



PN: 16819

June 7, 2013

Mr. Kevin Heine
US Environmental Protection Agency
5 post Office Square
Boston, Massachusetts 02109-3912

RE: Residential Water Supply System
Disposal Specialists, Inc. Landfill, Rockingham, Vermont

Dear Mr. Heine:

In conjunction with other Investigation Plan tasks and as requested by EPA, Browning Ferris Industries (BFI) and Summit Environmental Consultants, Inc. (Summit) have undertaken a review of the existing water supply system used to provide potable water to four residential properties located east-northeast of the closed Disposal Specialists, Inc. (DSI) Landfill in Rockingham, Vermont. The water supply also serves the property at 890 Missing Link Road (referred to as the "Greenwood" residence in historical correspondence) located south of the closed landfill and the closed Facility Office/Maintenance garage.

The review of the water system included both a regulatory review and physical evaluation of the system. As a result of this evaluation, an Operations and Maintenance (O&M) Manual has been developed as a tool to more formally inspect, maintain and manage the system. A copy of the O&M Manual is attached.

Water System History

The system was installed by BFI in response to water quality impacts observed downgradient of the DSI landfill. The water supply system is considered part of the Protective Measures instituted by BFI at the Site and has been incorporated into the overall Site remedy approved by EPA.

The water supply system was initially installed in 1983 using Well #2 and upgraded with the installation of a second supply well (Well #3) in 1994. Well #2 is referred to as the "Greenwood/Facility" well in recent sampling reports and Well #3 is called the "Missing Link" well. Refer to Figure 1 titled "Water System Map" showing the source location, main water line location, valve, curb stops and service connections contained in Appendix A of the O&M Manual. Well completion logs are included in the O&M Manual for reference. Both supply wells are located on the 890 Missing Link Road property that is owned by BFI. The water supply serves the following properties:

MAIN OFFICE: LEWISTON
1840 Main Street
Lewiston, ME 04240
207.795.6009 voice
207.795.6128 fax

AUGUSTA
434 Cony Road
Augusta, ME 04330
207.621.8334 voice
207.626.9094 fax

BANGOR
8 Harlow Street, Suite 4A
Bangor, ME 04401
207.262.9040 voice
207.262.9080 fax

890 Missing Link road	Parcel 4-505-890
Banholzer (River Front Dr.)	Parcel 4-107-014
Johnson (River Front Dr.)	Parcel 4-107-012
Strickland/Glynn (River Front Dr.)	Parcel 4-107-010
Rumrill (River Front Dr.)	Parcel 4-107-008
Closed Facility Office/Maintenance Garage	Parcel 4-505-894

Well #2 is the Primary supply well and Well #3 is the Backup supply. Note that the existing conveyance lines (mains) from the Primary and Backup supply wells initially enter the basement of the home at 890 Missing Link Road where electrical controls, pressure tanks and treatment units are located. The supply line main exits the basement eastward toward State Route 5 (Missing Link Road), then runs parallel to and along the western side of State Route 5. The supply line then crosses State Route 5 north of a shallow groundwater trench drain system along State Route 5 and serves three parcels on River Front Drive.

The supply main is a 2-inch diameter polyethylene plastic pipe with several isolation valves along its length. Curb stops are present at each of the residences on River Front Drive and a "blow-off" hydrant has been installed at the north end of the main line in 2013 to facilitate flushing of the supply line (refer to Water System Map and Water System Details in Appendix A of the O&M Manual).

Analytical data for water supply samples are included in the Long-Term Monitoring Program database established as part of the Record of Decision (ROD) for the Site.

Water System Evaluation

The Federal Safe Drinking Water Act is administered by the Vermont Department of Environmental Conservation (VT DEC) when the state has primary administrative authority ("primacy"). Water supply in the State of Vermont is regulated in accordance with Chapter 21, Water Supply Rule of the VT DEC Environmental Protection Rules. Based on review of this rule and discussions with VT DEC, the water supply servicing these four parcels is classified as a Non-Public Water System not requiring a state permit due to the limited number of users and system connections.

However, The United States Environmental Protection Agency (EPA), has requested verification that the water supply system substantially meets current state and federal requirements for use as a public, multi-user water supply system.

To address EPA's request, a systematic review of the water system was undertaken.

Physical Layout

As shown on the figures in the O&M Manual, both supply wells are located on property owned by

BFI located south of the closed landfill. A visual inspection of the conveyance piping, valves, control systems, sampling ports, pressure tanks and pumps was completed by Blue Granite Consulting, Inc., Summit, and Cushing and Sons Well and Water Company (Cushing). As a result of these inspections, the following improvements were made in 2012-2013:

- new pressure tanks were installed to maintain more consistent system pressure,
- conveyance lines and sampling ports were labeled for easy reference,
- several valves were replaced and piping was reconfigured to allow for easier transition between primary and backup supply wells,
- A "blow-off" or flushing hydrant was installed at the north terminus of the supply Main, and
- Isolation valves and curb stops were located and checked for proper operation.

Water system diagrams were prepared and are included in the O&M Manual.

Analytical Data

Historically sampling of the water supply source was included in semi-annual groundwater sampling events conducted as part of the Long-Term Monitoring Plan for the Site. The sampling was focused on constituents of concern related to the former landfill operation (i.e., VOCs and select inorganic compounds).

As part of the water system evaluation, a more traditional set of water quality parameters was selected for analysis and samples were collected from outdoor spigots at each of the residences being served by the water supply system. The initial round of samples was collected on September 11, 2012 and submitted to Test America Laboratory in Buffalo, New York for analysis. Analytical results from the September 11, 2012 sampling reported positive detections for total coliform and elevated concentrations of iron, manganese and arsenic in the samples collected from the residences.

Based on these initial results, BFI verified the results with the laboratory, discussed the results with the residents, arranged for the supply system to be flushed and disinfected, and provided bottled water to the residents. During the first week of November, 2012, Cushing initiated flushing and disinfection of the water supply system, from the source wells to end user locations (i.e., residences on River Front Drive). The system was disinfected using a chlorine solution. Solution was added to the wells and circulated throughout the system. Chlorine concentrations were measured at various locations throughout the system to ensure that chlorinated water was present. The system was shut down overnight to allow a minimum of 18 hours of contact time. The following day, the system was flushed by opening an outdoor spigot at the last residence served by the water supply line. Water flushed from the system was containerized and disposed in the landfill leachate system until chlorine concentrations fell below 1 ppm. Flushing continued until chlorine concentrations were Not Detected (ND) at all locations including faucets in the resident's homes. It was estimated that a total of approximately 3,000 gallons of water was flushed through the system.

Samples from the source wells and residences were collected on November 8, 2013 and submitted to Eastern Analytical, Inc. in Concord, New Hampshire. [Note that one of the supply wells was sampled on November 20 due to a detectable residual chlorine concentration measured on November 8.] Results reported that coliform was absent and that arsenic, iron and manganese concentrations at the residences had declined substantially, but were reported above the concentrations in the primary supply well. These data indicated that metals concentrations were being influenced by conditions within the supply main.

In order to more efficiently flush the supply lines, a "blow-off" hydrant was installed at the end of the main 2-inch water supply line immediately beyond the curb stop for the last residence (Glynn). Following installation of the blow-off hydrant, the main line was flushed in an attempt to remove particulate that may have accumulated within the main line.

Following flushing of the main line, another round of samples was collected from source wells and residences on December 13, 2012. The December round included both a filtered and unfiltered sample to assess whether particulates in the main line may be affecting water quality results. Results from the December 13, 2013 sampling showed that concentrations reported for the unfiltered samples for iron, arsenic and manganese generally declined slightly, but were similar to the November sampling results. However, results reported for the filtered sample were significantly lower and arsenic was reported below the Primary Drinking Water Standard of 10 ug/l at all locations with the exception of the backup well (11 ug/l).

These results continued to indicate that particulate in the water system was influencing water quality results. In response to these data, BFI instructed Cushing to update the water system by replacing pressure tanks, installing an arsenic treatment system for the backup supply well, installing a particulate filter in the primary supply line and installing particulate filters in each of the residences. These activities were completed in January and February 2013.

Following the system upgrades, another round of sampling was completed on March 8, 2013. Pre and post treatment samples were collected from the source wells and samples were also collected from the blow-off hydrant (designated mainline #2), and two of the residences (Banholzer and Johnson). Water had been shut off for the winter at the Glynn property.

Results show that arsenic concentrations in post treatment samples from the source wells and the residential samples are below the Drinking Water Standard and that no further restriction on use is needed. Bottled water delivery will be discontinued. An analytical data summary table is attached for reference.

In April 2013, Howard Rumrill (parcel 4-107-008) contacted BFI to notify them that his water supply was not functioning. The Rumrill residence has historically been supplied from a spring located on BFI property to the north of the landfill. Water is conveyed from the spring, down a steep slope, under State Route 5 and ultimately to the Rumrill residence by a buried polyethylene pipe. Investigation of the Spring in response to Rumrill's notification showed that

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significant flow from the spring was occurring, but that several feet of sediment had accumulated in the vicinity of the intake of the conveyance line and appears to have plugged the conveyance line.

