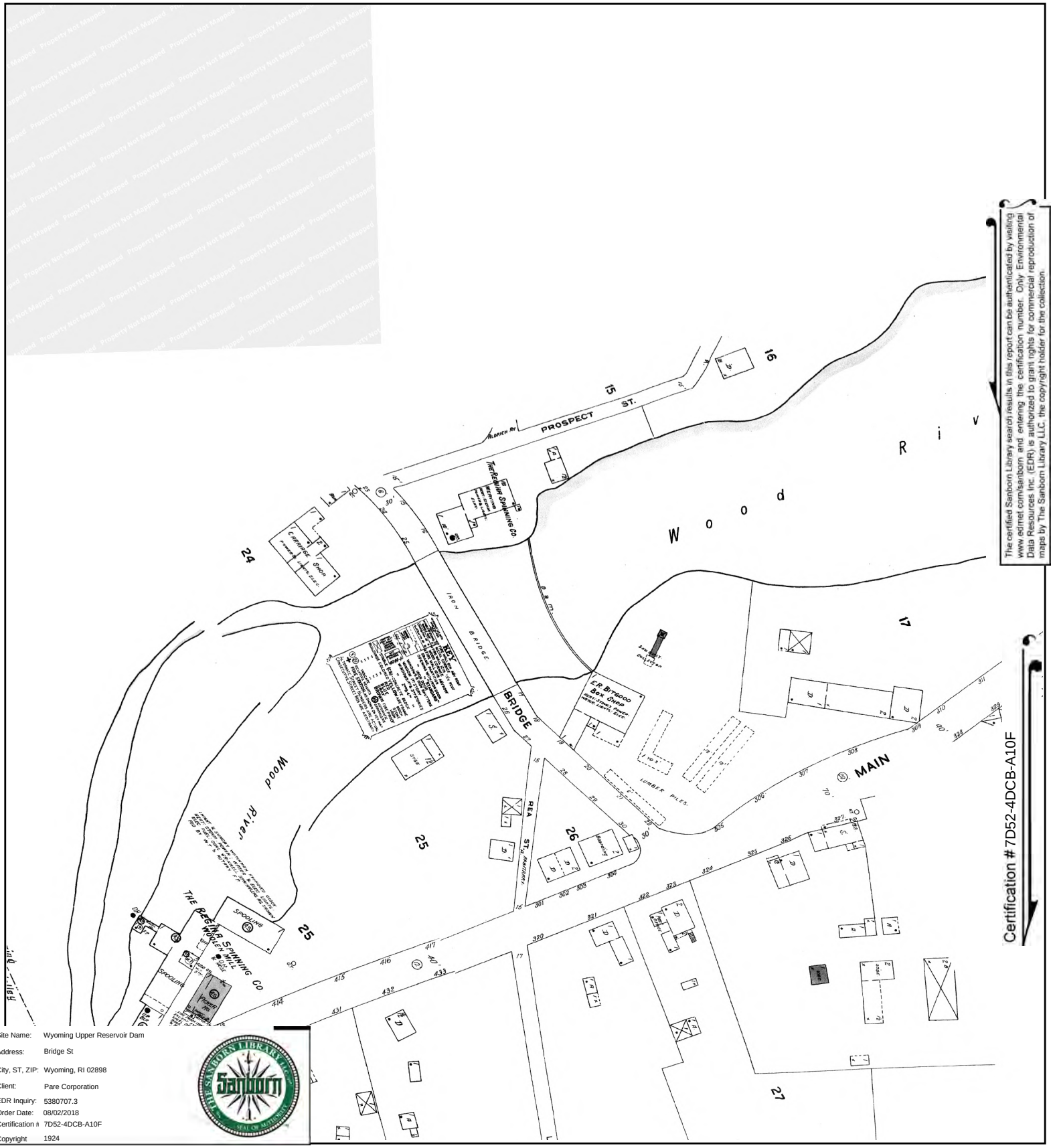


Volume 1, Sheet 2
Volume 1, Sheet Keymap/Sheet1

N

Certified Sanborn® Map

1924



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Site Name:	Wyoming Upper Reservoir Dam
Address:	Bridge St
City, ST, ZIP:	Wyoming, RI 02898
Client:	Pare Corporation
EDR Inquiry:	5380707.3
Order Date:	08/02/2018
Certification #	7D52-4DCB-A10F
Copyright	1924

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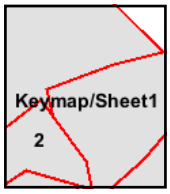
0 Feet 150 300 600



Volume 1, Sheet 2
Volume 1, Sheet Keymap/Sheet1

N

Wyoming Upper Reservoir Dam

Bridge St

Wyoming, RI 02898

Inquiry Number: 5380707.4

August 02, 2018

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

08/02/18

Site Name:	Client Name:
Wyoming Upper Reservoir Dan	Pare Corporation
Bridge St	8 Blackstone Valley Place
Wyoming, RI 02898	Lincoln, RI 02865
EDR Inquiry # 5380707.4	Contact: Nathan Meersman

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Pare Corporation were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	16226.00	**Latitude:**	41.515904 41° 30' 57" North
Project:	Wyoming Upper Reservoir Dan	**Longitude:**	-71.703378 -71° 42' 12" West
		UTM Zone:	Zone 19 North
		UTM X Meters:	274413.49
		UTM Y Meters:	4599558.78
		Elevation:	91.48' above sea level

Maps Provided:

2012
2001
1975
1970
1953
1943
1894
1889, 1890

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

Carolina
2012
7.5-minute, 24000

Hope Valley
2012
7.5-minute, 24000

2001 Source Sheets

Hope Valley
2001
7.5-minute, 24000
Aerial Photo Revised 2001

Carolina
2001
7.5-minute, 24000
Aerial Photo Revised 2001

1975 Source Sheets

Hope Valley
1975
7.5-minute, 24000
Aerial Photo Revised 1970

1970 Source Sheets

Hope Valley
1970
7.5-minute, 24000
Aerial Photo Revised 1970

Carolina
1970
7.5-minute, 24000
Aerial Photo Revised 1970

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1953 Source Sheets

Carolina
1953
7.5-minute, 24000

Hope Valley
1953
7.5-minute, 24000

1943 Source Sheets

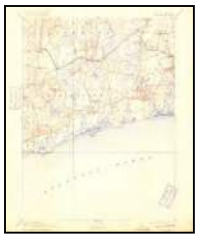
Carolina
1943
7.5-minute, 31680

Hope Valley
1943
7.5-minute, 31680

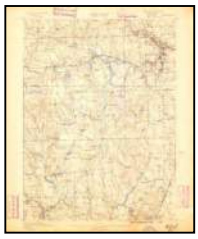
1894 Source Sheets

Kent
1894
15-minute, 62500

1889, 1890 Source Sheets



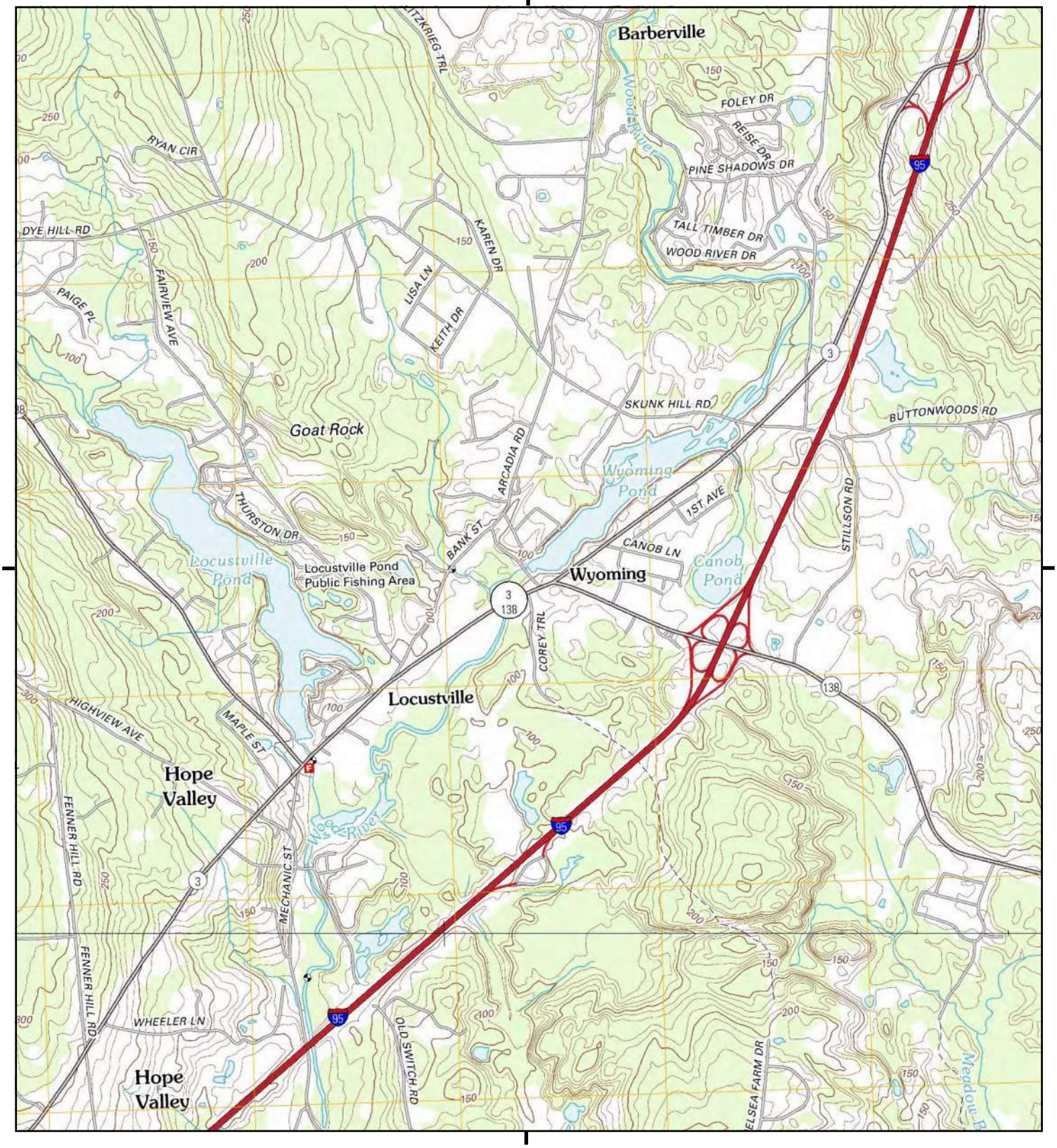
Charlestown
1889
15-minute, 62500



Kent
1890
15-minute, 62500

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

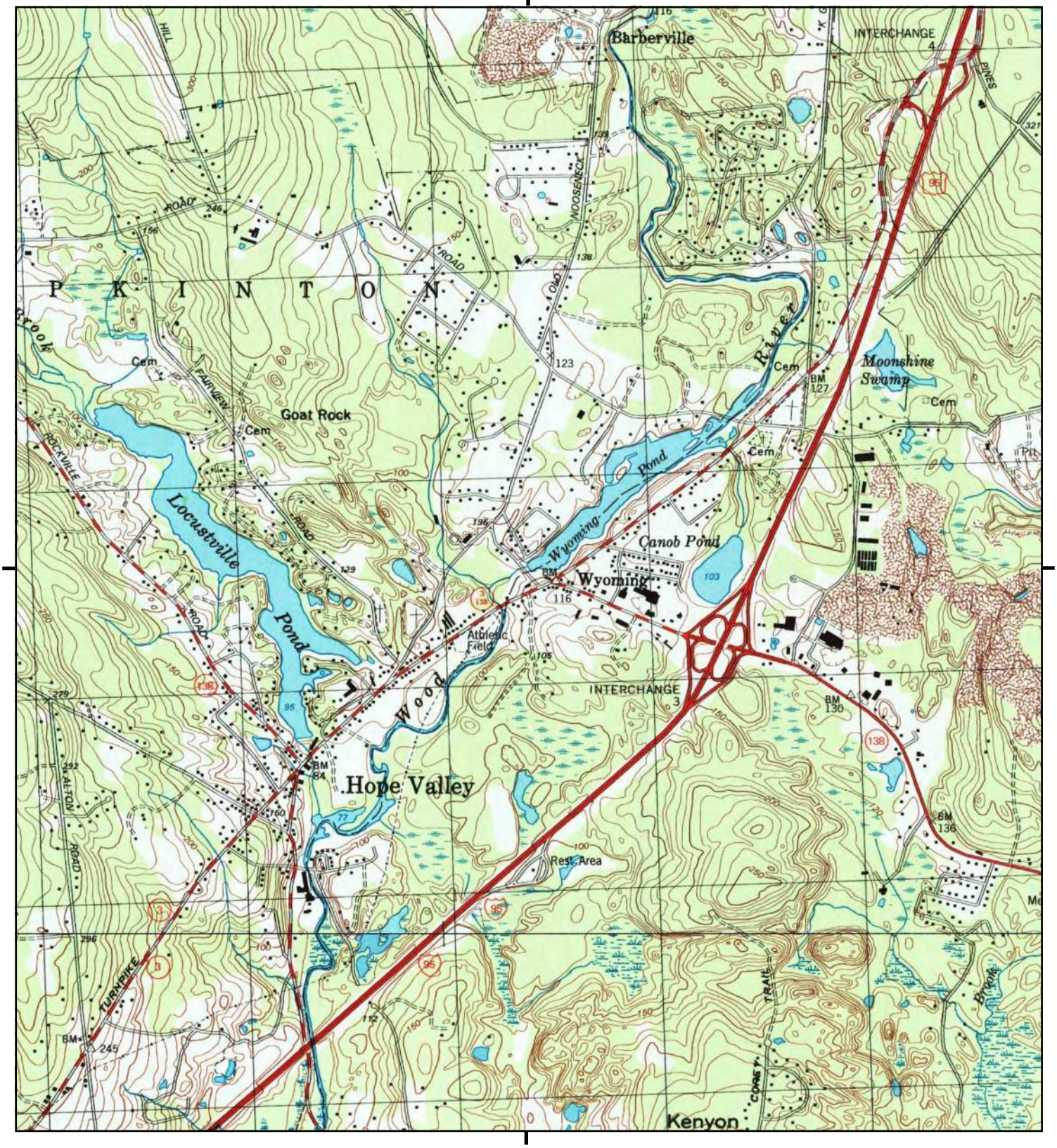
TP, Hope Valley, 2012, 7.5-minute
S, Carolina, 2012, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

