Evaluation of Corrective Action Alternatives
Long Falls Paperboard
161 Wellington Road
Brattleboro, Vermont 05301

EPA RFA 19093
Vermont DEC Site #2018-4828

September 22, 2020
Revised November 18, 2020

Prepared For:
Brattleboro Development Credit Corporation
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EXECUTIVE SUMMARY

This document is an Evaluation of Corrective Action Alternatives (ECAA) for Long Falls Paperboard, 161 Wellington Road, Brattleboro, Vermont (Site, Vermont Department of Environmental Conservation (DEC) Site #2018-4828). The cleanup will be focused on remediating the out of service wastewater holding basin and its contents (sludge and a silt-clay liner). The purpose of this ECAA is to present alternative potential remedies for cleanup of wastewater holding basin sludge and to make a recommendation for cleanup.

The property consists of a 39.52-acre parcel with an active paperboard manufacturing facility at the north end of Wellington Road in Brattleboro, Vermont (see Appendix A). A Phase II Environmental Site Assessment (ESA) was completed in 2019 and a Corrective Action Investigation was performed in 2020. The Corrective Action Investigation included holding basin sludge and soil sampling and testing, and groundwater sampling and testing. A review of relevant background information on vanadium in soil concentrations was conducted, including soils data from various Vermont locations, as well as national data. These data are presented in Section 1.0. The following conclusions were made.

1. Soil testing indicates no contamination above residential screening levels in the sandy soils surrounding the holding basin lagoon. This suggests that overtopping in the past was not a frequent or significant occurrence.
2. Holding basin sludge testing indicates the presence of dioxin and poly and perfluoroalkyl substances (PFAs), which will influence disposal options.
3. Groundwater PFAs concentrations are uniformly below state standards.
4. Results of the background vanadium soil review indicate that vanadium concentrations in Site soils are not abnormally elevated with respect to other locations, and are toward the low end of reported concentration ranges at other Vermont locations.[1]

Three remedial options were ranked to arrive at a remedial recommendation, using the ten evaluation criteria presented in Section 35.604 (D) (1-10) of the DEC's 2019 Investigation and Remediation of Contaminated Properties Rule. Based on the evaluation of cleanup alternatives, Alternative 3: Off-Site Sludge and Soil Disposal and Re-grading, is recommended. This alternative is technically and economically feasible, and results in no need for an environmental easement for residual sludge. LEE recommends that a Corrective Action Plan be developed incorporating Alternative 3 as its remediation strategy.

While the results of soil testing on the holding basin berm show that the soils to be used for the clean soil cap meet applicable residential soil standards, soil testing along the railway and railway spur demonstrated polycyclic aromatic hydrocarbon

[1] See Corrective Action Investigation Report, Long Falls Paperboard, Section 13, August 14, 2020.

(PAH) concentrations above residential soil standard; therefore, the Site's Brownfields Certificate of Completion (COC) will need to have a restriction on residential Site use in the area of the railway and railway spur. There is no need for further environmental assessment of these soils assuming the restriction on residential use is included in the COC.

LEE understands that a separate parallel evaluation of the #6 fuel oil contamination plume is taking place concurrent with this ECAA. The purpose is to provide a current delineation of the extent of #6 fuel oil contamination beneath the Site, in support of an environmental easement to be contained in the Site's COC.

1.0 INTRODUCTION AND SITE BACKGROUND

This document is an Evaluation of Corrective Action Alternatives (ECAA) for Long Falls Paperboard in Brattleboro, Vermont (Site, Vermont DEC Site #2018-4828). The purpose of this ECAA is to present and evaluate three alternative potential remedies for cleanup of a wastewater holding basin at the Site. LE Environmental LLC (LEE) prepared this ECAA for Brattleboro Development Credit Corporation, the current Site owner. A Site Location Map is included in Appendix A.

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement 00A00502 to the Brattleboro Development Credit Corporation (BDCC). The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

The property consists of a 39.52-acre parcel with an active paperboard manufacturing facility at the north end of Wellington Road in Brattleboro, Vermont (see Appendix A). The Vermont Department of Environmental Conservation (DEC) indicates that the Site is in a designated "urban background" zone for soil contamination. Therefore, soil data collected during previous investigations was evaluated as a non-residential property in a designated urban background zone.

A Phase II Environmental Site Assessment (ESA) was completed in 2019[2] and a Corrective Action Investigation was performed in 2020.[3] The Phase II ESA addressed Recognized Environmental Conditions (RECs) identified in a Phase I ESA performed for BDCC prior to acquisition of the property.[4] The Corrective Action Investigation followed up on issues identified in the Phase II ESA that potentially met the DEC criteria for Corrective Action. The Corrective Action Investigation included holding basin sludge and soil sampling and testing, and groundwater sampling and testing. A review of relevant background information on vanadium in soil concentrations was conducted.