Following a discussion with and approval by Mr. Rumrill, BFI determined that the most efficient solution would be to extend the existing water line to the Rumrill property. From April 24 to April 26, 2013, St. Pierre Construction extended the water line to the Rumrill residence and relocated the "blow-off" hydrant to the end of the 2-inch main on the Rumrill property. In conjunction with the water line extension, Cushing checked the plumbing system in the Rumrill residence for evidence of leakage, repaired a leaky faucet and installed a sediment filter similar to the residences previously on the system. The extended portion of the water line was chlorinated and flushed prior to final connections.

BFI plans to institute a more frequent and formalized flushing process for the main supply line (as detailed in the O&M Plan) and the residents will be added to the semi-annual sampling program (arsenic and manganese only) to assess continued performance of the system upgrades.

Summary

Water supply in the State of Vermont is regulated in accordance with Chapter 21, Water Supply Rule of the VT DEC Environmental Protection Rules. Based on review of this rule and discussions with VT DEC, the waterline from the Site servicing these four parcels are classified as a Non-Public Water System not requiring a state permit due to the limited number of users and system connections. However, as described above and documented in the O&M Manual, the water supply system substantially meets current state and federal requirements for use as a public, multi-user water supply system.

If you have any questions about this letter or the O&M Manual, please feel free to contact us.

Sincerely,
SUMMIT ENVIRONMENTAL CONSULTANTS, INC.

Michael A. Deyling, C.G., P.Hg.
Principal Hydrogeologist

Cc: Ralph Larimore, BFI
Joe Montello, BFI
Roger Bellerose, BGCI

Attachment

DSI Landfill - Rockingham, VT
Water Supply System Sampling Results

		Backup Supply Well					Banholzer				Glynn				Johnson				Primary Supply well(1)				Mainline #2 (hydrant)	
		pretreat post treat																	pretreat post treat					
Parameter	Units	9/11/12	11/20/12	12/13/12	3/6/13	3/6/13	9/11/12	11/8/2012	12/13/12	3/8/13	9/11/12	11/8/2012	12/13/12	3/6/13**	9/11/12	11/8/2012	12/12/12	3/6/13	11/8/2012	12/13/12	3/6/13	3/6/13	12/13/12	3/6/13
Arsenic	UG/L	16.4	82	55	44	<1.0	82.8	24	49	3	226	12	12	NS	224	34	7	4	1	<1	<1	<1	25	28
Arsenic (filtered)	UG/L	NS	NS	11	NS	NS	NS	NS	9	NS	NS	NS	4	NS	NS	NS	4	NS	NS	<1	NS	NS	4	NS
Chloride	MG/L	2.1	NS	NS	NS	NS	2.3	NS	NS	NS	2.1	NS	NS	NS	2.2	NS	NS	NS	NS	NS	NS	NS	NS	NS
Coliform, Total	CFU/100ML	Positive	absent	NS	NS	NS	Positive	<1.1	NS	NS	Positive	<1.3	NS	NS	Positive	absemt	NS	NS	<1.3	NS	NS	NS	NS	NS
Iron	UG/L	732 V	3700	1600	NS	NS	2300 V	660	1300	NS	6100 V	280	250	NS	6330 V	1,300	<50	NS	230	<50	NS	NS	890	NS
Iron (filtered)	UG/L	NS	NS	<50	NS	NS	NS	NS	<50	NS	NS	NS	<50	NS	NS	NS	<50	NS	NS	<50	NS	NS	<50	NS
Manganese	UG/L	43.4 V	22	140	110	<5	78 V	7	28	<5	186 V	<5	<5	NS	135 V	8	<5	<5	6	<5	<5	<5	44	32
Manganese (filtered)	UG/L	NS	NS	120	NS	NS	NS	NS	<5	NS	NS	NS	<5	NS	NS	NS	<5	NS	NS	<5	NS	NS	<5	NS
Nitrate	MG/L AS N	0.093	NS	NS	NS	NS	0.05 U	NS	NS	NS	0.06	NS	NS	NS	0.11	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrite as N	MG/L	0.05 U	NS	NS	NS	NS	0.05 U	NS	NS	NS	0.05 U	NS	NS	NS	0.05 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	UG/L	6970	NS	NS	NS	NS	5390	NS	NS	NS	6900	NS	NS	NS	6080	NS	NS	NS	NS	NS	NS	NS	NS	NS

Note:
(1) Primary Well designated as "Greenwood" Well or Mainline 1 on lab sheets
all Coliform test results were negative for ecoli
V = Serial Dilution exceeds the control limits
U = Not detected at detection limit shown
NS = Not Sampled
Chlorination and flushing of line prior to 11/8/2012 sampling event
** Water shut off for the winter, no sample collected
Backup Supply Well is designated "water supply well" on lab sheets
Mainline #2 is new hydrant at end of main line near Glynn property. Sample taken with Primary well on-line. Hydrant subsequently moved to Rumrill property.

**DSI ROCKINGHAM LANDFILL MISSING LINK ROAD
NON-PUBLIC WATER SUPPLY SYSTEM
ROUTE 5
ROCKINGHAM, VERMONT**

Operations and Maintenance Manual

Prepared for:

Browning Ferris Industries of Vermont
5600 Niagara Falls Boulevard
Niagara Falls, New York 14304-1532

Prepared by:

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May 2013

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Preface

This Water Supply system Operation and Maintenance (O&M) Manual was developed by Browning Ferris Industries of Vermont (BFI) consistent with the requirement of the Vermont Water Supply Rule (WSR), Subchapter 21-7. The document should be updated as needed to reflect changes in Site conditions, regulatory status or system performance. Revision dates should be shown on the cover page.

The purpose of the O&M Manual is to provide guidance for proper operation of the BFI water supply system currently serving the closed office/maintenance garage, a property at 890 Missing Link Road (Route 5) and four residential properties located on River Front Drive east of the Disposal Specialists, Inc. (DSI) Site in Rockingham, Vermont.

I. General System Description

Two sources for the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply system are present at the Site and include:

1. Source: – Primary Supply Well #2 located on Parcel 4-505-858. Historically identified as the "Greenwood/Facility Well"
Type: Drilled Bedrock Well
Constructed: 1980s
2. Source: – Backup Well #3 located on Parcel 4-505-858. Historically identified as The "Supply Well" or "Missing Link Well"
Type: Drilled Bedrock Well
Constructed: 1994

Figure 1 titled "Water System Map" showing the source location, main water line location, valve, curb stops and service connections is contained in Appendix A,

Figure 2, titled "Water System Detail" shows the lower section of the system including the sample station/blow off (Appendix A).

A schematic drawing of the raw water pre-treatment, storage and distribution system located within the basement of the residence at 890 Missing Link Road is contained in Appendix B, titled "Water System Supply Schematic" (Figure 3).

Background

The closed DSI Rockingham Landfill (the "Site") consists of a 17-acre solid waste landfill and the surrounding areas of impacted ground water attributable to the Site. The Site has been investigated and remediated by BFI with oversight by the United States Environmental Protection Agency (EPA, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Included in the remedial actions are the implementation and maintenance of institutional controls to prevent groundwater use within the area of Site-related contamination. The Site currently provides and maintains a drinking water supply to four residential properties located east of the Site on River Front Drive, a property at 890 Missing Link Road and to the closed Office/Maintenance building at the site. This water supply system is designated the DSI (non-public) Missing Link Road Water Supply System.

The water supply system was initially installed in the 1980's and upgraded with the installation of a second supply well in 1994. The water line serves the following properties:

890 Missing Link Rd.	Parcel 4-505-890
Banholzer	Parcel 4-107-014
Johnson	Parcel 4-107-012
Strickland/Glynn	Parcel 4-107-010
Rumrill	Parcel 4-107-008
Closed Facility Office/Maintenance Garage	Parcel 4-505-894

The Federal Safe Drinking Water Act is administered by the VTDEC when the state has primary administrative authority ("primacy"). Water supply in the State of Vermont is regulated in accordance

with Chapter 21, Water Supply Rule of the VT DEC Environmental Protection Rules. Based on review of this rule and discussions with VT DEC, the waterline from the Site servicing these four parcels are classified as a Non-Public Water System not requiring a state permit due to the limited number of users and system connections. However, EPA, has requested verification that the water supply system substantially meets current state and federal requirements for use as a public, multi-user water supply system; hence, development of this O&M Manual.

As shown below, the supply well location meets or exceeds current setback distances as defined in Table A11-1 in Appendix A of the Vermont Water Supply Rule.

<u>Potential Contamination Source</u>	<u>Setback (approximate)</u>	<u>Minimum Distance</u>
Roadway (Route 5)	140 Feet	25 Feet
Driveway	420 Feet	15 Feet
Septic System Disposal Field	550 Feet	200 Feet
Subsurface Wastewater Piping/Tanks	500 Feet	50 Feet
Property Line	25 Feet	10 Feet
Surface Water (Pond on Site)	500 Feet	10 Feet
Buildings	475 Feet	10 Feet
Hazardous or Solid Waste Disposal Site	680 Feet (side gradient/Upgradient)	

Note that the existing conveyance lines (mains) initially enter the basement of the home at 890 Missing Link Road where electrical controls, pressure tanks and treatment units are located. [A separate conveyance line runs from the primary well to the closed Facility Office/Maintenance Grage.] The supply line main exits the residence eastward toward State Route 5 (Missing Link Road), then runs parallel to and upgradient of a shallow groundwater trench drain located along the western side of State Route 5 (refer to Water System Map and Water System Details (Appendix A)). The supply line crosses State Route 5 north of the trench drain and serves four parcels on River Front Drive.