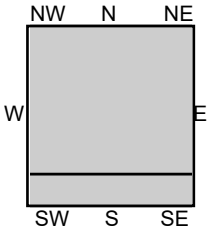
Historical Topo Map

2001



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



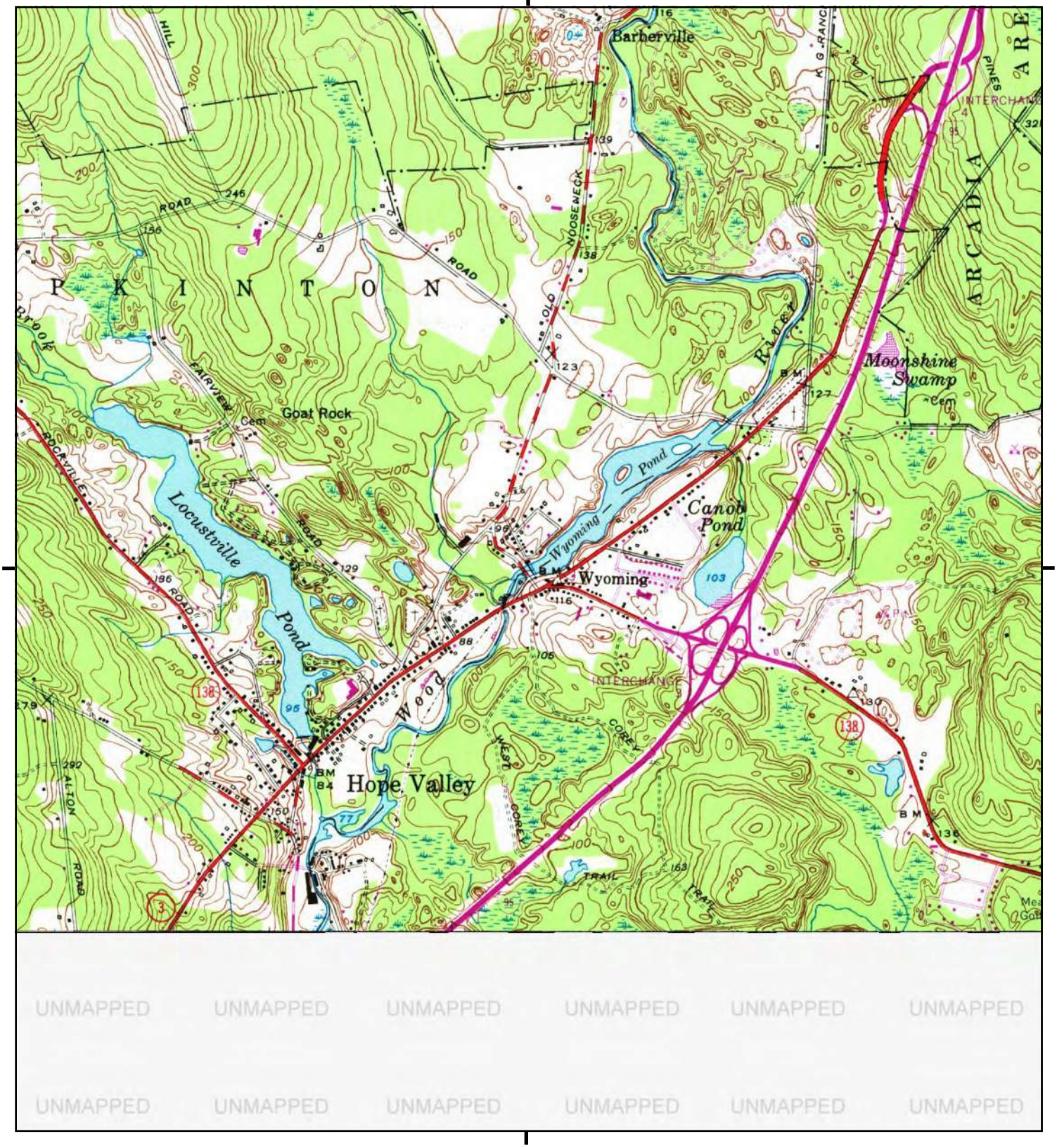
TP, Hope Valley, 2001, 7.5-minute
S, Carolina, 2001, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

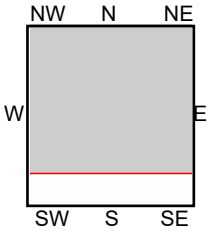
Historical Topo Map

1975



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



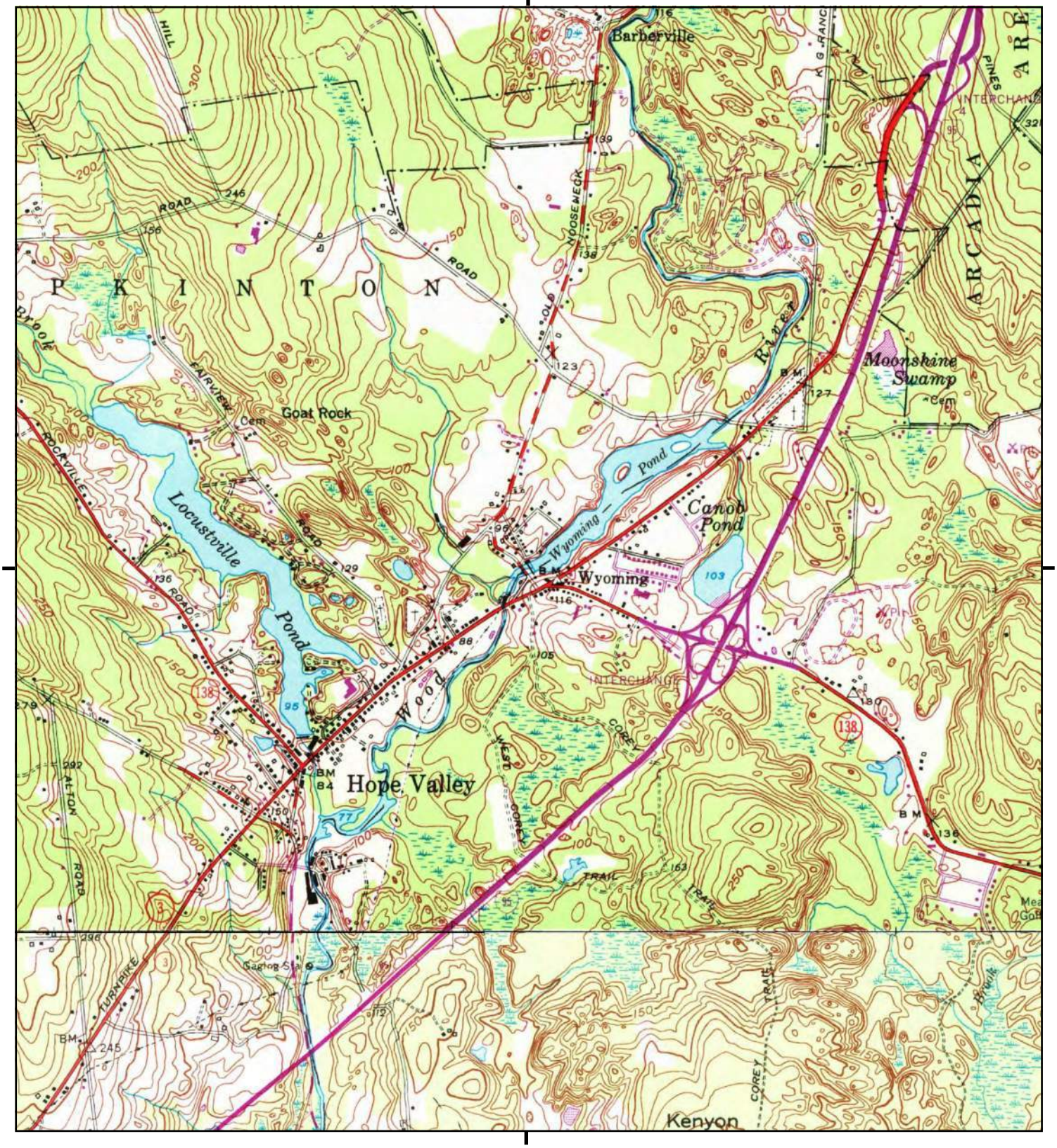
TP, Hope Valley, 1975, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

Historical Topo Map

1970



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

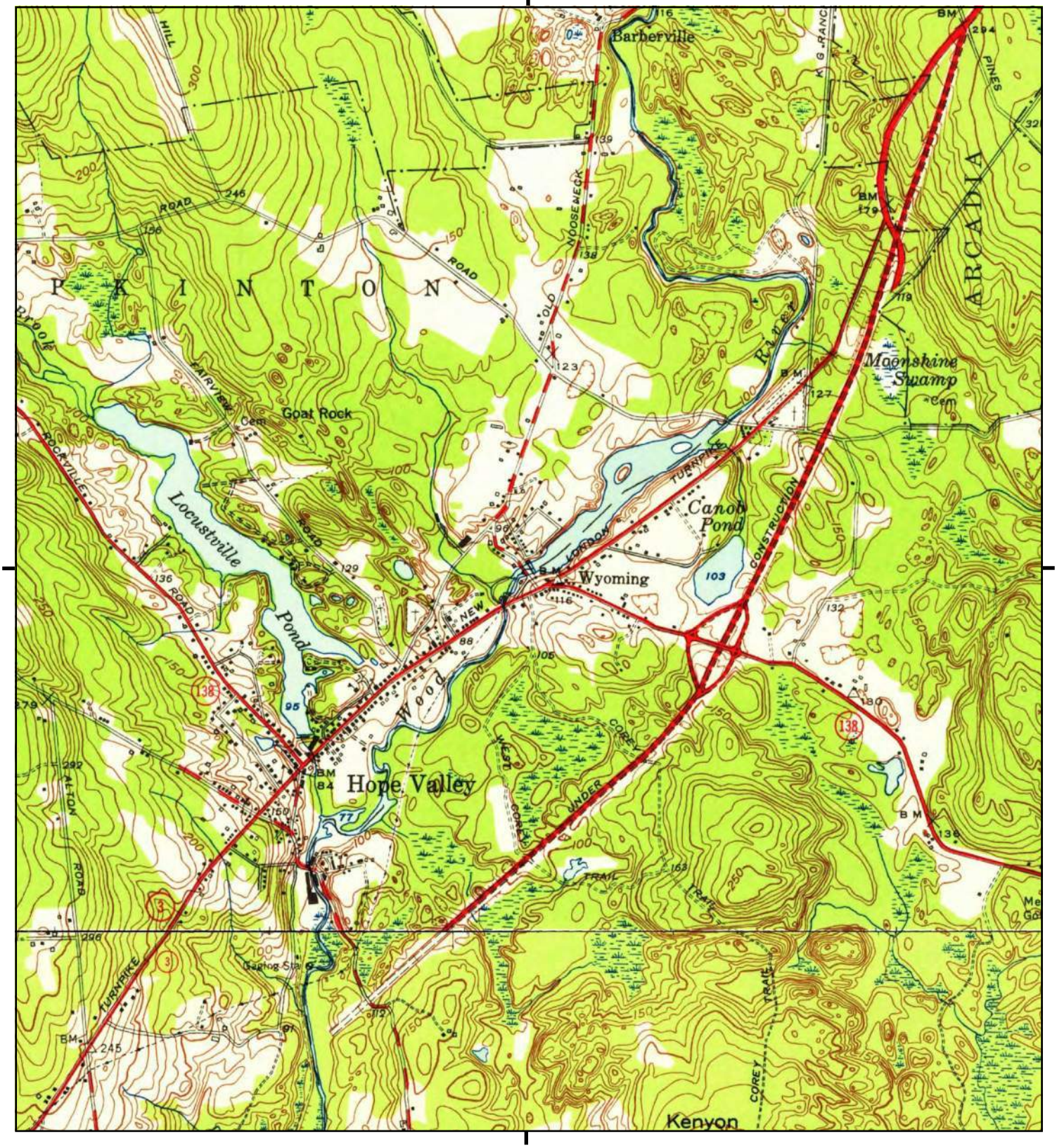
TP, Hope Valley, 1970, 7.5-minute
S, Carolina, 1970, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

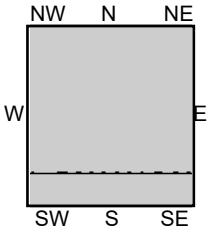
Historical Topo Map

1953



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



TP, Hope Valley, 1953, 7.5-minute
S, Carolina, 1953, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