Subsequent to the Corrective Action Investigation, LEE re-tabulated the holding basin berm soil analytical results to include comparison to residential soil standard. The results (included in Appendix C), demonstrate that the shallow soils in the holding basin berm meet current state and federal residential soil standards.

[2] Stone Environmental, October 14, 2019.
[3] LE Environmental, August 14, 2020.
[4] LE Environmental, December 12, 2018.

The following conclusions were made.

1. Soil testing indicates no contamination above residential screening levels in the sandy soils surrounding the holding basin lagoon. Soils were tested for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl products (PCBs), RCRA 8 metals, and dioxin and furan congeners. This suggests that overtopping in the past was not a frequent or significant occurrence and that the soils were not contaminated when they were brought to the Site.
2. Holding basin sludge testing indicates the presence of dioxin and poly and perfluoroalkyl substances (PFAs), which will influence disposal options. PCBs were also detected in the sludge. One of five sludge samples had PCBs greater than 1 part per million, which is the TSCA threshold of concern for remediation waste. This PCB concentration will not affect the sludge disposal options, but additional testing will need to be performed following the sludge removal to show that the PCBs were removed to a sufficient level to comply with TSCA requirements.
3. Groundwater PFAs concentrations are uniformly below state standards.
4. Results of the background vanadium soil review indicate that the range of vanadium concentrations in Site soils are not abnormally elevated with respect to other locations, and are toward the low end of reported concentration ranges at other Vermont locations. LEE's research found no evidence to suggest that paper manufacturing is a specific anthropogenic contributor of environmental vanadium, and the vanadium concentrations reported during the Phase II ESA are likely to be naturally occurring. The following table summarizes the background vanadium soils data compiled during this survey (range of reported vanadium concentrations in mg/kg, ppm).

LFP Brattleboro	Richmond Creamery	St. Albans AFB	USGS 2013 Vermont	Vermont Yankee Vernon	ASTDR Global	USGS 2017 USA	NJDEP 1993 Statewide
6.6-17.9	7.7-30	8-60	14-137	5.6-21.8	100	10-500	<2-96 (rural) 40-800 (urban)

LEE made the following recommendations in the Corrective Action Investigation Report:

1. An ECAA and a Corrective Action Plan (CAP) should be developed to address remediation at the holding basin.
2. No further action is warranted with respect to on-Site soils or groundwater PFAs concentrations. The groundwater monitoring wells installed during the Phase II ESA should be properly abandoned.
3. No further action is warranted with respect to vanadium soil concentrations.

4. Active remedial measures do not appear to be warranted for other Recognized Environmental Conditions presented the Phase I ESA report (historic #6 fuel oil release, historic gasoline/diesel USTs, sumps, floor drains, equipment yard, drums, filled areas, adjacent Sites, septic systems or the rail line).
5. LEE understands that a separate parallel evaluation of the #6 fuel oil contamination plume is taking place concurrent with this ECAA. The purpose is to provide a current delineation of the extent of #6 fuel oil contamination beneath the Site, in support of an environmental easement to be contained in the Site's Certificate of Completion under BRELLA.[5] Groundwater monitoring wells at the Site are potentially still in use for the #6 fuel oil evaluation. Therefore, well abandonment as recommended in LEE's Corrective Action Investigation Report is not part of this ECAA.

The DEC accepted the Corrective Action Investigation Report on September 8, 2020.[6]

The following table presents stakeholder information for the cleanup.

Stakeholder	Mailing Address	Name and Email Address	Phone Number
Brattleboro Development Credit Corporation	76 Cotton Mill Hill Brattleboro, Vermont 05301	Bobbi Kilburn bkilburn@brattleborodevelopment.com	(802) 257-7731
Long Falls Paperboard	161 Wellington Road Brattleboro, Vermont 05301	Gabriela Constantin gabriela.constantin@longfallspaperboard.com	(802) 257-0365
Town of Brattleboro	230 Main Street, Suite 202 Brattleboro, VT 05301	Sue Fillion sfillion@brattleboro.org	(802) 251-8112

Tabulated results of testing performed during the Corrective Action Investigation are provided in LEE's Corrective Action Investigation Report dated August 14, 2020. No additional pilot testing, development of site-specific background standards, or waiver requests have been developed in connection with this ECAA.