Raw Water Treatment

The raw (source) water from Well # 2 is conveyed through a particulate filter system prior to distribution as shown on the water supply detail sheet. Source water from Well #3 is conveyed through an iron and arsenic treatment system prior to entering the distribution system. Individual particulate filters are also installed in each of the residences being served by the system.

Water quality testing of the supply wells is conducted on an annual basis as part of a Site-wide long-term water quality monitoring program established by EPA and VTDEC. Refer to Appendix H of this O&M for source testing frequency, methods and water quality parameters.

Treatment/Filter Type	Supplier	Specification
Primary Supply Well Particulate	Culligan Medallist	12-inch system 10 micron
Backup Well Arsenic	Culligan	10-inch system Gold Series
Backup Well Iron	Culligan	IC-12
Residential Particulate	20-Inch BB	1 micron

System Pressure

Pressure in the distribution system is maintained and regulated by a pressure tank located in the basement of the home at 890 Missing Link Road. Routine maintenance for this system is discussed in further detail in Section IV – Normal Operations.

Pressure Tank Summary Table

Pressure Tank	Tank Size	Low/high Pressure (psi)
WX-251	86 Gallons	30 / 40

Distribution System

The water distribution system consists of a 2 inch diameter plastic pipe (the main) extending approximately 1,900 linear feet from the 890 Missing Link Road property north along Route 5 (Missing Link Road) to residents on River Front Drive. The main is isolated by four valves designed V-1 through V-4. Refer to Figure 1 for approximate location of the isolation valves.

The distribution system currently provides potable water to the closed Facility Office/Maintenance garage, 890 Missing Link road and four residences on river Front Drive via service connection with individual curb stops; Banholzer, Johnson, Rumrill and Glynn.

Source Protection Area

The source protection area for the groundwater supply well has been delineated and is described in the system Source Protection Plan (SPP). A SPP identifies the potential sources of contamination in a specific land surface area, assesses the risks of these potential sources of contamination, describes how to manage the risk from the potential sources of contamination, and discusses how to handle simple emergencies that may be associated with inadequate source water quality or quantity. Activities within the protection area are managed by BFI via the SPP to minimize activities that may have an adverse effect on the drinking water source. Any activity within the source area isolation zone which may pose a risk to source water quality is restricted and/or managed in a manner that minimizes the risk to source water quality. A copy of the site specific SPP is attached as Appendix C.

II. System Map

A current and periodically updated system map makes routine, as well as emergency maintenance on a water system significantly easier. A system-wide map of the distribution system is included in Appendix A. This map is a representation of system components including valves, curb stops, and connections. The following table identifies and describes items shown on the Water System Map (Figure 1):

Item	Description	Function
Valve V-1	2 inch Gate Valve	Isolates main between source and Route 5
Valve V-2	2 inch Gate Valve	Isolates southern 231 foot section of main north of V-1
Valve V-3	2 inch Gate Valve	Isolates approximately 800 foot section of main north of V-2, immediately after main crosses beneath Route 5.
Valve V-4	2 inch Gate Valve	Isolates northern section of main prior to service connections
CS-1	Curb Stop	Shuts off water supply to Banholzer residence
CS-2	Curb Stop	Shuts off water supply to Johnson residence
CS-3	Curb Stop	Shuts off water supply to Strickland/Glynn residence
CS-4	Curb Stop	Shuts off water supply to Rumrill residence
CS-5	Curb stop	Shuts off water to sampling hydrant/blow-off station

SS-1	Sampling Station / Blow Off	Water sample collection location and blow-off for flushing of line.
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III. Startup Procedure

Flushing and Disinfection

Pipes, tanks, and equipment that can convey or store potable water are recommended to be disinfected in general accordance with American Water Works Association (AWWA) standard C651.05.

The steps that should be completed (and documented) are as follows:

1. Shut down primary supply well pump
2. Open all valves and blow-off station hydrant. Close curb stops to residences
3. Start well pump and flush line for 30 minutes.
4. Shut off well pump.
5. Add chlorine solution to the supply well to achieve a minimum 25 mg/l of free chlorine.
6. Start well pump to circulate chlorine solution into the distribution system.
7. Measure free chlorine at the blow-off hydrant at the end of the water main adjacent to the Glynn property. Once 25 mg/L is obtained at the blow-off hydrant, close the hydrant curb stop and turn off well pump. Chlorinated water discharged from the hydrant should be temporarily stored and neutralized prior to discharge to the ground
8. Maintain chlorinated water for a minimum of 4 hours (holding period). Periodically (every 2 hours) sample at blow-off hydrant to verify a free chlorine level of greater than 10 mg/L. If less than 10 mg/L, add additional chlorine to well and circulate as necessary. .
9. Periodically operate valves to allow contact with valve components.
10. After 4 hours, verify by testing that not less than 10 mg/L of free chlorine is present at the flush valve.
11. Start well and flush into storage tank(s) until residual free chlorine levels are below 0.5 mg/l.
12. Close blow-off hydrant and conduct biological testing (VTDEC Water Supply Rule, Appendix A, Table A11-7).
13. If testing meets VTDEC standards, resume normal operation. If not, investigate and re-disinfect as necessary.
14. Neutralize contained water as necessary for surface disposal, or properly dispose off-site.
15. Prepare decontamination summary report.

Source Sampling

When required due to significant maintenance or installation of a new well, conduct water quality testing of the source water for parameters contained in Appendix A Tables A11-5 and A-11-7 of the VTDEC Water Supply Rule. Refer to Appendix H of this O&M for source testing methods and water quality parameters.

Normal Sequenced Start-up

1. Verify curb stops are open.
2. Verify valves V-1, 2, 3 & 4 are open.
3. Verify Well #3 backup isolation valve is closed.
4. Verify discharge valve on primary supply pressure tank is closed and inlet valve open.
5. Turn on power to system components (i.e., the supply well pump).
6. Turn on well pump and allow pressure tank to fill; observe automatic shutdown of well pump.
7. Open pressure tank discharge valve. The well pump should restart shortly as the main fills with water.
8. Resume normal operation

Sequenced Start-up Procedure Following Maintenance

In order to start the operation of the water system, the following sequence of events must be completed:

1. Verify curb stops are closed and residences notified of start up.
2. Verify residences have at least one faucet open (preferably outside).
3. Verify valves V-1, 2, 3 & 4 are open.
4. Verify discharge valve on pressure tank is closed and inflow valve open.
5. Turn on power to system components (i.e., the supply well pump).
6. Turn on primary supply well pump and allow pressure tank to fill; observe automatic shutdown of well pump.
7. Open pressure tank discharge valve. The well pump should restart shortly as the main fills with water.
8. When pump shuts down following pressurization of the main, observe pressure gauge on tank for indication of pressure loss. If significant pressure loss observed, investigate main for leakage.
9. If significant pressure loss not observed, open individual curb stops and sampling station/blow off SS-1, verify flow to residences and sampling station, and allow to flush for 15 minutes minimum.
10. Observe water from each open faucet for evidence of odor or discoloration. If observed, continue to flush system until odor or discoloration is no longer present or until such time that the operator determines that additional investigation into source of odor/discoloration is required (one hour maximum).
11. Close faucets and SS-1 valve and resume normal operation.

IV. Normal Operations

The operations of the water system can be broken down into a number of categories that are defined by how often certain tasks must be completed. Many of the tests and tasks are necessary for compliance with drinking water regulations while others are requirements of the equipment or chemical manufacturer to ensure the reliability of the product and water system.

The Water System monitoring schedule has been developed by BFI. The schedule is typically reviewed every five years and updated as necessary. The schedule includes a timeline for compliance monitoring and is included with the Standard Operating Procedure (SOP) for Monitoring in Appendix H of this O&M.

Refer to the Inspection Checklist in Appendix E and the SOP for monitoring in Appendix H.

V. Safety

Personal Safety

Operation of a drinking water system poses some job-related hazards that must be adequately addressed to ensure not only an adequate supply of safe drinking water, but to provide for the health and safety of all persons associated with maintenance activities on the water system. These hazards include, but are not limited to slips, trips, falls, electrocution, asphyxiation, and chemical exposure. The table below lists many of the known hazards associated with the standard operation of the source of the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply system, as well as the precautions that must be taken to minimize the likelihood of a potential injury. Precautions include the use of appropriate personal protective equipment (PPE) including, but not limited to, gloves and face shields, and potentially

respirators. Material Safety and Data Sheets for chemicals used in the water system are contained in Appendix D of this document.

Hazard	Location	Necessary Precautions
Chlorine	Facility Manager's basement during disinfection	Maintain chlorine containers outside of building, proper PPE: gloves, eye-shield, appropriate ventilation
Electrocution	Electrical panel and connections	Follow lock-out tag-out procedures, disconnect main power before work

VI. Contingency Plan

Despite best efforts, unanticipated events may occur and result in shutdown of the water system. For this reason it is imperative that a Contingency Plan be available to minimize interruption of the water supply to end users.