Historical Topo Map

1943

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

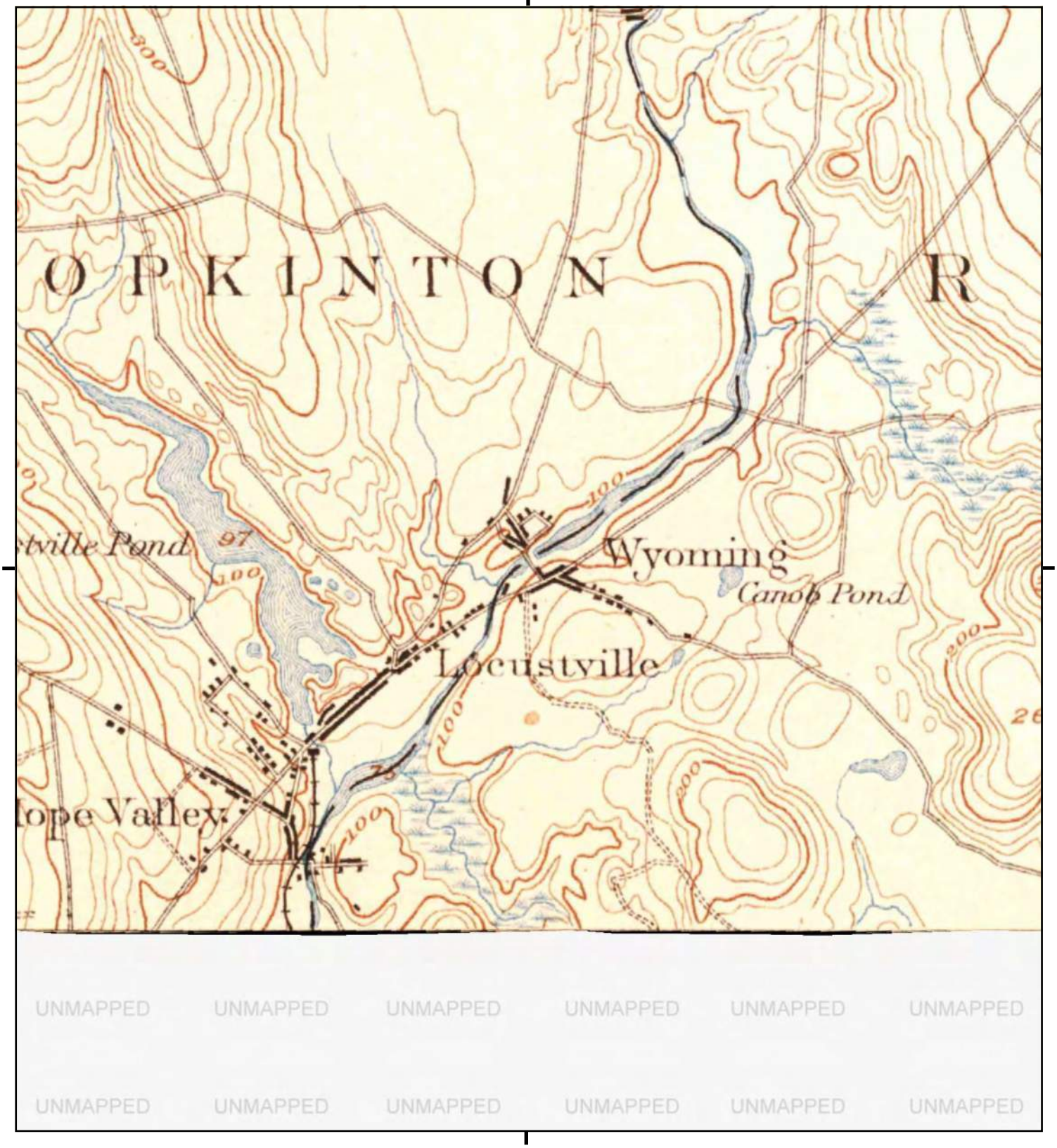
TP, Hope Valley, 1943, 7.5-minute
S, Carolina, 1943, 7.5-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

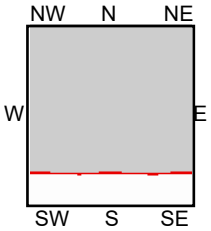
Historical Topo Map

1894



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



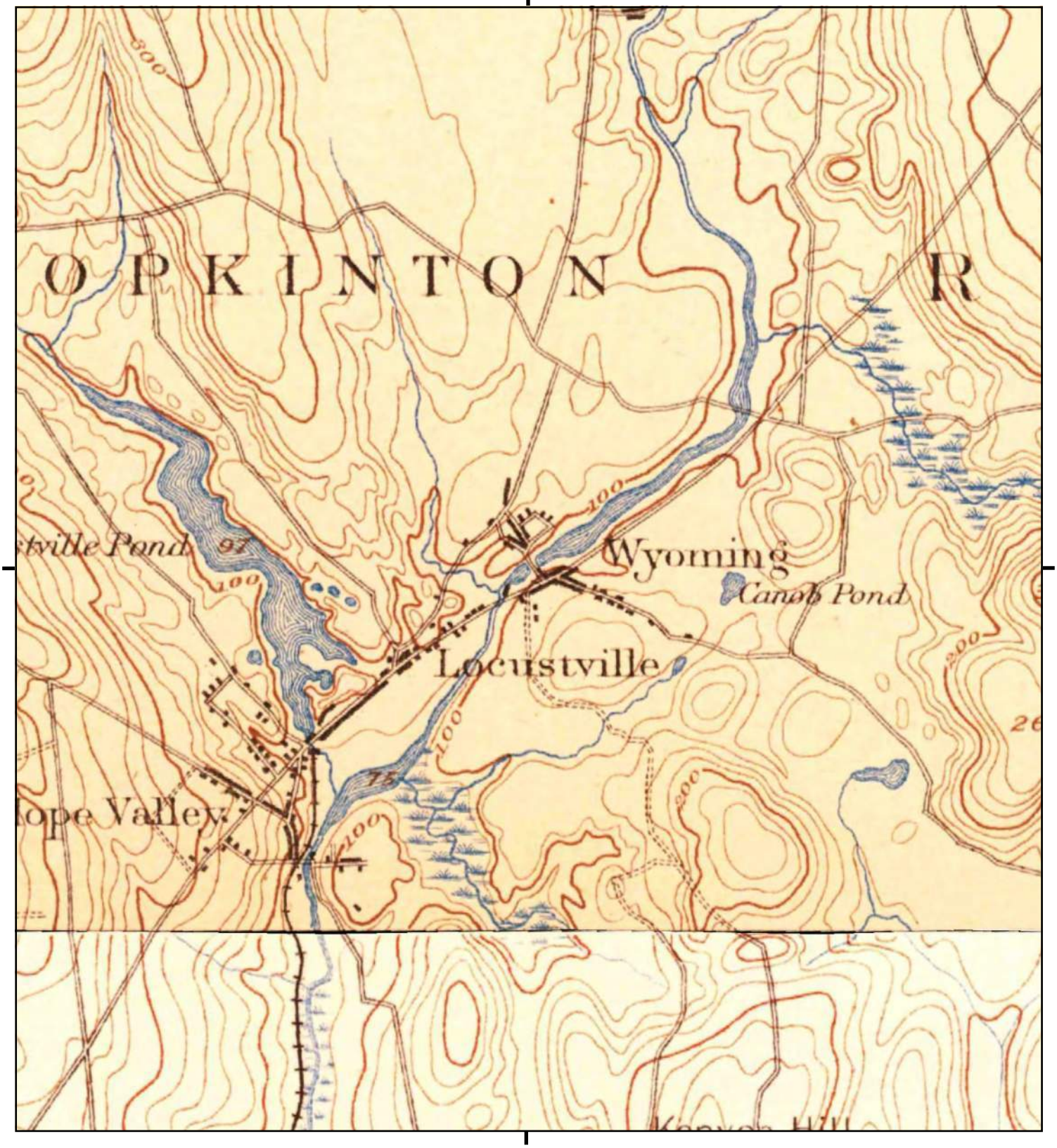
TP, Kent, 1894, 15-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

Historical Topo Map

1889, 1890



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Kent, 1890, 15-minute
SE, Charlestown, 1889, 15-minute

SITE NAME: Wyoming Upper Reservoir Dam
ADDRESS: Bridge St
Wyoming, RI 02898
CLIENT: Pare Corporation

N

Wyoming Upper Reservoir Dam

Bridge St

Wyoming, RI 02898

Inquiry Number: 5380707.8

August 02, 2018

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

08/02/18

Site Name:

Wyoming Upper Reservoir Dan
Bridge St
Wyoming, RI 02898
EDR Inquiry # 5380707.8

Client Name:

Pare Corporation
8 Blackstone Valley Place
Lincoln, RI 02865
Contact: Nathan Meersman

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	*Scale*	*Details*	*Source*
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2008	1"=500'	Flight Year: 2008	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
2001	1"=500'	Acquisition Date: April 05, 2001	USGS/DOQQ
1995	1"=500'	Flight Date: March 29, 1995	USGS
1990	1"=500'	Flight Date: April 13, 1990	USGS
1986	1"=500'	Flight Date: March 30, 1986	USGS
1981	1"=500'	Flight Date: April 13, 1981	RIGIS
1970	1"=500'	Flight Date: March 10, 1970	USGS
1962	1"=500'	Flight Date: April 27, 1962	RIGIS
1960	1"=500'	Flight Date: May 01, 1960	USGS
1951	1"=500'	Flight Date: October 20, 1951	RIGIS
1941	1"=500'	Flight Date: October 09, 1941	USGS
1939	1"=500'	Flight Date: May 10, 1939	RIGIS

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INQUIRY #: 5380707.8
YEAR: 2016
= 500'
N
EDR

INQUIRY #: 5380707.8

YEAR: 2012

= 500'

N

EDR

INQUIRY #: 5380707.8
YEAR: 2008
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 2005
= 500'
N
EDR

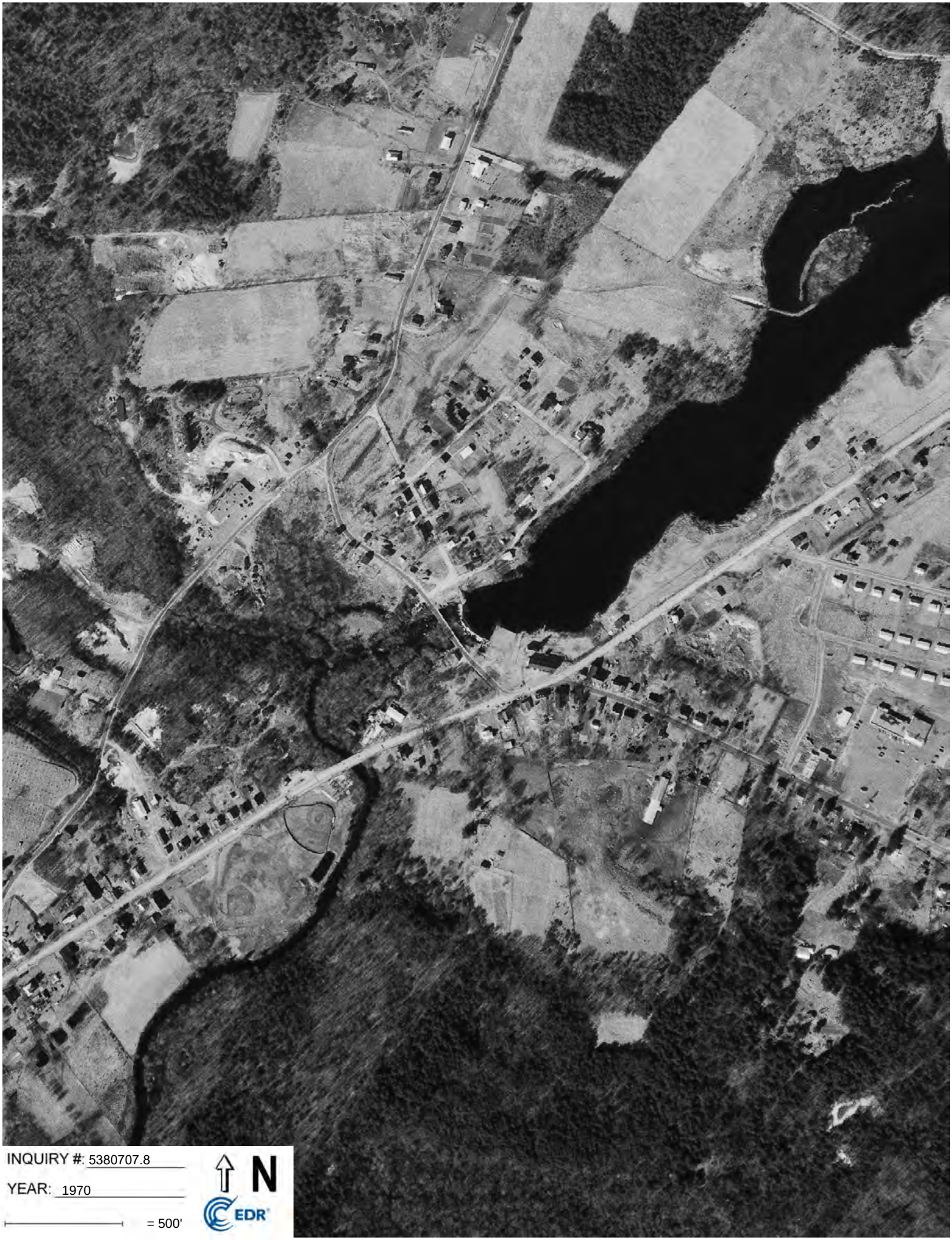
INQUIRY #: 5380707.8
YEAR: 2001
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1995
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1990
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1986
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1981
= 500'
N
EDR



INQUIRY #: 5380707.8

YEAR: 1970

= 500'

N

EDR

INQUIRY #: 5380707.8
YEAR: 1962
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1960
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1951
= 500'
N
EDR

INQUIRY #: 5380707.8
YEAR: 1941
= 500'
N
EDR

INQUIRY #: 5380707.8

YEAR: 1939

= 500'