[5] LEE, personal communication with Shawn Donovan of the DEC on September 17, 2020.
[6] Electronic Mail Message Shawn Donovan to Alan Liptak of LEE, September 8, 2020.

2.0 IDENTIFICATION OF CORRECTIVE ACTION ALTERNATIVES

Following are the identified Corrective Action Alternatives required by Section 35-604(c) of the 2019 I-Rule. Corrective action alternatives that eliminate exposure pathways to sensitive receptors are required. The Site does not qualify for exemption from the DEC's 2019 I-Rule corrective action requirements under Section 35-602 (a) or (b), or for exemption from the ECAA requirement under Section 35-604 (b).[6]

A minimum of two corrective action alternatives must be considered according to the I-Rule. These include:

1) An alternative that reduces the toxicity, mobility, or volume of the hazardous materials released to the extent feasible. This alternative shall minimize the need for long term management at the Site; and,
2) An alternative that involves little or no treatment but controls impacts to sensitive receptors through engineered controls, containment, long term monitoring, and institutional controls.

Corrective action alternatives that satisfy these criteria have been addressed. The alternatives considered include the following:

1) ECAA Alternative 1: Fencing Installation, no other action.
2) ECAA Alternative 2: On-Site Sludge and Soil Capping and Re-grading.
3) ECAA Alternative 3: Off-Site Sludge and Soil Disposal and Re-grading.

Plans showing conceptual layouts included in Appendix A. Budgetary cost estimates are included in Appendix B.

3.0 DESCRIPTION OF CORRECTIVE ACTION ALTERNATIVES

LEE identified three possible remedial options to address cleanup of the holding basin sludge. LEE developed a remedial screening matrix using the criteria set for the in I-Rule Section 604(D)(1-10). The screening matrix and the scoring results are in Section 4.0 of this ECAA. Archaeological monitoring is not included for any of these alternative remediation efforts, based on conversations with EPA Region 1, because all of them would take place in previously disturbed ground.

[6] LEE, personal communication with Shawn Donovan of the DEC on September 17, 2020.

3.1 ALTERNATIVE 1: NO ACTION/INSTALL FENCING

The wastewater holding basin would be fenced off to inhibit access and exposure to the wastewater holding basin sludge. Approximately 500 feet of 6' high chain link fence would be installed around the top of the berm as shown on the Alternative 1 drawing in Appendix A. No other cleanup work would be performed. The sludge would remain exposed to the environment inside the closed basin. Runoff would not be an issue because the basin is a closed structure, but wind borne particle transport could take place. The wastewater holding basin area would not be usable for any other purpose. Because the sludge would remain on Site, an environmental easement noting the presence of the sludge would be required to be included in the Certificate of Completion. The work would also include EP oversight, contract management, construction documentation and Brownfields Completion Reporting.

The budgetary cost estimate for Alternative 1 is $16,308. This figure includes contractor mobilization, and the cost of the fence installation. An allowance for oversight of the cleanup process and completion reporting is also included.

The no action / fence alterative is deemed moderately protective of the environment due to the contained structure (no runoff), and moderately protective of human health due to access restriction. However, the sludge would remain exposed to the elements, and wind blown particles could be generated, which could result in environmental or human health effects. It is not clear that this alternative is compliant with legal requirements to cleanup the Site under BRELLA, because there would be no reduction in the toxicity or volume of the waste, and the holding basin portion of the Site would not be redeveloped. The fence is reasonably permanent but may require maintenance in the future. A land use restriction would be necessary due to the presence of residual waste. The fencing is effective, implementable with local contractors, and economical. Site users and the community would reasonably accept fencing at this location due to its lack of visibility and exposure.

3.2 ALTERNATIVE 2: ON-SITE SLUDGE AND SOIL CAPPING AND RE-GRADING

The wastewater sludge inside the holding basin would be excavated and relocated to a "soil containment area" approximately 13 feet wide, 100 feet long and 1 foot deep on the north side of the holding basin. The silty clay liner in contact with the sludge would also be excavated and relocated. The clean sandy soils in the holding basin berm were tested during the Corrective Action Investigation, and were found to meet the DEC's residential soil standards. These soils are therefore considered reusable on the Site as a clean soil cap. The area would be re-graded to achieve the contours shown on the Alternative 2 drawing in Appendix A. The sludge would be buried a minimum of 18" with clean sandy soil from the holding basin berm. The rest of the lagoon footprint area would also be covered with minimum 18" clean sandy soil. Grass seed would be applied to the re-graded areas. The area could

potentially be used for other purposes, as long as the soil cap remains intact and undisturbed. Because the sludge would remain on Site, an environmental easement noting the presence of the sludge would be required to be included in the COC. The work would also include EP oversight, contract management, construction documentation and Brownfields Completion Reporting.