Required Notification

Notification to end users is not required when source water is switched from the Primary to the back-up supply. However, if both the primary and back-up systems become non-functional, notification to end users is required and an alternate source of potable water will be made available to the end users. Notification will consist of a telephone call or personal visit to the residence.

Notice of system shutdown should be delivered to all users of the water system as soon as possible, but **no later than 24 hours** after switching to an alternate supply.

Back-up Water Supply Made Available

The water supply system contains 2 raw water sources (well #2-Primary and well #3-backup). In the event that the Primary source is unavailable, the backup source will be brought on line. To provide use of the backup source, the following steps should be completed in order:

1. Turn off Well #2 (primary source)
2. Close inflow valve from Well #2.
3. Open Well #3 inflow valve (allows Well #3 to feed water system)
4. Start Well #3

Refer to Figure 3 for valve locations.

Emergency Alternate Water Supply Made Available

If both water sources become inoperable or unusable, BFI will provide bottled water to the residents for potable uses until such time as the water supply is operational.

Sequenced System Shutdown

Shutdown of the main water system may be necessary due to water quality concerns, system leaks or other unsafe conditions. The following steps must be completed, in order, to safely shut-down of the main water system:

1. Turn off power for Primary and Backup sources (Well #2 and #3)
2. Close inlet valves to distribution system

3. Bleed pressure tank
4. Close curb stops

System Replacement

In the event replacement of the water supply system is required, the replacement system/system components will be designed/specified by an experienced water system engineer or technician. A Conceptual Water System Replacement Plan is included in Appendix G.

Trouble Shooting Operation Problems

During the course of operations, potential problems may occur. This section of the Operation & Maintenance Manual offers a guide to potential problems geared toward a quick solution to minimize interruption of water service to the customer.

Problem	Remedy
No water	Verify electrical power to well pump and that pump is operating; Verify all valves in correct positions.
Malfunctioning Well Pump	Switch service to alternate source (back-up well); Replace/repair malfunctioning well pump
Low Water Pressure in Distribution System	Verify pressure tank pressurized and not leaking. Investigate system for a leak. Investigate unusual water use by an end user.
Service Connection Break	Shut off curb stop; investigate and repair line as necessary.
Main Line Break	Use isolation valves and attempt to locate leak. Once located, repair as necessary.
Broken Valve Handle	Replace handle
Lightning Strike	Reset circuit breakers/attempt to restart well pump; If no start or damage to circuits, contact licensed electrician
Security Breach of Building	Contact law enforcement; Investigate for evidence of vandalism, theft or tampering
Security Breach of Source	Shut down system and contact law enforcement. Test water quality at source for evidence of tampering/contamination
Chemical Spill (e.g., during disinfection)	Utilize PPE, ventilate area and isolate spill if possible. Contact hazardous waste clean-up contractor as necessary.
Frozen Main Line	Locate, open nearest faucet and/or flush valve, thaw. Consider placing insulation over pipe prior to backfill.

Frozen Service Connection line	Locate, open nearest downstream faucet, thaw. Place insulation over pipe prior to backfill.
Lost/Can't find an isolation valve	Verify location on map. Contact surveyor if coordinates are available; if not, use metal detector or Dig Safe to locate.

Problem	Remedy
User complaints	See user complaint procedure in Section XIII of this manual
Electrical Controls failure	Shutdown system, shut off circuit breakers, notify users. Contact licensed electrician to troubleshoot and repair.
Discolored Water	Shutdown system and notify users. Attempt to locate source; isolate and flush as necessary. If unable to clear up water, further investigate including testing. Switch to back up supply.
Unpleasant taste associated with water	Shutdown system and notify users. Attempt to locate source; isolate and flush as necessary. If unable to remove taste, further investigate including testing.
Odor associated with water	Shutdown system and notify users. Attempt to locate source; isolate and flush as necessary. If unable to remove odor, further investigate including testing.

VII. Distribution

Main Line Description

The main distribution line of the water system is a 2-inch diameter polyethylene pipe. Figure 1 showing shut-off valves is contained in Appendix A, "Water System Map". Isolation valve location survey information is included on this figure and Figure 2. Shut-offs must be operated manually.

System Flushing

The flushing protocol is included in Appendix F – Standard Operating Procedures, of this document. Each time that system flushing is completed, the date should be recorded on an Inspection Checklist as presented in Appendix E.

VIII. Maintenance Program

Most maintenance of the water system is addressed in Section IV of this manual "Normal Operations". Contained within this section are more detailed information and direction regarding specific components of the system including specification sheets. The following list includes all equipment within the water system, the year installed or purchased, and a maintenance schedule for each component (the checklist is in Section IV).

Item	Year Installed	Maintenance Schedule
Well Pump	1994	As needed
Pressure tank	2012	As needed
Transmission Main	1994	As needed
Pressure Switches	1994	As needed
Isolation Valves	1994	As needed
Check Valves	1994	As needed
Curb Stops	1994	As needed
Sampling Station/Blowoff Valve	2013	As needed
Arsenic treatment	2013	Biannual
Iron treatment	2013	Biannual
Sediment filters	2013	As-needed

Specification Sheets

Specification sheets for water system equipment (if available) are contained in Appendix G of this manual. These sheets are updated as new equipment replaces old equipment.

IX. Vendor List

Vendor	Phone Number	Supply what?
		Technical and regulatory support and Guidance www.vermontdrinkingwater.org
Water Supply Division	800-823-6500	
Vermont Occupational Health & Safety (VOSHA)	802-828-2765	29CFR 1910 (OSHA Regulations)
Blue Granite Environmental Consultants, LLC	603-759-7806	System inspection and maintenance
Summit Environmental Consultants, Inc.	207-795-6009	Engineering and Sampling
Test America, Inc	716-691-2600	Testing Laboratory
Cushing Well Drilling		Well pump supplier

X. Official Water System Records and Maintenance Procedures

All water system files and records are the responsibility of the system owner and are to be managed and maintained by BFI and/or their designated consultant(s). Files and records are kept at:

BFI
c/o Republic Services
5600 Niagara Falls Boulevard
Niagara Falls, New York 14304-1532

Blue Granite Environmental Consultants, LLC
127 Tirrell Hill Road
Golfstown, New Hampshire 03045-2723

Summit Environmental Consultants, Inc.
640 Main Street
Lewiston, Maine 04240

The files maintained by the water system include:

- This Operation & Maintenance Manual
- Source Protection Plan
- Inspection and Maintenance Record
- Regulatory Compliance Test Results
- Emergency Response Plan
- User complaints
- Water Quality Data

XI. User Notification

The DSI Rockingham Landfill Missing Link Road Non-Public Water Supply system is not required to provide annual drinking water quality reports to users. However, BFI will notify users of the following as necessary:

1. Data indicating a significant change in water quality at the source wells.
2. What actions users should take,
3. What is being done to correct the situation; and
4. A contact name or number to check the status of the water supply system

XII. User Complaint Procedures

General Procedure

The general procedure for handling user complaints is as follows:

1. Review the complaint internally (BFI and its consultant(s))
2. Develop a response action
3. Meet with the resident to resolve the complaint

Relevant Phone Numbers

BFI	716-282-2676 ext. 212
Blue Granite Environmental Consultants, LLC	603-759-7806
Summit Environmental Consultants, Inc.	207-795-6009

Complaint Forms

(to be completed by water system representatives fielding the complaint)

Upon receipt of a user complaint, the person receiving the complaint must complete a User Complaint Form and submit to BFI. A copy of this form is included in Appendix E – Sample Documents/Forms.

XIII. Water Conservation Program

Water conservation strategies to ensure the long-term ability to provide adequate quantities of safe drinking water to all users have been instituted by the water system. The water system proactively monitors the total production of water and when any anomalies are noted, appropriate leak detection strategies are employed. The standard operating procedure associated with leak detection is contained in Appendix F.

During periods of low water, either through drought or other uncontrolled water shortage, the water system may periodically ask users to conserve water. These additional restrictions will be conveyed to all users in a manner consistent with Section XII – User Notification, of this O&M Manual. These restrictions may include, but are not limited to car washing and lawn watering bans. BFI and its consultants should make this decision together and then follow notification procedures as appropriate.