N

EDR

Analytical Data Summary Table

Upper Wyoming Reservoir Dam

Wyoming, RI

Parameter	CAS No.	Method	Screening Benchmarks			Upstream Samples			Downstream Samples
(Important: Units listed by category below)			RIDEM R DEC Human Health	TEC Freshwater	PEC	US-1	US-2	US-3	DS-1
Metals [mg/kg]									
Arsenic	7440-38-2	6010C	7.0	9.79	33.0	ND	10.9	5.13	ND
Cadmium	7440-43-9	6010C	39.0	0.99	5.0	0.79	4.11	2.85	1.47
Chromium (TOTAL)	7440-47-3	6010C	390.0	43.40	111.0	0.44	15.0	11.5	0.79
Copper	7440-50-8	6010C	3,100.0	31.60	149.0	ND	12.6	6.77	ND
Lead	7439-92-1	6010C	150.0	35.80	128.0	4.54	104	69.9	37.0
Mercury	7439-97-6	7471B	23.0	0.18	1.1	ND	ND	ND	ND
Nickel	7440-02-0	6010C	1,000.0	22.70	48.6	0.48	9.31	5.68	1.32
Zinc	7440-66-6	6010C	6,000.0	121.00	459.0	20.9	148	87.9	32.1
SVOCs (PAHs) [µg/kg]									
2-Methylnaphthalene	91-57-6	8270/8100	123,000.0	NA	NA	ND	ND	ND	ND
Acenaphthylene	208-96-8	8270/8100	23,000.0	NA	NA	ND	ND	ND	ND
Anthracene	120-12-7	8270/8100	35,000.0	57.20	845.0	ND	ND	ND	ND
Benzo[a]anthracene	56-55-3	8270/8100	900.0	108.00	1,050.0	ND	ND	ND	426
Benzo[a]pyrene	50-32-8	8270/8100	400.0	150.00	1,450.0	ND	ND	ND	437
Benzo[b]fluoranthene	205-99-2	8270/8100	900.0	27.30	13,400.0	ND	ND	ND	581
Benzo[g,h,i]perylene	191-24-2	8270/8100	800.0	NA	NA	ND	ND	ND	217
Benzo[k]fluoranthene	207-08-9	8270/8100	900.0	NA	NA	ND	ND	ND	223
Chrysene	218-01-9	8270/8100	400.0	166.00	1,290.0	ND	ND	ND	471
Dibenzo[a,h]anthracene	53-70-3	8270/8100	400.0	33.00	260.0	ND	ND	ND	ND
Dibenzofuran	132-64-9	8270/8100	NA	NA	NA	ND	ND	ND	ND
Fluoranthene	206-44-0	8270/8100	20,000.0	423.00	2,230.0	ND	ND	ND	727
Fluorene	86-73-7	8270/8100	28,000.0	77.40	536.0	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene	193-39-5	8270/8100	900.0	NA	NA	ND	ND	ND	250
Naphthalene	91-20-3	8270/8100	54,000.0	176.00	561.0	ND	ND	ND	ND
Phenanthrene	85-01-8	8270/8100	40,000.0	204.00	1,170.0	ND	ND	ND	201
Pyrene	129-00-0	8270/8100	13,000.0	195.00	1,520.0	ND	ND	ND	643
Total PAHs			NA	1610.00	22,800.0	0	0	0	4,176
PCBs [µg/kg]									
Aroclor-1221		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1232		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1016/1242		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1248		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1254		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1260		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1262		8082A	NA	NA	NA	ND	ND	ND	ND
Aroclor-1268		8082A	NA	NA	NA	ND	ND	ND	ND
Total PCB's			10,000.0	59.80		0	0	0	0
EPH [mg/kg]									
C9-C18 Aliphatics		MADEP	NA	NA	NA	<16.8	<105	<61.2	<16.3
C19-C36 Aliphatics		MADEP	NA	NA	NA	<16.8	<105	<61.2	<16.3
C11-C22 Aromatics		MADEP	NA	NA	NA	<16.8	<105	<61.2	<16.3
Total Petroleum Hydrocarbons [mg/kg]		3550C	500.0			ND	833	142	61
Physical Characteristics									
Total Organic Carbon (%)						NT	NT	NT	NT
Percent Volatile Solids (%)						1.00	29.00	10.00	1.00
Percent Water (%)						22.50	87.70	79.00	22.90
Grain Size Distribution (%)		ASTM D422							
Sieve No. 4						65.2	100	100	39.4
Sieve No. 10						46.6	76.1	100	32.6
Sieve No. 20						27.6	64.3	60.6	12.3
Sieve No. 40						9.4	56.6	53.4	2.7
Sieve No. 60						2.1	49.7	47.3	1.3
Sieve No. 100						0.7	41.1	42.4	0.7
Sieve No. 200						0.4	33.7	36.4	0.3

Notes:

NT = Not Tested

ND = Not Detected

Prepared by:

Massachusetts Department of Fish and Game

Division of Ecological Restoration (DER)

Prepared by MassDER July 2009, Updated by PARE January 2015

This table is prepared and offered by MassDER for the benefit of all parties pursuing river restoration projects within Massachusetts.

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 8G31046
Client Project: 16226 - Wyoming Pond Dam

Report Date: 07-August-2018

Prepared for:

Pare Corp
Pare Corporation
8 Blackstone Valley Place
Lincoln, RI 02865

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 07/31/18. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 8G31046. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
8G31046-01	US-1	Soil	07/31/2018	07/31/2018
8G31046-02	US-2	Soil	07/31/2018	07/31/2018
8G31046-03	US-3	Soil	07/31/2018	07/31/2018
8G31046-04	DS-1	Soil	07/31/2018	07/31/2018

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

DS-1 (Lab Number: 8G31046-04)

Analysis	Method
Arsenic	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Copper	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
Polynuclear Aromatic Hydrocarbons	EPA 8270D
Sieve/particle size analysis	By Subcontract
Total Petroleum Hydrocarbons	EPA-8100-mod
Volatile solids	SM2540-G
Zinc	EPA 6010C

US-1 (Lab Number: 8G31046-01)

Analysis	Method
Arsenic	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Copper	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
Polynuclear Aromatic Hydrocarbons	EPA 8270D
Sieve/particle size analysis	By Subcontract
Total Petroleum Hydrocarbons	EPA-8100-mod
Volatile solids	SM2540-G
Zinc	EPA 6010C

US-2 (Lab Number: 8G31046-02)

Analysis	Method
Arsenic	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Copper	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric

Request for Analysis (continued)

US-2 (Lab Number: 8G31046-02) (continued)

Analysis	Method
Polynuclear Aromatic Hydrocarbons	EPA 8270D
Sieve/particle size analysis	By Subcontract
Total Petroleum Hydrocarbons	EPA-8100-mod
Volatile solids	SM2540-G
Zinc	EPA 6010C

US-3 (Lab Number: 8G31046-03)

Analysis	Method
Arsenic	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Copper	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
Polynuclear Aromatic Hydrocarbons	EPA 8270D
Sieve/particle size analysis	By Subcontract
Total Petroleum Hydrocarbons	EPA-8100-mod
Volatile solids	SM2540-G
Zinc	EPA 6010C

Method References

Method for the Determination of Extractable Petroleum Hydrocarbons, Rev. 1.1, Massachusetts Department of Environmental Protection, 2004

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

EPH

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

The sample "US-3" was reported with a surrogate recovery value that is outside of control limits due to sample matrix interfence.

Metals

All analyses were performed according to NETLAB's documented Standard Operating Procedures, within all required holding times, and with appropriate quality control measures. All QC was within laboratory established acceptance criteria. The samples were received, processed, and reported with no anomalies.

PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

Semi-volatile Compounds

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

Total Petroleum Hydrocarbons

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

Wet Chemistry

All samples were analyzed within method specified holding times and according to NETLAB's documented standard operating procedures.

Results: General Chemistry

Sample: US-1

Lab Number: 8G31046-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**77.5**		0.05	Percent	08/07/18	08/07/18
Volatile Solids	**1**		1	Percent	08/02/18	08/02/18

Results: General Chemistry

Sample: US-2

Lab Number: 8G31046-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**12.3**		0.05	Percent	08/07/18	08/07/18
Volatile Solids	**29**		1	Percent	08/02/18	08/02/18

Results: General Chemistry

Sample: US-3

Lab Number: 8G31046-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**21.0**		0.05	Percent	08/07/18	08/07/18
Volatile Solids	**10**		1	Percent	08/02/18	08/02/18

Results: General Chemistry

Sample: DS-1

Lab Number: 8G31046-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**77.1**		0.05	Percent	08/07/18	08/07/18
Volatile Solids	**1**		1	Percent	08/02/18	08/02/18

Results: Total Metals

Sample: US-1

Lab Number: 8G31046-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Arsenic	ND		0.85	mg/kg	08/01/18	08/02/18
Cadmium	**0.79**		0.42	mg/kg	08/01/18	08/02/18
Chromium	**0.44**		0.42	mg/kg	08/01/18	08/02/18
Copper	ND		1.70	mg/kg	08/01/18	08/02/18
Lead	**4.54**		0.42	mg/kg	08/01/18	08/02/18
Mercury	ND		0.090	mg/kg	08/01/18	08/01/18
Nickel	**0.48**		0.42	mg/kg	08/01/18	08/02/18
Zinc	**20.9**		1.7	mg/kg	08/01/18	08/02/18

Results: Total Metals

Sample: US-2

Lab Number: 8G31046-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Arsenic	**10.9**		5.47	mg/kg	08/01/18	08/02/18
Cadmium	**4.11**		2.73	mg/kg	08/01/18	08/02/18
Chromium	**15.0**		2.73	mg/kg	08/01/18	08/02/18
Copper	**12.6**		11.0	mg/kg	08/01/18	08/02/18
Lead	**104**		2.73	mg/kg	08/01/18	08/02/18
Mercury	ND		0.540	mg/kg	08/01/18	08/01/18
Nickel	**9.31**		2.73	mg/kg	08/01/18	08/02/18
Zinc	**148**		11.0	mg/kg	08/01/18	08/02/18

Results: Total Metals

Sample: US-3

Lab Number: 8G31046-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Arsenic	**5.13**		3.05	mg/kg	08/01/18	08/02/18
Cadmium	**2.85**		1.52	mg/kg	08/01/18	08/02/18
Chromium	**11.5**		1.52	mg/kg	08/01/18	08/02/18
Copper	**6.77**		6.15	mg/kg	08/01/18	08/02/18
Lead	**69.9**		1.52	mg/kg	08/01/18	08/02/18
Mercury	ND		0.316	mg/kg	08/01/18	08/01/18
Nickel	**5.68**		1.52	mg/kg	08/01/18	08/02/18
Zinc	**87.9**		6.1	mg/kg	08/01/18	08/02/18

Results: Total Metals

Sample: DS-1

Lab Number: 8G31046-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Arsenic	ND		0.84	mg/kg	08/01/18	08/02/18
Cadmium	**1.47**		0.42	mg/kg	08/01/18	08/02/18
Chromium	**0.79**		0.42	mg/kg	08/01/18	08/02/18
Copper	ND		1.69	mg/kg	08/01/18	08/02/18
Lead	**37.0**		0.42	mg/kg	08/01/18	08/02/18
Mercury	ND		0.089	mg/kg	08/01/18	08/01/18
Nickel	**1.32**		0.42	mg/kg	08/01/18	08/02/18
Zinc	**32.1**		1.7	mg/kg	08/01/18	08/02/18

Results: Semivolatile organic compounds

Sample: US-1

Lab Number: 8G31046-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2-Methylnaphthalene	ND		162	ug/kg	08/01/18	08/02/18
Acenaphthene	ND		162	ug/kg	08/01/18	08/02/18
Acenaphthylene	ND		162	ug/kg	08/01/18	08/02/18
Anthracene	ND		162	ug/kg	08/01/18	08/02/18
Benzo(a)anthracene	ND		162	ug/kg	08/01/18	08/02/18
Benzo(a)pyrene	ND		162	ug/kg	08/01/18	08/02/18
Benzo(b)fluoranthene	ND		162	ug/kg	08/01/18	08/02/18
Benzo(g,h,i)perylene	ND		162	ug/kg	08/01/18	08/02/18
Benzo(k)fluoranthene	ND		162	ug/kg	08/01/18	08/02/18
Chrysene	ND		162	ug/kg	08/01/18	08/02/18
Dibenz(a,h)anthracene	ND		162	ug/kg	08/01/18	08/02/18
Dibenzofuran	ND		162	ug/kg	08/01/18	08/02/18
Fluoranthene	ND		162	ug/kg	08/01/18	08/02/18
Fluorene	ND		162	ug/kg	08/01/18	08/02/18
Indeno(1,2,3-cd)pyrene	ND		162	ug/kg	08/01/18	08/02/18
Naphthalene	ND		162	ug/kg	08/01/18	08/02/18
Phenanthrene	ND		162	ug/kg	08/01/18	08/02/18
Pyrene	ND		162	ug/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*85.1%*	*30-126*	08/01/18	08/02/18
p-Terphenyl-d14	*87.6%*	*47-130*	08/01/18	08/02/18
2-Fluorobiphenyl	*83.4%*	*34-130*	08/01/18	08/02/18

Results: Semivolatile organic compounds

Sample: US-2

Lab Number: 8G31046-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2-Methylnaphthalene	ND		1010	ug/kg	08/01/18	08/02/18
Acenaphthene	ND		1010	ug/kg	08/01/18	08/02/18
Acenaphthylene	ND		1010	ug/kg	08/01/18	08/02/18
Anthracene	ND		1010	ug/kg	08/01/18	08/02/18
Benzo(a)anthracene	ND		1010	ug/kg	08/01/18	08/02/18
Benzo(a)pyrene	ND		1010	ug/kg	08/01/18	08/02/18
Benzo(b)fluoranthene	ND		1010	ug/kg	08/01/18	08/02/18
Benzo(g,h,i)perylene	ND		1010	ug/kg	08/01/18	08/02/18
Benzo(k)fluoranthene	ND		1010	ug/kg	08/01/18	08/02/18
Chrysene	ND		1010	ug/kg	08/01/18	08/02/18
Dibenz(a,h)anthracene	ND		1010	ug/kg	08/01/18	08/02/18
Dibenzofuran	ND		1010	ug/kg	08/01/18	08/02/18
Fluoranthene	ND		1010	ug/kg	08/01/18	08/02/18
Fluorene	ND		1010	ug/kg	08/01/18	08/02/18
Indeno(1,2,3-cd)pyrene	ND		1010	ug/kg	08/01/18	08/02/18
Naphthalene	ND		1010	ug/kg	08/01/18	08/02/18
Phenanthrene	ND		1010	ug/kg	08/01/18	08/02/18
Pyrene	ND		1010	ug/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*83.0%*	*30-126*	08/01/18	08/02/18
p-Terphenyl-d14	*78.5%*	*47-130*	08/01/18	08/02/18
2-Fluorobiphenyl	*81.4%*	*34-130*	08/01/18	08/02/18

Results: Semivolatile organic compounds

Sample: US-3

Lab Number: 8G31046-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2-Methylnaphthalene	ND		586	ug/kg	08/01/18	08/02/18
Acenaphthene	ND		586	ug/kg	08/01/18	08/02/18
Acenaphthylene	ND		586	ug/kg	08/01/18	08/02/18
Anthracene	ND		586	ug/kg	08/01/18	08/02/18
Benzo(a)anthracene	ND		586	ug/kg	08/01/18	08/02/18
Benzo(a)pyrene	ND		586	ug/kg	08/01/18	08/02/18
Benzo(b)fluoranthene	ND		586	ug/kg	08/01/18	08/02/18
Benzo(g,h,i)perylene	ND		586	ug/kg	08/01/18	08/02/18
Benzo(k)fluoranthene	ND		586	ug/kg	08/01/18	08/02/18
Chrysene	ND		586	ug/kg	08/01/18	08/02/18
Dibenz(a,h)anthracene	ND		586	ug/kg	08/01/18	08/02/18
Dibenzofuran	ND		586	ug/kg	08/01/18	08/02/18
Fluoranthene	ND		586	ug/kg	08/01/18	08/02/18
Fluorene	ND		586	ug/kg	08/01/18	08/02/18
Indeno(1,2,3-cd)pyrene	ND		586	ug/kg	08/01/18	08/02/18
Naphthalene	ND		586	ug/kg	08/01/18	08/02/18
Phenanthrene	ND		586	ug/kg	08/01/18	08/02/18
Pyrene	ND		586	ug/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*82.8%*	*30-126*	08/01/18	08/02/18
p-Terphenyl-d14	*70.6%*	*47-130*	08/01/18	08/02/18
2-Fluorobiphenyl	*83.3%*	*34-130*	08/01/18	08/02/18

Results: Semivolatile organic compounds

Sample: DS-1

Lab Number: 8G31046-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2-Methylnaphthalene	ND		166	ug/kg	08/01/18	08/02/18
Acenaphthene	ND		166	ug/kg	08/01/18	08/02/18
Acenaphthylene	ND		166	ug/kg	08/01/18	08/02/18
Anthracene	ND		166	ug/kg	08/01/18	08/02/18
Benzo(a)anthracene	**426**		166	ug/kg	08/01/18	08/02/18
Benzo(a)pyrene	**437**		166	ug/kg	08/01/18	08/02/18
Benzo(b)fluoranthene	**581**		166	ug/kg	08/01/18	08/02/18
Benzo(g,h,i)perylene	**217**		166	ug/kg	08/01/18	08/02/18
Benzo(k)fluoranthene	**223**		166	ug/kg	08/01/18	08/02/18
Chrysene	**471**		166	ug/kg	08/01/18	08/02/18
Dibenz(a,h)anthracene	ND		166	ug/kg	08/01/18	08/02/18
Dibenzofuran	ND		166	ug/kg	08/01/18	08/02/18
Fluoranthene	**727**		166	ug/kg	08/01/18	08/02/18
Fluorene	ND		166	ug/kg	08/01/18	08/02/18
Indeno(1,2,3-cd)pyrene	**250**		166	ug/kg	08/01/18	08/02/18
Naphthalene	ND		166	ug/kg	08/01/18	08/02/18
Phenanthrene	**201**		166	ug/kg	08/01/18	08/02/18
Pyrene	**643**		166	ug/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*94.3%*	*30-126*	08/01/18	08/02/18
p-Terphenyl-d14	*102%*	*47-130*	08/01/18	08/02/18
2-Fluorobiphenyl	*94.1%*	*34-130*	08/01/18	08/02/18

Results: Polychlorinated Biphenyls (PCBs)

Sample: US-1

Lab Number: 8G31046-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1221	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1232	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1242	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1248	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1254	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1260	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1262	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1268	ND		128	ug/kg	08/02/18	08/02/18

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*79.7%*	*43-100*	08/02/18	08/02/18
Decachlorobiphenyl (DCBP)	*81.8%*	*33-114*	08/02/18	08/02/18

Results: Polychlorinated Biphenyls (PCBs)

Sample: US-2

Lab Number: 8G31046-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1221	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1232	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1242	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1248	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1254	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1260	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1262	ND		800	ug/kg	08/02/18	08/02/18
Aroclor-1268	ND		800	ug/kg	08/02/18	08/02/18

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*64.8%*	*43-100*	08/02/18	08/02/18
Decachlorobiphenyl (DCBP)	*67.9%*	*33-114*	08/02/18	08/02/18

Results: Polychlorinated Biphenyls (PCBs)

Sample: US-3

Lab Number: 8G31046-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1221	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1232	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1242	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1248	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1254	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1260	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1262	ND		469	ug/kg	08/02/18	08/02/18
Aroclor-1268	ND		469	ug/kg	08/02/18	08/02/18

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*68.4%*	*43-100*	08/02/18	08/02/18
Decachlorobiphenyl (DCBP)	*63.0%*	*33-114*	08/02/18	08/02/18

Results: Polychlorinated Biphenyls (PCBs)

Sample: DS-1

Lab Number: 8G31046-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1221	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1232	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1242	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1248	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1254	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1260	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1262	ND		128	ug/kg	08/02/18	08/02/18
Aroclor-1268	ND		128	ug/kg	08/02/18	08/02/18

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*75.0%*	*43-100*	08/02/18	08/02/18
Decachlorobiphenyl (DCBP)	*80.1%*	*33-114*	08/02/18	08/02/18

Results: Total Petroleum Hydrocarbons

Sample: US-1

Lab Number: 8G31046-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		34	mg/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*62.5%*	*42.9-128*	08/01/18	08/02/18

Results: Total Petroleum Hydrocarbons

Sample: US-2

Lab Number: 8G31046-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	**833**		218	mg/kg	08/01/18	08/03/18

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*60.7%*	*42.9-128*	08/01/18	08/03/18

Results: Total Petroleum Hydrocarbons

Sample: US-3

Lab Number: 8G31046-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	**142**		123	mg/kg	08/01/18	08/02/18

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*63.8%*	*42.9-128*	08/01/18	08/02/18

Results: Total Petroleum Hydrocarbons

Sample: DS-1

Lab Number: 8G31046-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	**61**		34	mg/kg	08/01/18	08/03/18

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*82.1%*	*42.9-128*	08/01/18	08/03/18

Extractable Petroleum Hydrocarbons
Sample: US-1 (8G31046-01)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	US-1
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	8G31046-01
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	07/31/18
	Date Received	07/31/18
	Date Thawed	NA
	Date Extracted	08/01/18
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	22.50

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	16.8	mg/kg	<16.8	08/02/18 12:10
Diesel PAH Analytes	Naphthalene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	2-Methylnaphthalene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Phenanthrene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Acenaphthene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
Other Target PAH Analytes	Acenaphthylene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Fluorene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Anthracene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Fluoranthene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Pyrene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Benzo(a)anthracene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Chrysene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Benzo(b)fluoranthene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Benzo(k)fluoranthene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Benzo(a)pyrene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Indeno(1,2,3-cd)pyrene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Dibenz(a,h)anthracene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
	Benzo(g,h,i)perylene	1X	0.42	mg/kg	<0.42	08/02/18 12:10
C9-C18 Aliphatic Hydrocarbons [1]		1X	16.8	mg/kg	<16.8	08/02/18 12:38
C19-C36 Aliphatic Hydrocarbons [1]		1X	16.8	mg/kg	<16.8	08/02/18 12:38
C11-C22 Aromatic Hydrocarbons [1,2]		1X	16.8	mg/kg	<16.8	08/02/18 12:10
Chlorooctadecane (Sample Surrogate)				%	42.9	08/02/18 12:38
o-Terphenyl (Sample Surrogate)				%	51.7	08/02/18 12:10
2-Fluorobiphenyl (Fractionation Surrogate)				%	91.8	08/02/18 12:10
2-Bromonaphthalene (Fractionation Surrogate)				%	94.7	08/02/18 12:10
Surrogate Acceptance Range [3]					40 - 140%	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: US-2 (8G31046-02)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	US-2
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	8G31046-02
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	07/31/18
	Date Received	07/31/18
	Date Thawed	NA
	Date Extracted	08/01/18
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	87.70

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	105	mg/kg	<105	08/02/18 12:36
Diesel PAH Analytes	Naphthalene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	2-Methylnaphthalene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Phenanthrene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Acenaphthene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
Other Target PAH Analytes	Acenaphthylene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Fluorene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Anthracene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Fluoranthene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Pyrene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Benzo(a)anthracene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Chrysene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Benzo(b)fluoranthene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Benzo(k)fluoranthene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Benzo(a)pyrene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Indeno(1,2,3-cd)pyrene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Dibenz(a,h)anthracene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
	Benzo(g,h,i)perylene	1X	2.61	mg/kg	<2.61	08/02/18 12:36
C9-C18 Aliphatic Hydrocarbons [1]		1X	105	mg/kg	<105	08/02/18 13:02
C19-C36 Aliphatic Hydrocarbons [1]		1X	105	mg/kg	<105	08/02/18 13:02
C11-C22 Aromatic Hydrocarbons [1,2]		1X	105	mg/kg	<105	08/02/18 12:36
Chlorooctadecane (Sample Surrogate)				%	41.3	08/02/18 13:02
o-Terphenyl (Sample Surrogate)				%	45.0	08/02/18 12:36
2-Fluorobiphenyl (Fractionation Surrogate)				%	86.7	08/02/18 12:36
2-Bromonaphthalene (Fractionation Surrogate)				%	86.6	08/02/18 12:36
Surrogate Acceptance Range [3]					40 - 140%	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: US-3 (8G31046-03)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	US-3
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	8G31046-03
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	07/31/18
	Date Received	07/31/18
	Date Thawed	NA
	Date Extracted	08/01/18
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	79.00

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	61.2	mg/kg	<61.2	08/02/18 13:02
Diesel PAH Analytes	Naphthalene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	2-Methylnaphthalene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Phenanthrene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Acenaphthene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
Other Target PAH Analytes	Acenaphthylene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Fluorene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Anthracene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Fluoranthene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Pyrene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Benzo(a)anthracene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Chrysene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Benzo(b)fluoranthene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Benzo(k)fluoranthene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Benzo(a)pyrene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Indeno(1,2,3-cd)pyrene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Dibenz(a,h)anthracene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
	Benzo(g,h,i)perylene	1X	1.52	mg/kg	<1.52	08/02/18 13:02
C9-C18 Aliphatic Hydrocarbons [1]		1X	61.2	mg/kg	<61.2	08/02/18 13:26
C19-C36 Aliphatic Hydrocarbons [1]		1X	61.2	mg/kg	<61.2	08/02/18 13:26
C11-C22 Aromatic Hydrocarbons [1,2]		1X	61.2	mg/kg	<61.2	08/02/18 13:02
Chlorooctadecane (Sample Surrogate)				%	31.2	08/02/18 13:26
o-Terphenyl (Sample Surrogate)				%	40.4	08/02/18 13:02
2-Fluorobiphenyl (Fractionation Surrogate)				%	86.7	08/02/18 13:02
2-Bromonaphthalene (Fractionation Surrogate)				%	86.9	08/02/18 13:02
Surrogate Acceptance Range [3]					40 - 140%	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: DS-1 (8G31046-04)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	DS-1
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	8G31046-04
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	07/31/18
	Date Received	07/31/18
	Date Thawed	NA
	Date Extracted	08/01/18
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	22.90

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	16.3	mg/kg	<16.3	08/02/18 13:28
Diesel PAH Analytes	Naphthalene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	2-Methylnaphthalene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Phenanthrene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Acenaphthene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
Other Target PAH Analytes	Acenaphthylene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Fluorene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Anthracene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Fluoranthene	1X	0.40	mg/kg	**0.73**	08/02/18 13:28
	Pyrene	1X	0.40	mg/kg	**0.64**	08/02/18 13:28
	Benzo(a)anthracene	1X	0.40	mg/kg	**0.43**	08/02/18 13:28
	Chrysene	1X	0.40	mg/kg	**0.47**	08/02/18 13:28
	Benzo(b)fluoranthene	1X	0.40	mg/kg	**0.58**	08/02/18 13:28
	Benzo(k)fluoranthene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Benzo(a)pyrene	1X	0.40	mg/kg	**0.44**	08/02/18 13:28
	Indeno(1,2,3-cd)pyrene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Dibenz(a,h)anthracene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
	Benzo(g,h,i)perylene	1X	0.40	mg/kg	<0.40	08/02/18 13:28
C9-C18 Aliphatic Hydrocarbons [1]		1X	16.3	mg/kg	<16.3	08/02/18 13:50
C19-C36 Aliphatic Hydrocarbons [1]		1X	16.3	mg/kg	<16.3	08/02/18 13:50
C11-C22 Aromatic Hydrocarbons [1,2]		1X	16.3	mg/kg	<16.3	08/02/18 13:28
Chlorooctadecane (Sample Surrogate)				%	60.7	08/02/18 13:50
o-Terphenyl (Sample Surrogate)				%	61.6	08/02/18 13:28
2-Fluorobiphenyl (Fractionation Surrogate)				%	79.5	08/02/18 13:28
2-Bromonaphthalene (Fractionation Surrogate)				%	81.5	08/02/18 13:28
Surrogate Acceptance Range [3]					40 - 140%	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Quality Control