XIV. State of Vermont Water Supply Rule

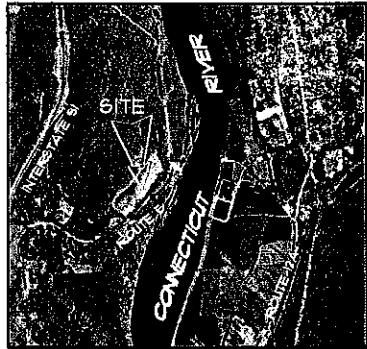
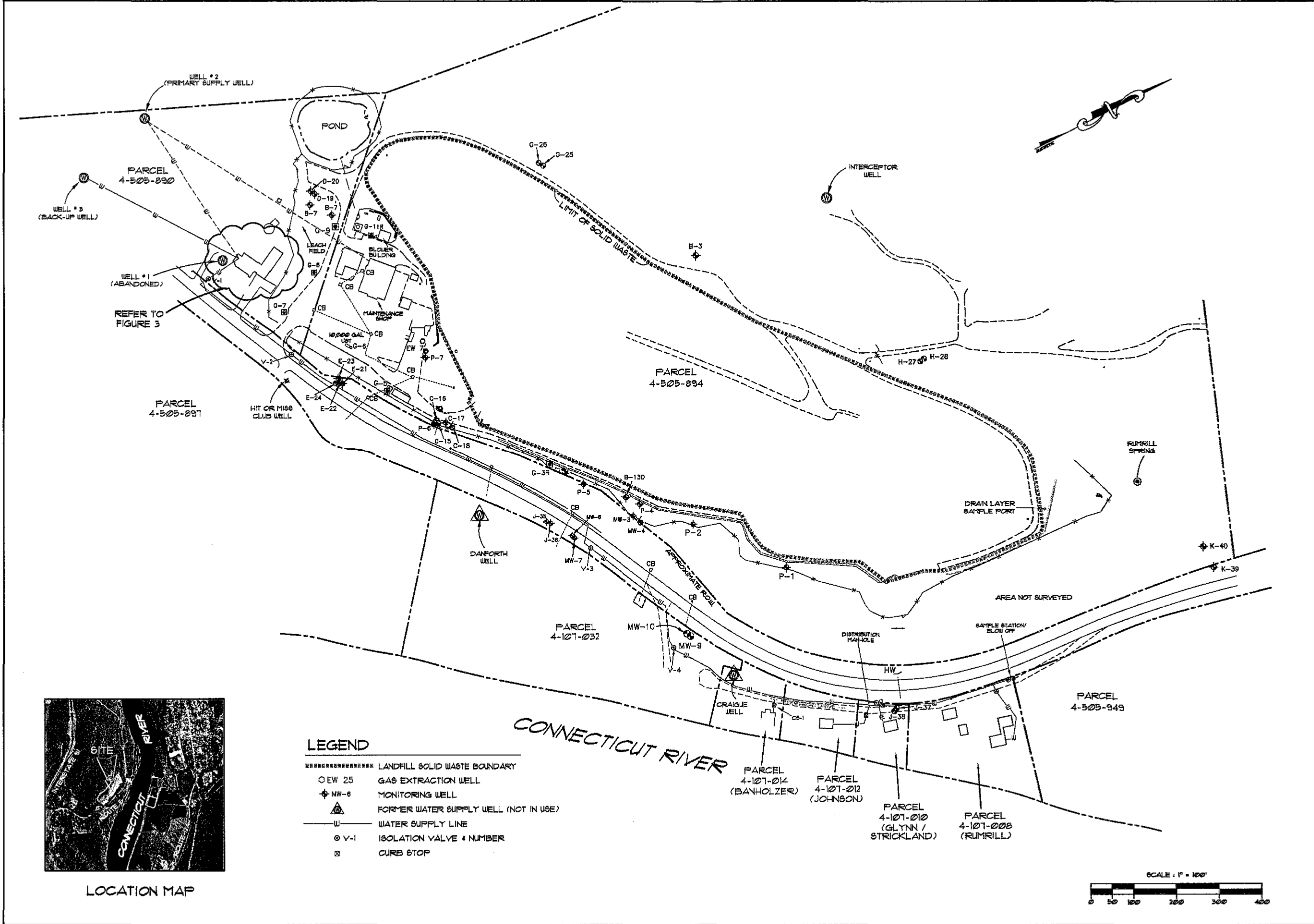
The Agency of Natural Resources, Department of Environmental Conservation, Environmental Protection Rules, Chapter 21 – The Water Supply Rule including all appendices is located at:

http://www.anr.state.vt.us/dec/watersup/wsrule/Vermont_WSR_December_2010.pdf.

This rule is updated as the state issues periodic revisions to the current standard, approximately once every two years.

Appendix A

Water System Maps



LOCATION MAP

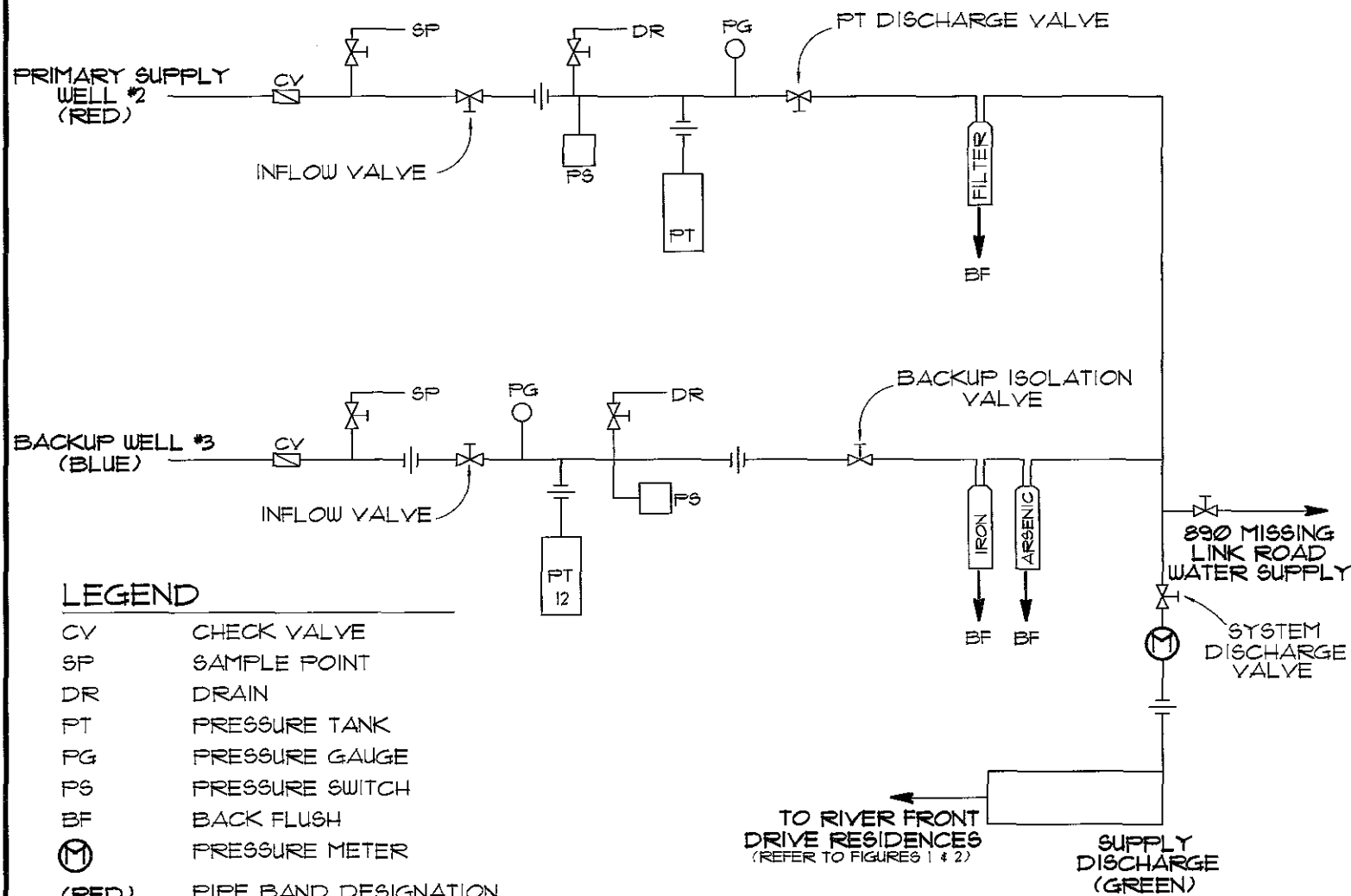
- LEGEND**
- LANDFILL SOLID WASTE BOUNDARY
 - EW 25 GAS EXTRACTION WELL
 - ⊕ MW-6 MONITORING WELL
 - △ FORMER WATER SUPPLY WELL (NOT IN USE)
 - W — WATER SUPPLY LINE
 - ⊙ V-1 ISOLATION VALVE & NUMBER
 - ⊞ CURB STOP



SHEET TITLE:		WATER SYSTEM MAP	
PROJECT:		DSI ROCKINGHAM LANDFILL MISSING LINK ROAD WATER SUPPLY SYSTEM	
CLIENT:		BROOKING-FERRIS INDUSTRIES 5400 NIAGARA FALLS BLVD. - NIAGARA FALLS, NY	
JOB NO. - 16813		DRAWN BY: KRF/MD CHECKED BY: MAD	
FIGURE 1		SCALE: AS NOTED DATE: JUNE 2013	
6-40 MAIN ST. LEWISTON, MAINE 04240		Tel: (207) 735-0000 Fax: (207) 735-6128 www.summitenv.com	
		NO. REVISION DATE	

Appendix B

Water System Schematic Drawing



LEGEND

CV	CHECK VALVE
SP	SAMPLE POINT
DR	DRAIN
PT	PRESSURE TANK
PG	PRESSURE GAUGE
PS	PRESSURE SWITCH
BF	BACK FLUSH
	PRESSURE METER
(RED)	PIPE BAND DESIGNATION
	VALVE

Tel: (207) 795-6009
Fax: (207) 795-6128
www.summitenv.com

640 MAIN ST.
LEWISTON, ME 04240

Summit
Environmental Consultants, Inc.