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0003 - Metals Digestion Soils										
Blank (B8H0003-BLK1)					Prepared & Analyzed: 08/01/18					
Cadmium	ND		0.33	mg/kg						
Arsenic	ND		0.66	mg/kg						
Zinc	ND		1.3	mg/kg						
Lead	ND		0.33	mg/kg						
Nickel	ND		0.33	mg/kg						
Copper	ND		1.33	mg/kg						
Chromium	ND		0.33	mg/kg						
LCS (B8H0003-BS1)					Prepared & Analyzed: 08/01/18					
Nickel	67.1		0.33	mg/kg	66.7		101	85-112		
Chromium	68.1		0.33	mg/kg	66.7		102	85-115		
Cadmium	66.3		0.33	mg/kg	66.7		99.4	85-115		
Copper	67.1		1.33	mg/kg	66.7		101	85-115		
Lead	66.6		0.33	mg/kg	66.7		99.9	85-115		
Zinc	72.3		1.3	mg/kg	66.7		108	85-115		
Arsenic	13.6		0.66	mg/kg	13.3		102	85-115		
Batch: B8H0010 - Metals Digestion Soils										
Blank (B8H0010-BLK1)					Prepared & Analyzed: 08/01/18					
Mercury	ND		0.071	mg/kg						
LCS (B8H0010-BS1)					Prepared & Analyzed: 08/01/18					
Mercury	0.970			ug/l	1.00		97.0	93-114		

Quality Control
(Continued)

Semivolatile organic compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0020 - EPA 3546										
Blank (B8H0020-BLK1)					Prepared: 08/01/18 Analyzed: 08/02/18					
2-Methylnaphthalene	ND		130	ug/kg						
Acenaphthene	ND		130	ug/kg						
Acenaphthylene	ND		130	ug/kg						
Anthracene	ND		130	ug/kg						
Benzo(a)anthracene	ND		130	ug/kg						
Benzo(a)pyrene	ND		130	ug/kg						
Benzo(b)fluoranthene	ND		130	ug/kg						
Benzo(g,h,i)perylene	ND		130	ug/kg						
Benzo(k)fluoranthene	ND		130	ug/kg						
Chrysene	ND		130	ug/kg						
Dibenz(a,h)anthracene	ND		130	ug/kg						
Dibenzofuran	ND		130	ug/kg						
Fluoranthene	ND		130	ug/kg						
Fluorene	ND		130	ug/kg						
Indeno(1,2,3-cd)pyrene	ND		130	ug/kg						
Naphthalene	ND		130	ug/kg						
Phenanthrene	ND		130	ug/kg						
Pyrene	ND		130	ug/kg						
Surrogate: Nitrobenzene-d5			*2870*	ug/kg	*3330*		*86.2*	*30-126*		
Surrogate: p-Terphenyl-d14			*3380*	ug/kg	*3330*		*102*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*2750*	ug/kg	*3330*		*82.4*	*34-130*		
LCS (B8H0020-BS1)					Prepared: 08/01/18 Analyzed: 08/02/18					
2-Methylnaphthalene	2940		130	ug/kg	3330		88.1	40-140		
Acenaphthene	2860		130	ug/kg	3330		85.9	40-140		
Acenaphthylene	2830		130	ug/kg	3330		84.8	40-140		
Anthracene	2960		130	ug/kg	3330		88.9	40-140		
Benzo(a)anthracene	3020		130	ug/kg	3330		90.7	40-140		
Benzo(a)pyrene	3100		130	ug/kg	3330		93.1	40-140		
Benzo(b)fluoranthene	3060		130	ug/kg	3330		91.9	40-140		
Benzo(g,h,i)perylene	3230		130	ug/kg	3330		97.0	40-140		
Benzo(k)fluoranthene	3090		130	ug/kg	3330		92.6	40-140		
Chrysene	3100		130	ug/kg	3330		93.1	40-140		
Dibenz(a,h)anthracene	3010		130	ug/kg	3330		90.4	40-140		
Dibenzofuran	2960		130	ug/kg	3330		88.7	40-140		
Fluoranthene	2940		130	ug/kg	3330		88.2	40-140		
Fluorene	3040		130	ug/kg	3330		91.2	40-140		
Indeno(1,2,3-cd)pyrene	3070		130	ug/kg	3330		92.2	40-140		
Naphthalene	2890		130	ug/kg	3330		86.6	40-140		
Phenanthrene	3000		130	ug/kg	3330		89.9	40-140		
Pyrene	3020		130	ug/kg	3330		90.5	40-140		
Surrogate: Nitrobenzene-d5			*3060*	ug/kg	*3330*		*91.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*3360*	ug/kg	*3330*		*101*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*2890*	ug/kg	*3330*		*86.7*	*34-130*		

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0020 - EPA 3546 (Continued)										
LCS Dup (B8H0020-BSD1)					Prepared: 08/01/18 Analyzed: 08/02/18					
2-Methylnaphthalene	3020		130	ug/kg	3330		90.7	40-140	2.95	30
Acenaphthene	2920		130	ug/kg	3330		87.6	40-140	1.96	30
Acenaphthylene	2890		130	ug/kg	3330		86.7	40-140	2.22	30
Anthracene	3060		130	ug/kg	3330		91.8	40-140	3.21	30
Benzo(a)anthracene	3190		130	ug/kg	3330		95.6	40-140	5.26	30
Benzo(a)pyrene	3310		130	ug/kg	3330		99.2	40-140	6.30	30
Benzo(b)fluoranthene	3290		130	ug/kg	3330		98.8	40-140	7.30	30
Benzo(g,h,i)perylene	3400		130	ug/kg	3330		102	40-140	5.01	30
Benzo(k)fluoranthene	3360		130	ug/kg	3330		101	40-140	8.36	30
Chrysene	3250		130	ug/kg	3330		97.5	40-140	4.70	30
Dibenz(a,h)anthracene	3150		130	ug/kg	3330		94.5	40-140	4.35	30
Dibenzofuran	3050		130	ug/kg	3330		91.5	40-140	3.06	30
Fluoranthene	3090		130	ug/kg	3330		92.8	40-140	5.08	30
Fluorene	3070		130	ug/kg	3330		92.2	40-140	1.13	30
Indeno(1,2,3-cd)pyrene	3220		130	ug/kg	3330		96.7	40-140	4.77	30
Naphthalene	2940		130	ug/kg	3330		88.3	40-140	1.97	30
Phenanthrene	3100		130	ug/kg	3330		93.1	40-140	3.52	30
Pyrene	3140		130	ug/kg	3330		94.2	40-140	3.99	30
Surrogate: Nitrobenzene-d5			*3010*	ug/kg	*3330*		*90.3*	*30-126*		
Surrogate: p-Terphenyl-d14			*3410*	ug/kg	*3330*		*102*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*2860*	ug/kg	*3330*		*85.7*	*34-130*		

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0018 - EPA 3546										
Blank (B8H0018-BLK1)					Prepared & Analyzed: 08/02/18					
Aroclor-1016	ND		100	ug/kg						
Aroclor-1221	ND		100	ug/kg						
Aroclor-1232	ND		100	ug/kg						
Aroclor-1242	ND		100	ug/kg						
Aroclor-1248	ND		100	ug/kg						
Aroclor-1254	ND		100	ug/kg						
Aroclor-1260	ND		100	ug/kg						
Aroclor-1262	ND		100	ug/kg						
Aroclor-1268	ND		100	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*10.5*	ug/kg	*13.3*		*78.4*	*43-100*		
Surrogate: Decachlorobiphenyl (DCBP)			*11.2*	ug/kg	*13.3*		*83.8*	*33-114*		
LCS (B8H0018-BS1)					Prepared & Analyzed: 08/02/18					
Aroclor-1016	157		100	ug/kg	167		94.4	59-125		
Aroclor-1260	150		100	ug/kg	167		90.0	57-119		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*11.0*	ug/kg	*13.3*		*82.3*	*43-100*		
Surrogate: Decachlorobiphenyl (DCBP)			*10.6*	ug/kg	*13.3*		*79.2*	*33-114*		
LCS Dup (B8H0018-BSD1)					Prepared & Analyzed: 08/02/18					
Aroclor-1016	181		100	ug/kg	167		108	59-125	13.9	20
Aroclor-1260	145		100	ug/kg	167		87.3	57-119	3.08	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*11.0*	ug/kg	*13.3*		*82.5*	*43-100*		
Surrogate: Decachlorobiphenyl (DCBP)			*10.8*	ug/kg	*13.3*		*80.8*	*33-114*		

Quality Control
(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0004 - EPA 3546										
Blank (B8H0004-BLK1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*8.13*	mg/kg	*8.33*		*97.6*	*42.9-128*		
LCS (B8H0004-BS1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Total Petroleum Hydrocarbons	532		27	mg/kg	667		79.8	40-115		
Surrogate: Chlorooctadecane			*7.30*	mg/kg	*8.33*		*87.6*	*42.9-128*		
LCS Dup (B8H0004-BSD1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Total Petroleum Hydrocarbons	493		27	mg/kg	667		73.9	40-115	7.60	200
Surrogate: Chlorooctadecane			*6.76*	mg/kg	*8.33*		*81.1*	*42.9-128*		

Quality Control
(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0019 - EPA 3546										
Blank (B8H0019-BLK1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		13.3	mg/kg						
Naphthalene	ND		0.33	mg/kg						
2-Methylnaphthalene	ND		0.33	mg/kg						
Phenanthrene	ND		0.33	mg/kg						
Acenaphthene	ND		0.33	mg/kg						
Acenaphthylene	ND		0.33	mg/kg						
Fluorene	ND		0.33	mg/kg						
Anthracene	ND		0.33	mg/kg						
Fluoranthene	ND		0.33	mg/kg						
Pyrene	ND		0.33	mg/kg						
Benzo(a)anthracene	ND		0.33	mg/kg						
Chrysene	ND		0.33	mg/kg						
Benzo(b)fluoranthene	ND		0.33	mg/kg						
Benzo(k)fluoranthene	ND		0.33	mg/kg						
Benzo(a)pyrene	ND		0.33	mg/kg						
Indeno(1,2,3-cd)pyrene	ND		0.33	mg/kg						
Dibenz(a,h)anthracene	ND		0.33	mg/kg						
Benzo(g,h,i)perylene	ND		0.33	mg/kg						
C9-C18 Aliphatic Hydrocarbons	ND		13.3	mg/kg						
C19-C36 Aliphatic Hydrocarbons	ND		13.3	mg/kg						
C11-C22 Aromatic Hydrocarbons	ND		13.3	mg/kg						
Surrogate: Chlorooctadecane			*4.32*	mg/kg	*8.33*		*51.9*	*40-140*		
Surrogate: o-Terphenyl			*5.02*	mg/kg	*8.33*		*60.3*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.06*	mg/kg	*3.33*		*91.9*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.17*	mg/kg	*3.33*		*95.0*	*40-140*		
LCS (B8H0019-BS1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Naphthalene	1.35		0.33	mg/kg	2.67		50.8	40-140		
2-Methylnaphthalene	1.51		0.33	mg/kg	2.67		56.7	40-140		
Phenanthrene	1.50		0.33	mg/kg	2.67		56.1	40-140		
Acenaphthene	1.57		0.33	mg/kg	2.67		58.8	40-140		
Acenaphthylene	1.48		0.33	mg/kg	2.67		55.3	40-140		
Fluorene	1.48		0.33	mg/kg	2.67		55.6	40-140		
Anthracene	1.53		0.33	mg/kg	2.67		57.2	40-140		
Fluoranthene	1.68		0.33	mg/kg	2.67		63.0	40-140		
Pyrene	1.70		0.33	mg/kg	2.67		63.9	40-140		
Benzo(a)anthracene	1.73		0.33	mg/kg	2.67		65.0	40-140		
Chrysene	1.86		0.33	mg/kg	2.67		69.7	40-140		
Benzo(b)fluoranthene	1.64		0.33	mg/kg	2.67		61.4	40-140		
Benzo(k)fluoranthene	1.85		0.33	mg/kg	2.67		69.4	40-140		
Benzo(a)pyrene	1.72		0.33	mg/kg	2.67		64.6	40-140		
Indeno(1,2,3-cd)pyrene	1.47		0.33	mg/kg	2.67		55.0	40-140		
Dibenz(a,h)anthracene	1.80		0.33	mg/kg	2.67		67.6	40-140		
Benzo(g,h,i)perylene	1.58		0.33	mg/kg	2.67		59.3	40-140		
Nonane	0.99		0.33	mg/kg	2.67		37.0	30-140		
Decane	1.29		0.33	mg/kg	2.67		48.3	40-140		
Dodecane	1.42		0.33	mg/kg	2.67		53.1	40-140		
Tetradecane	1.43		0.33	mg/kg	2.67		53.5	40-140		
Hexadecane	1.47		0.33	mg/kg	2.67		54.9	40-140		
Octadecane	1.59		0.33	mg/kg	2.67		59.7	40-140		
Nonadecane	1.64		0.33	mg/kg	2.67		61.4	40-140		
Eicosane	1.79		0.33	mg/kg	2.67		67.2	40-140		
Docosane	1.88		0.33	mg/kg	2.67		70.4	40-140		

Quality Control
(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B8H0019 - EPA 3546 (Continued)										
LCS (B8H0019-BS1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Tetracosane	1.94		0.33	mg/kg	2.67		72.7	40-140		
Hexacosane	1.96		0.33	mg/kg	2.67		73.4	40-140		
Octacosane	1.95		0.33	mg/kg	2.67		72.9	40-140		
Triacontane	1.91		0.33	mg/kg	2.67		71.6	40-140		
Hexatriacontane	1.83		0.33	mg/kg	2.67		68.7	40-140		
Surrogate: Chlorooctadecane			*4.22*	mg/kg	*8.33*		*50.6*	*40-140*		
Surrogate: o-Terphenyl			*4.89*	mg/kg	*8.33*		*58.7*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.84*	mg/kg	*3.33*		*85.2*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.82*	mg/kg	*3.33*		*84.6*	*40-140*		
LCS Dup (B8H0019-BSD1)					Prepared: 08/01/18 Analyzed: 08/02/18					
Naphthalene	1.48		0.33	mg/kg	2.67		55.5	40-140	8.80	25
2-Methylnaphthalene	1.61		0.33	mg/kg	2.67		60.6	40-140	6.48	25
Phenanthrene	1.62		0.33	mg/kg	2.67		60.6	40-140	7.71	25
Acenaphthene	1.65		0.33	mg/kg	2.67		62.0	40-140	5.34	25
Acenaphthylene	1.57		0.33	mg/kg	2.67		59.0	40-140	6.38	25
Fluorene	1.58		0.33	mg/kg	2.67		59.4	40-140	6.65	25
Anthracene	1.68		0.33	mg/kg	2.67		63.0	40-140	9.65	25
Fluoranthene	1.80		0.33	mg/kg	2.67		67.6	40-140	7.08	25
Pyrene	1.83		0.33	mg/kg	2.67		68.5	40-140	6.95	25
Benzo(a)anthracene	1.84		0.33	mg/kg	2.67		68.9	40-140	5.79	25
Chrysene	1.96		0.33	mg/kg	2.67		73.5	40-140	5.20	25
Benzo(b)fluoranthene	1.73		0.33	mg/kg	2.67		64.9	40-140	5.58	25
Benzo(k)fluoranthene	1.83		0.33	mg/kg	2.67		68.5	40-140	1.34	25
Benzo(a)pyrene	1.84		0.33	mg/kg	2.67		68.9	40-140	6.33	25
Indeno(1,2,3-cd)pyrene	1.53		0.33	mg/kg	2.67		57.4	40-140	4.27	25
Dibenz(a,h)anthracene	1.91		0.33	mg/kg	2.67		71.5	40-140	5.53	25
Benzo(g,h,i)perylene	1.67		0.33	mg/kg	2.67		62.5	40-140	5.30	25
Nonane	1.06		0.33	mg/kg	2.67		39.7	30-140	6.91	25
Decane	1.39		0.33	mg/kg	2.67		52.0	40-140	7.28	25
Dodecane	1.52		0.33	mg/kg	2.67		56.9	40-140	6.96	25
Tetradecane	1.52		0.33	mg/kg	2.67		57.0	40-140	6.34	25
Hexadecane	1.55		0.33	mg/kg	2.67		58.2	40-140	5.74	25
Octadecane	1.69		0.33	mg/kg	2.67		63.6	40-140	6.33	25
Nonadecane	1.77		0.33	mg/kg	2.67		66.3	40-140	7.71	25
Eicosane	1.91		0.33	mg/kg	2.67		71.5	40-140	6.16	25
Docosane	2.01		0.33	mg/kg	2.67		75.3	40-140	6.73	25
Tetracosane	2.08		0.33	mg/kg	2.67		78.1	40-140	7.23	25
Hexacosane	2.11		0.33	mg/kg	2.67		79.2	40-140	7.60	25
Octacosane	2.11		0.33	mg/kg	2.67		79.0	40-140	7.96	25
Triacontane	2.07		0.33	mg/kg	2.67		77.8	40-140	8.23	25
Hexatriacontane	1.96		0.33	mg/kg	2.67		73.6	40-140	6.88	25
Surrogate: Chlorooctadecane			*4.53*	mg/kg	*8.33*		*54.3*	*40-140*		
Surrogate: o-Terphenyl			*5.13*	mg/kg	*8.33*		*61.6*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.94*	mg/kg	*3.33*		*88.2*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.94*	mg/kg	*3.33*		*88.1*	*40-140*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

NEW ENGLAND TESTING LABORATORY, INC.
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

8 G 3 1046 Z

CHAIN OF CUSTODY RECORD

PROJ. NO.: 16226
PROJECT NAME/LOCATION: Wyoming Pond Dam
CLIENT: Parc Corporation
REPORT TO: nmcursman@parccorp.com
INVOICE TO: Accounting

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** As, Cd, Cr, Cu, Pb, Hg, Ni, Zn	PCBs	PAHs	TPH, EPH	Volatile Solids, Water %	Grain Size Analysis	REMARKS
7/31	9:30		X	US-1		X		2	N/A	X	X	X	X	X	X	
	10:00		X	US-2		X		2		X	X	X	X	X	X	
	10:30		X	US-3		X		2		X	X	X	X	X	X	
	11:00		X	~~US-4~~ DS-1		X		2		X	X	X	X	X	X	
				* Sample ID confirmed w/ Nathan 7/31 gd												

Sampled by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	9:00 7/31		
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	3:30 7/31	[signature]	7/31/18 1530
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time

Laboratory Remarks:
Temp. received: _____
Cooled ☐

Special Instructions:
List Specific Detection Limit Requirements:

Turnaround (Business Days)_____

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

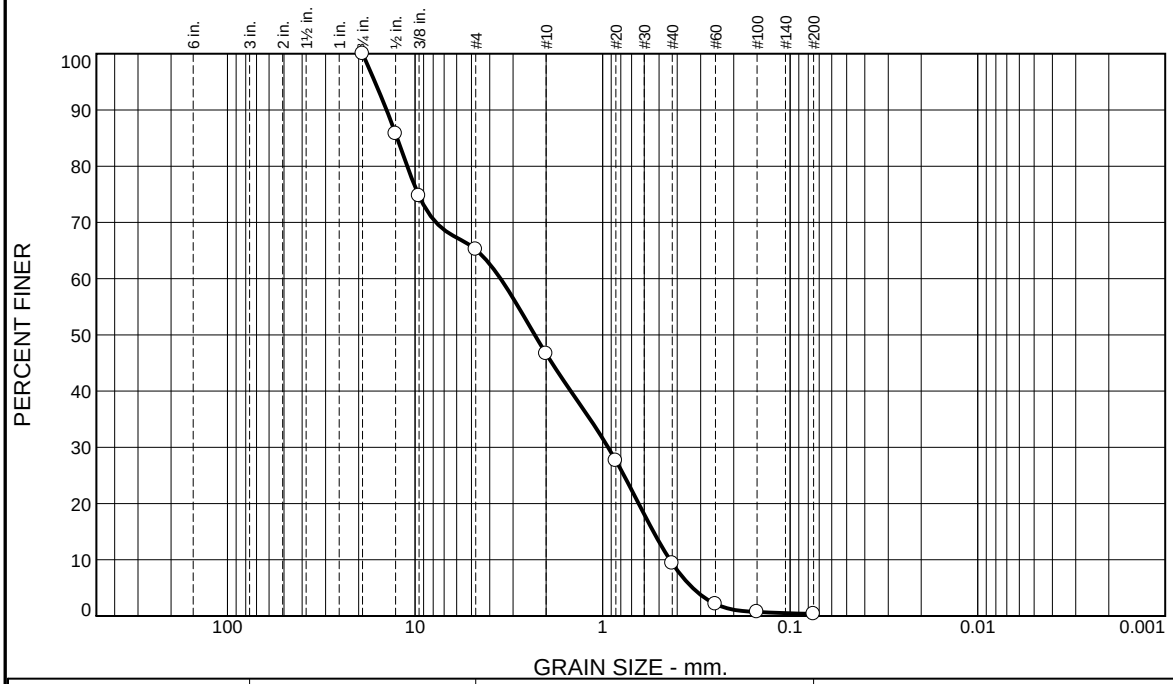
THIELSCH ENGINEERING	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 http://www.thielsch.com *Let's Build a Solid Foundation*	Client Information: New England Testing Laboratory West Warwick, RI PM: Karen Staple Assigned By: Karen Staple Collected By: Client	Project Information: **8G31046** NETL Project Number: 8G31046 Summary Page: 1 of 1 Report Date: 08.03.18

LABORATORY TESTING DATA SHEET

Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability (cm/sec)	
				D2216	D4318		D6913			D2874	D854			D1557			D1883			
	US-1		18-S-1113				34.8	64.8	0.4											Dark Brown poorly graded sand with gravel
	US-2		18-S-1114				0.0	66.3	33.7											Brown silty sand
	US-3		18-S-1115				0.0	63.6	36.4											Brown silty sand
	DS-1		18-S-1116				60.6	39.1	0.3											Brown poorly graded gravel with sand

Reviewed By _____ Date Reviewed 08.06.2018

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	34.8	18.6	37.2	9.0	0.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	85.8		
0.375"	74.7		
#4	65.2		
#10	46.6		
#20	27.6		
#40	9.4		
#60	2.1		
#100	0.7		
#200	0.4		

* (no specification provided)

Material Description

Dark Brown poorly graded sand with gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 14.1874 D_{85}= 12.4511 D_{60}= 3.5016
D_{50}= 2.3005 D_{30}= 0.9349 D_{15}= 0.5359
D_{10}= 0.4374 C_u= 8.01 C_c= 0.57

Remarks

Date Received: 08.01.18 **Date Tested:** 08.03.18

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Manager

Source of Sample: 8G31046
Sample Number: US-1

Date Sampled:

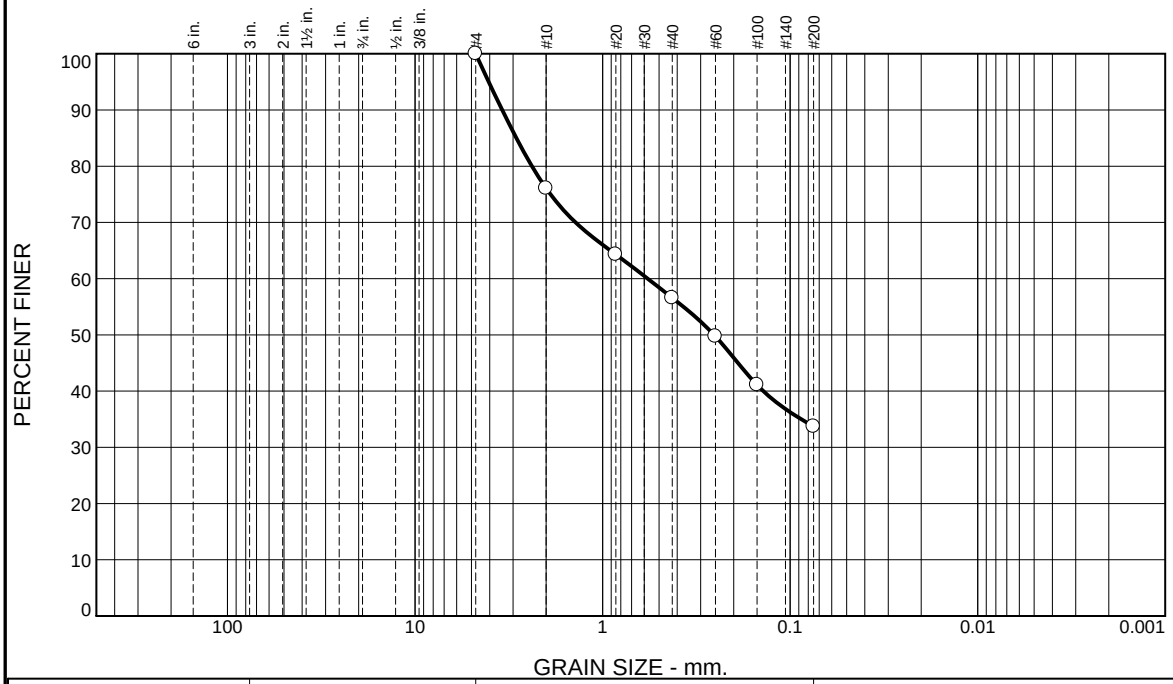
Thielsch Engineering Inc.