SCALE: NOT TO SCALE
CADD: 1689SCH.dwg

DRAIN BY: TND
CHECKED BY: MAD

DATE: FEBRUARY 6, 2013
JOB NUMBER: 1689

WATER SUPPLY
SYSTEM SCHEMATIC

MISSING LINK ROAD, ROCKINGHAM, VT

FIGURE 1

Appendix C

Source Protection Plan

SOURCE PROTECTION PLAN

DSI ROCKINGHAM LANDFILL MISSING LINK ROAD NON-PUBLIC WATER SUPPLY SYSTEM

The Primary and back-up supply wells (designated Well #2 and #3, respectively) for the DSI Rockingham Landfill Missing Link Road Water Supply System (the system) are located on property at 890 Missing Link Road (Refer to Figure 1). Drilling Logs are attached for reference. The wells are located approximately 500 feet south (cross gradient) from the Class IV Ground Water Reclassification boundary associated with the closed DSI Rockingham Landfill. With the exception of the closed landfill, the source well is located in a rural residential area. Approximately 28 residential wells are located within one mile of the landfill on the west side of the Connecticut River.

This Source Protection Plan (SPP) considers the extensive water quality database available for the Site and Institutional Controls implemented for the DSI Site.

There are three primary components to this plan:

1. Residential well groundwater monitoring program;
2. Post closure maintenance and deed restrictions associated with the closed landfill; and,
3. Monitoring of off property development with the potential to impact water quality of the aquifer.

Residential Well Monitoring

As part of EPA's Record of Decision (ROD) for the DSI Site, a residential water supply sampling program was developed and included as part of the Long-Term Monitoring Plan (LTMP) for the Site. Ten residential wells were selected as monitoring locations, based on hydrogeologic factors (e.g., source of groundwater and hydraulic location of the well) and geographic well location with respect to the landfill. The 10 wells include the source water supply wells (i.e., primary supply well #2 and backup supply well #3) for the residences currently supplied by the Missing Link Road (Non-Public) water system. The 10 wells in the LTMP are sampled on a rotating basis such that each well is tested at least every 5 years. However, water supply source wells for the Missing Link Road water supply system are sampled annually.

The wells are sampled for volatile and semi-volatile organic compounds and metals. Sampling results are reported annually to USEPA and VTDEC.

These analytical results provide ongoing water quality data to assess changes or trends in water quality at the water supply source and allow for mitigation measures to be implemented in the event that threats to the source water supply are identified.

Post Closure Maintenance and Deed Restrictions

Associated with closure of the landfill, remedial measures have been implemented to limit future impact to groundwater and to improve water quality in the source area protection zone. These measures include:

- Installation of an active landfill gas collection system to mitigate the migration of landfill gas.
- A multi-layer cap over the landfill.
- Surface water control systems and a well-vegetated landfill cover.
- Installation of a Ground Water Seepage Control System downgradient of the landfill.
- Natural attenuation of groundwater impacts.
- Implementation of operation, maintenance and monitoring activities.

Institutional controls in the form of deed restrictions on the properties owned by BFI were implemented by the *Grant of Environmental Restrictions and Right of Access*, dated June 4, 1996. Within seven DSI parcels (representing the portion of the facility where contaminants were previously detected above EPA established groundwater cleanup levels), the use of groundwater as a drinking water supply is prohibited. In addition, the use of groundwater as a drinking water supply is prohibited for non DSI owned parcels located within the Class IV groundwater reclassification area and associated buffer zone.

Off-Property Development

The Connecticut River to the east and very steep topography limits development in the vicinity of the supply well. As previously stated, with exception of the closed landfill, the area is a rural residential area and development of commercial or industrial facilities within the Source Protection Area is not likely.

Policies established in the Rockingham Town Plan discourage unsound development with the potential to impact groundwater. Policies state that "Development shall be compatible with the preservation of existing and future ground and surface water resources and their aquifer protection areas" and that "Development shall be reviewed as to its impact on water resources."

As a result of ongoing ground water quality monitoring, existing Institutional Controls and the limited development potential within the Source Protection Area, the risk of adverse impacts to Source Water quality is low. Conditions within the source protection area will be reviewed periodically and should the risk to the source increase, BFI will institute mitigation measures to reduce potential risks.

WATER WELL DRILLERS
Job Report

15015-2

170 Box 2
Springfield
Customer UT 05/56
B.F. N.

#2 well

Pump By: C.S.

Date Signed 7/10/87 by Henry

Date Completed 5/14/87 by Ben

Phone: _____ work _____

Rackham, H.

Well Data

Total Depth 400 ft. yield 7 gpm
Casing Length 110 ft. static _____ ft.
Depth to Bedrock 96 ft. off-set _____ ft.
Other Materials: _____

Pump Data

Type installation: _____
Sub Cont.: _____ Ph.# _____
Foundation _____ Stone _____ Cement _____ Slab _____
R. Hammer _____ yes _____ no _____
Panel to C. Box: _____ ft. _____
Elec. Type: _____
Type Plumbing: _____ PVC _____ Copper _____ Iron _____

BT 5.8

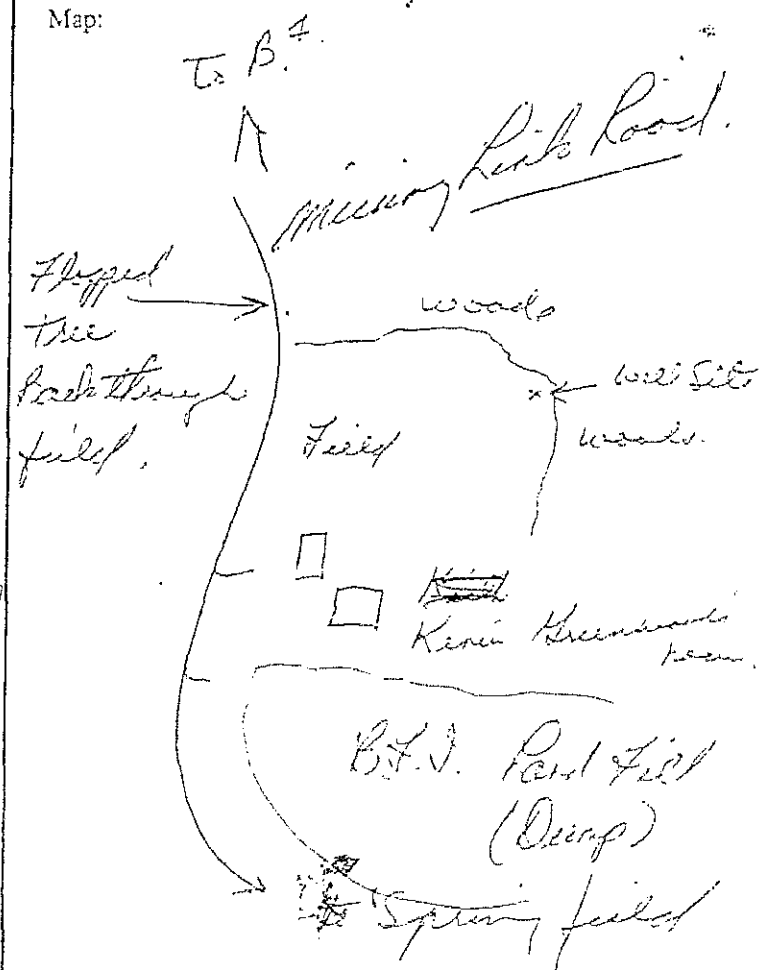
Well Location: _____

Map:

Field is a fresh plowed & barren field because it is dry.

Overbarden 0-10 silt
10-96 Clay
96 - Shale
96 - 400 Blk. shale
[Limestone formation]

Water obtained in a quantity
intrusion at 340 ft level



Note: Sketch pressure tank location, electrical service panel location, and other helpful information.

Well #3

(For Driller's Use)

This report must be completed and submitted to the Department of Water Resources and Environmental Engineering.

no later than 60 days after completion of the well.

DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING WELL COMPLETION REPORT

W.R. _____ U.S.G.S. _____
Field Location ☐ Map area _____
Latitude _____ " Elev. _____
Longitude _____ " Topo. _____
Scale: 62,500 ☐ 25,000 ☐ 24,000 ☐
Data in Town Files ☐

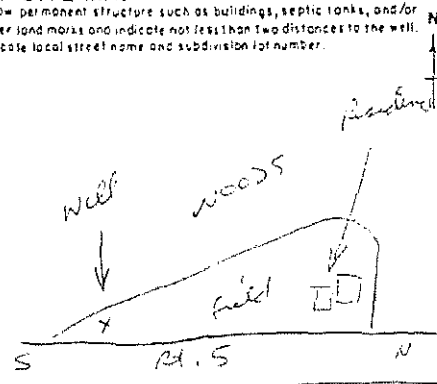
Location map attached to WCR _____

1. WELL OWNER BFI of Vermont, Inc. 894 Missing Link Rd., Rockingham, VT 05010
OR
WELL PURCHASER _____
Name _____ Permanent Mailing Address _____
2. LOCATION OF WELL: TOWN ROCKINGHAM SUBDIVISION _____ LOT NO. _____
3. DATE WELL WAS COMPLETED _____
4. PROPOSED USE OF WELL: ☒ Domestic, ☐ Other _____
5. REASON FOR DRILLING WELL: ☐ New Supply, ☐ Replace Existing Supply, ☐ Deepen Existing Well, ☐ Test or Exploration,
☒ Provide Additional Supply, ☐ Other _____
6. DRILLING EQUIPMENT: ☐ Cable Tool, ☒ Rotary with A-P, ☐ Other _____
7. TYPE OF WELL: ☒ Open Hole in Bedrock, ☐ Open End Casing, ☐ Screened or Slotted, ☐ Other _____
8. TOTAL DEPTH OF WELL: 700 feet below land surface.
9. CASING FINISH: ☐ Above ground, Finished, ☒ Above ground, Unfinished, ☐ Buried, ☐ In Pit, ☐ Removed, ☐ None used, ☐ Other _____
10. CASING DETAILS: Total length 160 ft. Length below L.S. 158 ft. Dia. 6 in. Material Steel WT 19 lb/ft
11. LINER OR INNER CASING DETAILS: Length used _____ ft. Diameter _____ in. Material _____ Weight _____ lb/ft
12. METHOD OF SEALING CASING TO BEDROCK: ☒ Drive Shoe, ☒ Grout - type BENTONITE, Drilled _____ in hole _____ ft. in Bedrock
☐ Other _____
13. SCREEN DETAILS: Make and Type _____, Material _____, Length _____ ft., Diameter _____ in.,
Slot Size _____, Depth to top of screen in feet below land surface _____ ft., Gravel pack if used: Gravel Size or Type _____
14. YIELD TEST: ☐ Boiled, ☐ Pumped, ☒ Compressed Air, for 3 Hours at 2 Gallons per minute
Measured by ☒ Bucket, ☐ Orifice pipe, ☐ Weir, ☐ Meter ☐ Permanent Airline installed
15. STATIC WATER LEVEL: 40 feet below land surface, Date or Time measured 9/27/91, Overflows at _____ G.P.M.
16. WATER ANALYSIS: Has the water been analyzed? ☒ Yes ☐ No, if Yes, Where Cheshire Water Lab (copy attached)
17. SPECIAL NOTES: _____
18. WELL LOG

Depth from Land Surface		Water Bearing	Formation Description	Sketch
Feet	Feet			
Ground Surface	<u>5</u>		<u>SAND</u>	
<u>5</u>	<u>146</u>		<u>SANDY S.I.T. CLAY</u>	
<u>146</u>	<u>700</u>		<u>GRAY GRANITE</u>	

19. SITE MAP

Show permanent structure such as buildings, septic tanks, and/or other land marks and indicate not less than two distances to the well. Indicate local street name and subdivision lot number.



20. TESTED YIELD

If the yield was tested at different depths during drilling, list below

Feet	Gallons Per Minute

WELL DRILLED BY: ROBERT BARRETT, JR.DOING BUSINESS AS: LARRY G. CUSHING & SONS, INC.
Company or Business NameREPORT FILED BY: Paul Cushing
Authorized SignatureDATE OF REPORT: 10/24/91WELL DRILLERS LIC. NO. 112

VT Well Tag No. 1218

CUSHING & SONS, INC.
WATER WELL DRILLERS
Job Report

Customer

BFI of Vermont

RTS

Rockingham VT

Pump By:

Crs

Date Signed

9/20/84

by

Bart

Date Completed

9/24/84

by

Bob B

Phone:

work

Well Data

Total Depth 700 ft. yield 2 gpm

Casing Length 160 ft. static

Depth to Bedrock 146 ft. off-set

Other Materials:

5.91" But

Pump Data

Type installation:

Sub Cont.: Ph.#

Foundation Stone Cement Slab

R. Hammer yes no

Panel to C. Box: ft.

Elec. Type:

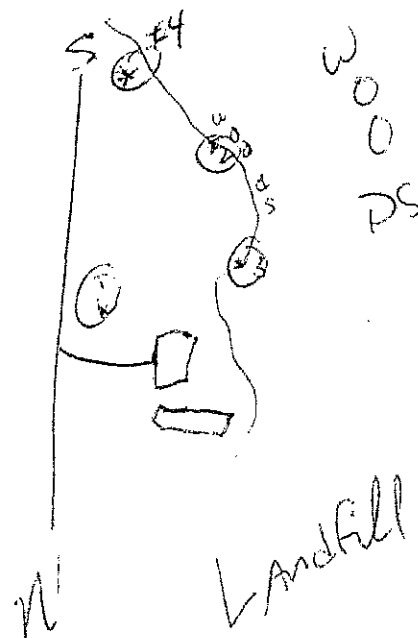
Type Plumbing: PVC Copper Iron

Well Location:

Map:

10' 5' 146 Set, Tell
- 146 - Gray Granite
Set sat - 360, 450, 495
3 1/2" - 495
495 - 700

Water @ 360
485-495
560



Note: Sketch pressure tank location, electrical service panel location, and other helpful information.

Appendix D

Material Safety and Data Sheets (MSDS)

Appendix E

Sample Documents and Forms

PERIODIC INSPECTION CHECKLIST – CONTINUED
DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

EVERY 6 MONTHS OR AS NEEDED			
Task	Date last completed		
<i>Replace Primary Supply Well Particulate Filter</i>			
<i>Replace Particulate Filters in Each Residence</i>			

ANNUALLY			
Task	Date last completed		
<i>Perform supply well and residential monitoring</i>			
<i>Review laboratory analysis results and prepare/submit required reports to USEPA and VTDEC</i>			
<i>Flush distribution system</i>			
<i>Exercise all valves in distribution system</i>			
<i>Test check valves for proper operation</i>			

GREATER THAN ANNUAL FREQUENCY			
Task	Frequency	Date last completed	
<i>Replace backup system iron and arsenic filters</i>	Every 2 years		
<i>Pressure test system</i>	Every 3 years		

COMMENTS:

Appendix F

Standard Operating Procedures

Standard Operating Procedure: Distribution System Flushing

Unidirectional distribution system flushing of the – following the distribution flow of water to the ends of the DSI Rockingham Landfill Missing Link Road Water Supply System will be conducted periodically (e.g., annually) and include exercising of system valves. The following method should be adhered to in flushing of the water system so that the entire system is adequately flushed and that "pockets" of water do not remain stagnant in the system. Flush is intended to mitigate build up on the interior of the piping and remove sediments that are present in the piping.

Typical flushing protocol is as follows:

1. Coordinate flushing with a residential sampling event to verify post-flush water quality
2. Notify consumers of the intent to flush the system and obtain permission to enter their properties to conduct the procedure
3. Turn off well pump
4. Verify all isolation valves and sample station/blow off valve are open. Verify curb stops are closed
5. Open sample station/blow off valve and allow main line to gravity drain
6. Once no flow is observed at the sample station/blow off , verify system valves are in the correct position and start well pump
7. Allow system to flush for a minimum of one (1) hour
8. During flushing, exercise isolation valves
9. Observe adequate flow at each residence by opening the respective curb stop and a hose bib, observing discharge from the bib
10. Close residential hose bibs and curb stops
11. Close sample station/blow off valve and observe well pump shutdown via pressure switch
12. Document flushing on Inspection Form.

Standard Operating Procedure: System Inspection and Maintenance
DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

Inspection

Periodic inspection of the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System will be in accordance with the Inspection Checklist included in Appendix E of the Operations and Maintenance (O&M) Manual. Inspections will be performed by the system operator or designated consultant. The relevant portions of the inspection form will be completed for each inspection, with a copy provided to Republic Services for review and filing.

Maintenance

Maintenance will be performed as necessary based on observations during the periodic inspections or should an unplanned system shutdown occur or be required. Maintenance activities will be coordinated with Republic Services, including obtaining purchase orders necessary for the work.

Considering the simplicity of the system and small number of consumers being served, periodic maintenance/replacement of components will typically not be performed unless so determined by inspection or component failure.

Standard Operating Procedure: Supply Well and Residential Monitoring
DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

Refer to Appendix H

Standard Operating Procedure: Supply Main Leak Testing

DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

The water supply main of the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System will be leak tested a minimum of every three (3) years.

Typical leak testing protocol is as follows:

1. Notify consumers of the intent to leak test the main and that water service will be unavailable for up to three (3) hours
2. Turn off primary supply well pump
3. Verify all isolation valves are open
4. Verify curb stops are closed
5. Turn on primary well pump and pressurize main line until well pump pressure switch turns off pump.
6. Immediately close "system discharge" valve (refer to Figure 3)
7. Allow gauge pressure to stabilize
8. Once stabilize, record time and gauge reading
9. Observe gauge for one (1) hour, then record pressure reading
10. If pressure constant or if only minimal change is observed, consider test complete
11. Open curb stops and discharge valve, allowing pressure to bleed off.
12. Restart well pump
13. Document test on the Inspection Form, and note start and stop time and pressure in comment section of form.