Cranston, RI

Client: New England Testing Laboratory
Project: 8G31046

Project No: 74-18-0002.46 **Figure** 18-S-1113

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	23.9	19.5	22.9	33.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	76.1		
#20	64.3		
#40	56.6		
#60	49.7		
#100	41.1		
#200	33.7		

* (no specification provided)

Material Description

Brown silty sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 3.4304 D_{85}= 2.8831 D_{60}= 0.5748
D_{50}= 0.2543 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 08.01.18 **Date Tested:** 08.03.18

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Manager

Source of Sample: 8G31046
Sample Number: US-2

Date Sampled:

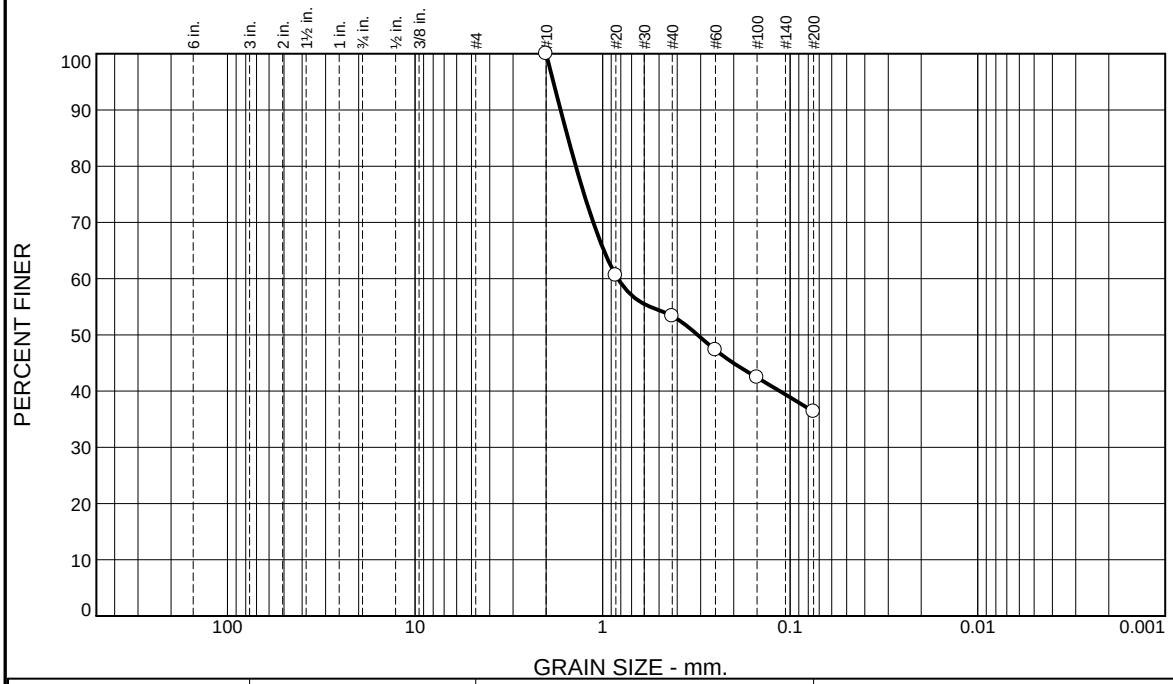
Thielsch Engineering Inc.

Cranston, RI

Client: New England Testing Laboratory
Project: 8G31046

Project No: 74-18-0002.46 **Figure** 18-S-1114

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	46.6	17.0	36.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	60.6		
#40	53.4		
#60	47.3		
#100	42.4		
#200	36.4		

* (no specification provided)

Material Description

Brown silty sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 1.6744 D_{85}= 1.5277 D_{60}= 0.8292
D_{50}= 0.3113 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 08.01.18 **Date Tested:** 08.03.18

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Manager

Source of Sample: 8G31046
Sample Number: US-3

Date Sampled:

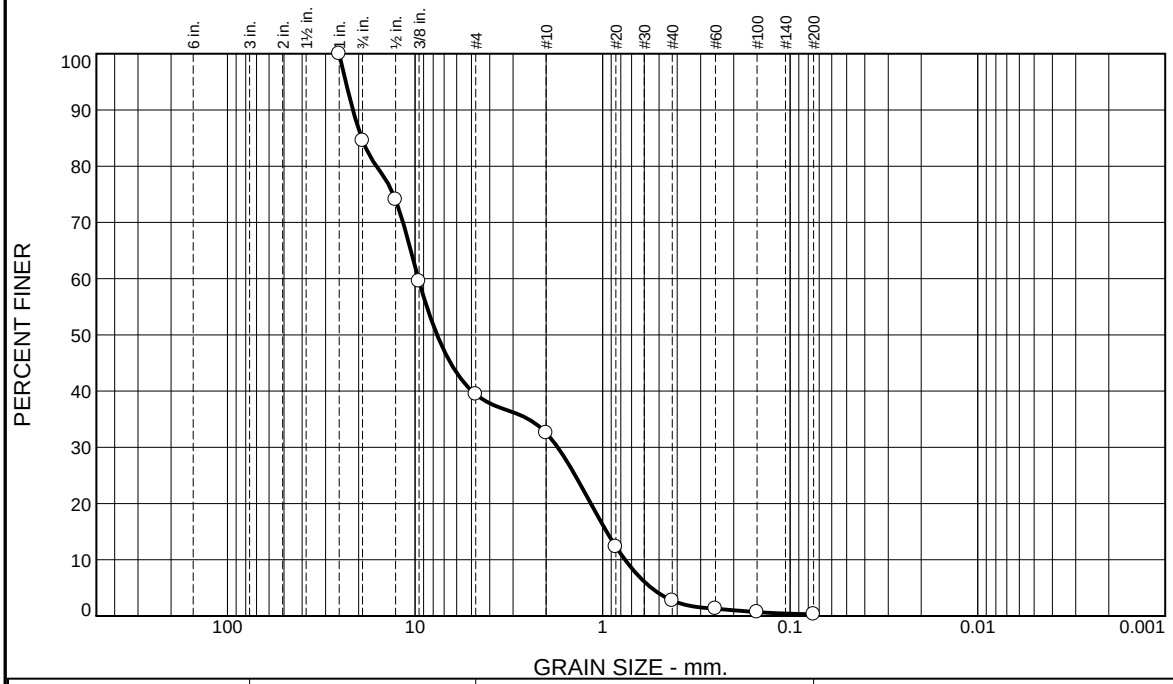
Thielsch Engineering Inc.

Cranston, RI

Client: New England Testing Laboratory
Project: 8G31046

Project No: 74-18-0002.46 **Figure** 18-S-1115

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.4	45.2	6.8	29.9	2.4	0.3	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	84.6		
0.5"	74.1		
0.375"	59.5		
#4	39.4		
#10	32.6		
#20	12.3		
#40	2.7		
#60	1.3		
#100	0.7		
#200	0.3		

* (no specification provided)

Material Description

Brown poorly graded gravel with sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GP **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 21.4399 D_{85}= 19.2683 D_{60}= 9.6096
D_{50}= 7.6278 D_{30}= 1.7351 D_{15}= 0.9520
D_{10}= 0.7597 C_u= 12.65 C_c= 0.41

Remarks

Date Received: 08.01.18 **Date Tested:** 08.03.18

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Manager

Source of Sample: 8G31046
Sample Number: DS-1

Date Sampled:

Thielsch Engineering Inc.

Cranston, RI

Client: New England Testing Laboratory
Project: 8G31046

Project No: 74-18-0002.46 **Figure** 18-S-1116

APPENDIX C – BORING LOGS

Pare Corporation
10 Lincoln Road, Suite 210
Foxboro, MA 02035
T: 508-543-1755
F: 508-543-1881

BORING NUMBER B19-1

CLIENT Rhode Island Department of Environmental Management
PROJECT NAME Wyoming Upper Reservoir Dam LLO Redesign
PROJECT NUMBER 16226.00
PROJECT LOCATION Richmond, RI
DATE STARTED 5/30/19 **COMPLETED** 5/30/19
GROUND ELEVATION 99.9 ft NAVD 88 **HOLE SIZE** 3-4 in.
DRILLING CONTRACTOR Northern Drill Service, Inc.
GROUND WATER LEVELS:
DRILLING METHOD See Note 4
AT TIME OF DRILLING 4.00 ft / Elev 95.90 ft
LOGGED BY BMD **CHECKED BY** DRC
AT END OF DRILLING 8.00 ft / Elev 91.90 ft
BORING LOCATION SEE BORING LOCATION PLAN

DEPTH (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in)	DEPTH (FT)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0		S-1	7 / 24	0 - 2	2-2-1-1 (3)			Moist, very loose, tan, fine to coarse SAND, some silt, little fine to coarse gravel.	4" LOAM
		S-2	8 / 24	2 - 4	2-2-1-2 (3)			Moist, very loose, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt.	SAND & GRAVEL FILL
5		S-3	4 / 24	4 - 6	2-1-2-2 (3)			Wet, very loose, brown, fine to coarse SAND and fine to coarse GRAVEL, little silt.	
		S-4	10 / 24	6 - 8	2-2-3-3 (5)			Wet, loose, brown, fine to coarse SAND, trace silt.	
10		S-5	5 / 24	8 - 10	8-5-26-8 (31)			Wet, loose, brown, fine to coarse SAND, little fine to coarse gravel, little silt.	
		S-6	10 / 24	12 - 14	7-3-7-8 (10)			Wet, loose, tan, fine to coarse SAND, trace fine to coarse gravel, trace silt.	
15		S-7	12 / 24	14 - 16	13-18-21-20 (39)			Wet, dense, gray, fine to coarse SAND and GRAVEL, little silt.	GLACIAL DEPOSITS
		S-8	10 / 24	17 - 19	11-15-15-14 (30)			Wet, medium dense, gray, fine to coarse GRAVEL, trace fine to coarse sand, trace silt.	
20		S-9	16 / 21	19 - 20.75	10-12-16-120/3"			Wet, medium dense, gray, fine to coarse GRAVEL, some fine to coarse sand, some silt.	
25		C-1	49 / 60	21 - 26		1:50 3:23 4:10 4:00 5:30		Black/white/pink, fresh, very hard to extremely hard, coarse grained HOPE VALLEY ALASKITE GNEISS. RQD = 82% REC = 49/60	HOPE VALLEY ALASKITE GNEISS
30								Bottom of borehole at 26.0 feet.	
35									

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	DENSITY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1. S-5: Relative density reduced to "loose" due to cobble located at 9'.
2. Boulder encountered at a depth of 9' is approximately 18" thick.
3. S-6: 1.5" stone in spoon and sample jar, do not include in sieve analysis.
4. Drilling methods - wash and drive 4" casing between 0'-8'. Wash and spin 3" casing to 21'.
5. Water return during "wash and spin" efforts typically amounted to less than the water added to the hole; however water return was never fully "lost".

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

Pare Corporation
10 Lincoln Road, Suite 210
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BORING NUMBER B19-2

CLIENT Rhode Island Department of Environmental Management
PROJECT NAME Wyoming Upper Reservoir Dam LLO Redesign
PROJECT NUMBER 16226.00
PROJECT LOCATION Richmond, RI
DATE STARTED 5/31/19 **COMPLETED** 5/31/19
GROUND ELEVATION 99 ft NAVD 88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR Northern Drill Service, Inc.
GROUND WATER LEVELS:
DRILLING METHOD See Note 4
AT TIME OF DRILLING 4.00 ft / Elev 95.00 ft
LOGGED BY BMD **CHECKED BY** DRC
AT END OF DRILLING 14.30 ft / Elev 84.70 ft
BORING LOCATION SEE BORING LOCATION PLAN

DEPTH (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in)	DEPTH (FT)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0									
		S-1	6 / 24	0 - 2	3-3-2-2 (5)			Moist, very loose, tan, fine to coarse SAND, some silt, little fine to coarse gravel.	3" TOPSOIL
		S-2	4 / 24	2 - 4	2-1-1-1 (2)			Moist, very loose, brown, fine to coarse SAND, little silt, trace fine to coarse gravel.	SAND & GRAVEL FILL
5		S-3	6 / 24	4 - 6	2-1-2-2 (3)			Wet, very loose, brown, fine to coarse SAND, some fine to coarse gravel, trace silt.	
10		S-4	4 / 24	9 - 11	1-0-2-1 (2)			Wet, very loose, brown, fine to coarse SAND, trace silt, trace fine to coarse gravel.	
									ORGANICS
								Probable Bedrock at 13'.	HOPE VALLEY ALASKITE GNEISS
15									
20									
25									
30									
35									

Bottom of borehole at 14.5 feet.

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	DENSITY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1. Reservoir water level noted to be approximately 2' below ground elevation of boring.
2. Advanced casing between 4' and 13' with rig (pushed) without the use of a hammer.
3. Brown wash with organic material (wood) encountered during wash and drive methods between depths 12'-13', most likely historic pond bottom.
4. Rollerbit advanced to a depth of 14.5' to confirm bedrock.
5. At approximately 14.5' below the ground surface, water within the casing dropped to 14.3' below the ground surface. Turbid water matching the color of the water in the casing was observed discharging into the downstream channel at the base of the downstream stone masonry wall.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

PARE BORING LOG - GINT STD US LAB.GDT - 7/8/19 13:50 - Y:\JOBS\16 JOBS\16226.00 RIDEM WYOMING UPPER RES DESIGN REPAIRS-RI\BORING LOGS\16226.00 BORING LOGS.GPJ

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BORING NUMBER B19-3

CLIENT Rhode Island Department of Environmental Management
PROJECT NAME Wyoming Upper Reservoir Dam LLO Redesign
PROJECT NUMBER 16226.00
PROJECT LOCATION Richmond, RI
DATE STARTED 5/30/19 **COMPLETED** 5/31/19
GROUND ELEVATION 96.9 ft NAVD 88 **HOLE SIZE** 3-4 in.
DRILLING CONTRACTOR Northern Drill Service, Inc.
GROUND WATER LEVELS:
DRILLING METHOD See Note 3
AT TIME OF DRILLING --- N/A
LOGGED BY BMD **CHECKED BY** DRC
AT END OF DRILLING 10.00 ft / Elev 86.90 ft
BORING LOCATION SEE BORING LOCATION PLAN

DEPTH (ft)	CASING (bl/ft)	SAMPLE TYPE NUMBER	RECOVERY/PEN. (in)	DEPTH (FT)	BLOW COUNTS/6"	MIN/FT	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0									
5									
10									
15									
								Bedrock at 15'. White/black/pink flakes in wash return.	HOPE VALLEY ALASKITE GNEISS
								Bottom of borehole at 18.0 feet.	
20									
25									
30									
35									

GRANULAR SOILS

BLOWS/FT	DENSITY
0 - 4	V. LOOSE
4 -10	LOOSE
10 - 30	M. DENSE
30 - 50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/FT	DENSITY
<2	V. SOFT
2 - 4	SOFT
4 - 8	M. STIFF
8 - 15	STIFF
15 - 30	V. STIFF
>30	HARD

REMARKS:
1.No samples collected. Hole drilled for bedrock confirmation only.
2.Tan to gray, fine to coarse sand in wash return between 0'-15'.
3.Drilling methods - wash and drive 4" casing between 0'-15', wash and spin 3" casing to 15.5'.
4.Rollerbit advanced to a depth of 18' for bedrock confirmation.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.