If significant pressure drop observed, investigate main line and isolation valves for leak.

Standard Operating Procedure: Supply Well Quantity Test

DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

Supply well yield (quantity) for the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System will be reviewed a minimum of every five (5) years or in the event of a failing supply main pressure test where no leaks are discovered. Yield will be estimated by a certified well driller and reviewed by BFI for adequacy relative to the Missing Link Road System requirements.

Appendix G

Technical Specifications and Conceptual Water System Replacement Plan

CONCEPTUAL WATER SYSTEM REPLACEMENT PLAN

DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

This Conceptual Water System Replacement Plan provides guidance to be followed if the existing water supply line (i.e., the main) for the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System needs to be replaced in the future. Materials and installation presented in this plan are intended to be in substantial compliance with the most current version of the VTDEC Water Supply Rules for a Non-Public Water System requiring a Permit, even though a permit is not required for the DSI Rockingham Landfill Missing Link Road Non-Public Water Supply System

This Plan is presented by system component and/or location.

Pressure Tank and Transition Piping

Existing pipes, ball valves, check valves, sampling ports, pre-treatment system and pressure tank (including installation "T-package") will be replaced as necessary. Pipe routing and valve location will consistent with the existing layout

Piping will be PVC with threaded fittings.

A Vermont licensed electrician will review existing circuitry and wiring for conformance with current codes. Circuitry will be upgraded as necessary.

Main Distribution Line

Approximately 2,400 lineal feet of new distribution main will be installed between the 890 Missing Link road property and curb stop at the Rumrill residence. [Note that Main line to Rumrill was installed in April 2013] Replacement pipe will be routed under Route 5 near the former Facility Manager's house driveway and continue down the east side of Route 5 to the southern property line of the Banholzer property. From this point, the line will following the existing Main line route to the residences along River Front Drive.. Relocation intended to avoid contact with electrical conduct along west side of Route 5 and provide for adequate separation from the landfill interceptor trench. Relocated pipe will maintain a minimum 18 inches of separation when crossing storm drain pipes.

The main between the 890 Missing Link Road home and Route 5 will be installed using conventional trench excavation and backfill. Pipe extending beneath Route 5 and along the east side of the Route 5 will be installed using directional drilling or conventional trenching depending on site conditions and cost effectiveness. Service connections will be installed via a trench.

Proposed materials and locations of use include the following:

- Replacement pipe: 2 inch diameter flexible polyethylene pipe with mechanical joint connectors
- Isolation valves:
 - V-1 located on the west side of Route 5 at the 890 Missinli Link property driveway
 - V-2 located approximately 650 feet down line from V-1
 - V-3 located at the entrance to River Front Drive (approximately 650 feet from V-2)
- Sampling Station/Blow-off Valve:
 - SS-1 located at end of main 2" pipe run (re-use existing).

Service Connections and Curb Stops

Replacement service connections between the main line and existing curb stops will be installed using 1 inch diameter polyethylene pipe for Banholzer, Johnson, Rumrill and Glynn residences. If necessary, curb stops will be replaced with new.

The service connection to the closed Facility Office/Maintenance Garage will be replaced with a 1 inch polyethylene pipe.

Continuing Service

The existing waterline will be maintained and operated until pressure testing, disinfection and water quality monitoring of the new main is complete. At that time, the services will be tied in at the curb stops and water supply provided by the primary supply well (#2) and residential water quality monitoring performed.

Pressure Testing

Pressure testing will be performed on the newly installed main in accordance with the Standard Operating Procedure (SOP) in Appendix F of the Operations and Maintenance Manual (O&M).

Flushing and Disinfection

Flushing and disinfection of the main will be in accordance with Section III of the O&M.

Residential Well Monitoring

Residential well monitoring will be performed in accordance with the Sampling Plan in Appendix H of the O&M.

Schedule

Estimated construction schedule is two (2) work weeks, plus an additional 2 days to flush and disinfect the main line.

Appendix H

Sampling Plans

Sampling Plan

DSI Rockingham Landfill Missing Link Road (Non-Public) Water Supply System

This Sampling Plan has been developed to monitor water quality at the DSI Rockingham Landfill Missing Link Road Water Supply System. Based on review of the Vermont Agency of Natural Resources Department of Environmental Conservation Chapter 21 Water Supply Rule, The Missing Link Road Water Supply System is a Non-Public water supply system that does not require a permit. However, as part of Institutional Controls at the DSI Landfill site, the US Environmental Protection Agency (USEPA) has requested that the water supply system substantially meet standards for use as a multi-user water supply system. Therefore, this Sampling Plan has been prepared to address sampling and analysis of the system water supply wells and residences.

The Missing Link Road Water Supply System primary and back-up supply wells (Well #2 and #3)) are tested annually by Test America, Inc. for volatile organic compounds, arsenic, manganese, iron and general chemistry parameters as part of a long-term monitoring program instituted by BFI for the DSI Site.

Equipment and information required prior to sample collection:

- Sample bottles and laboratory sampling form (chain-of-custody);
- Cooler and ice;
- Delivery method based on holding times from the Analytical laboratory

A new pair of nitrile gloves will be donned at the start of the sampling process for each sampling location. Gloves provide for sample integrity and adequate protection of the sampler from sample preservatives. Prior to sampling, each sample bottle will be labeled with the sampling location, sampling time, required analysis, sampler's initials, and preservatives used.

Samples will be collected directly from a sample port (tap) located on the incoming line from the well. The tap is located upstream of the pressure tank and discharge line.

Residential samples will be collected annually for manganese and arsenic from an external spigot.

The sample collection procedure is as follows:

1. Establish a drain system (i.e., floor drain, exterior discharge) to allow for flushing of the line.
2. Prior to turning on the water, remove any aerator, strainer or hose that is present and wipe the spigot with a dilute sodium hypochlorite (bleach solution) or similar disinfectant.
3. Start the well (or open the residential spigot) and flush for a minimum of 15 minutes prior to collection of the sample. Document the sampling point location and flushing procedure on field sampling forms. Note that initial purging (flushing) at the blow-off hydrant for 15 minutes will remove stagnant water from the main line and allow subsequent residential outdoor spigots to be purged for less time to remove stagnant water from the residential plumbing system. Five minutes of purging is adequate prior to sampling at residential spigots.

4. Once the system is flushed, reduce the water flow so the stream of water is no greater than ¼ inch in diameter, or the width of a pencil. Verify that flow is constant and that the water is not aerated.
5. An aliquot of water shall be collected in a decontaminated transfer vessel (or low flow cell) and portable field instrumentation shall be used to measure pH, turbidity, temperature, and specific conductivity.

Following collection of field parameters, sample bottles will be filled for analysis of arsenic and manganese.

6. Each sample bottle will be labeled with the sampling location, sampling time, required analysis, sampler's initials, and preservatives used.
7. Immediately following sample collection, bottles will be placed on ice in a cooler and cooled to approximately 4 degrees Celsius (39 degrees Fahrenheit).
8. The sampler will complete the laboratory sampling form, also known as the chain-of-custody. Determine the appropriate method of delivery to the laboratory to ensure that samples will be received at the lab within holding times.
9. Samples will be delivered to the designated laboratory preserved as required and within designated holding times.

Appendix J

Emergency Response Plan

Emergency Response Plan

DSI Rockingham Landfill Missing Link Road (Non-Public) Water Supply System

Despite best efforts as an operator, there will be times the supply of water will not be available for use by the consumer. DSI Rockingham Landfill Missing Link Road (Non-Public) Water Supply System has developed this Emergency Response (Contingency) Plan. Should the need to implement this Emergency Response Plan arise, BFI will notify all users with the nature of the emergency – planned response and duration of the event. Public notice will be delivered to all water system users as soon as possible (prior to any potential consumption of the emergency source water), but **no later than 24 hours** after switching to the emergency source. Public notice will typically be given by verbal notice. Contact phone numbers include:

890 Missing Link Rd	802-463-3707
Banholzer	802-921-4298
Johnson	802-463-2274
Glynn	239-248-4940
Rumrill	hand deliver

Some anticipated emergencies and associated response action include:

Well Pump Failure	Check electrical connections; replace well pump if necessary. Initiate alternate water supply in the interim. A spare well pump will be maintained on Site.
Main Line Leak	Perform sequence system shutdown (see below) and investigate. Provide bottled water or other potable water source to consumers as necessary.
Pressure Tank Failure	Perform sequence system shutdown and replace pressure tank. Initiate alternate water supply as necessary.
Water Quality Issue	Perform sequence system shutdown and investigate; Initiate alternate water supply as necessary.

An alternate water supply has been identified for use in emergency situations. The alternate supply for the DSI Rockingham Landfill Missing Link Road Water Supply System is Well #3, which is directly connected into the main system. To start using this source, the following steps should be completed in order (refer to the Water System Schematic Drawing (Figure 3) in the Operations and Maintenance Manual.

1. Turn off Well #2
2. Close the Well #2 "inflow" valve
3. Open Well #3 "inflow" valve
4. Start Well #3

Sequence system shutdown of the main water system consists of the following steps:

1. Turn off Well #2
2. Close "inflow" and "discharge" valves
3. Bleed pressure tank