The budgetary cost estimate for Alternative 2 is $88,693. This estimate was generated using common contractor charges for mobilization, erosion control, and an allowance for oversight of the capping process.

The sludge and soil capping alternative is deemed protective of human health and the environment because the sludge and contaminated soil would be buried under a clean soil cap. This remedy complies with legal requirements, and is implemented at many Sites in Vermont. A land use restriction would be necessary in the Site's COC due to the residual waste. The soil cap is reasonably permanent but may require maintenance in the future. Soil capping is effective, implementable with local contractors, and economical. The excavation has to be done by a licensed waste contractor. It is believed Site users and the community would accept a soil cap at this location.

3.3 ALTERNATIVE 3: OFF-SITE SLUDGE AND SOIL DISPOSAL AND RE-GRADING

The wastewater sludge inside the holding basin may be considered hazardous due to its PFAs content. It would be excavated and removed from the Site. The silty clay liner in contact with the sludge would also be excavated and removed from the Site. The sludge would be loaded into rolloff containers and transported to a certified hazardous waste disposal facility for incineration. Confirmation soil sampling would be conducted to verify the complete removal of the sludge. The confirmation soil sampling would include metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl products (PCBs), dioxin and PFAs. An allowance for additional pre-disposal sludge disposal characterization testing is also included. Due to PCBs >1 ppm during Phase II ESA testing, a self-implementing cleanup plan (SICP) will be required for the cleanup. The SICP will include grid sampling and laboratory testing for PCBs of the soils below the holding basin lagoon, following removal of the sludge and liner. The clean sandy soils in the holding basin berm would be re-graded to achieve the contours shown on the drawing in Appendix A. The area would be usable for other purposes without regard to residual contamination. Because the sludge is being removed, no environmental easement would be necessary for this part of the Site.

The budgetary cost estimate for Alternative 3 is $488,831. This estimate was generated using common contractor charges for mobilization, erosion control, waste excavation, transport and disposal costs estimates, and an allowance for oversight of the capping process. Transportation and disposal costs were obtained from US Ecology, a licensed hazardous waste TSD contractor. LEE confirmed with

US Ecology during preparation of this ECAA update that the pricing remains valid. The US Ecology estimate is included in Appendix B. It includes an 11% Energy-Insurance-Security Recovery Fee that the waste vendor applies to subtotal charges.

Sludge and soil disposal is deemed protective of human health and the environment because the wastes will be transported to a certified off-Site disposal facility for incineration. This remedy complies with legal requirements and is a long-term permanent solution. No land use restriction would be necessary for the holding basin location, because the waste materials would be removed from the Site and the soil capping materials currently comprising the holding basin berm meet current residential soil standards. This remedy is effective in the shot term and in the long term. It is implementable by local contractors; the excavation, waste transport and disposal have to be done by a licensed waste contractor and a certified facility. The cost is the most expensive of the three alternatives. The environmental impact of the cleanup is higher than Alternatives 1 and 2, due to the amount of waste hauling that needs to take place, and the distances to certified waste facilities. It is believed that waste removal and Site users and the community will accept off-Site disposal.

4.0 EVALUATION OF CORRECTIVE ACTION ALTERNATIVES

Section 35-604(d) of the I-Rule indicates that each proposed cleanup alternative shall be evaluated for ten specific criteria, as outlined in Table 4-1. LEE has evaluated the proposed corrective action alternatives, using the following criteria established per the I-Rule. The results of the ranking are as follows. A higher score equates to a more advantageous outcome. LEE established the ranking criteria for each of the 10 specific criteria. The key attached to Table 4-1 explains how individual point scores were assigned.

Table 4-1: Summary of Corrective Action Alternatives Ranking

Criteria	Alternative 1 No Action/Fence	Alternative 2 Sludge Capping	Alternative 3 Sludge Disposal
1. Overall protection of human health and environment	3	5	5
2. Compliance with legal requirements	3	5	5
3. Long-term effectiveness and permanence	3	3	5
4. Land Use Restrictions	0	0	5
5. Reducing toxicity, mobility or volume	0	0	5
6. Short-term effectiveness	3	5	5
7. Implementability	5	5	5
8. Cost	5 ($16k)	3 ($87k)	0 ($489k)
9. Environmental impact and sustainability/resiliency	5	3	0
10. Community acceptance	3	5	5
Total ranking	30	34	40

Key

Criteria 1) Overall protection of human health and environment
0-ineffective protection of human health and environment
3-protective of human health or environment; may result in risk reduction
5-protective of both health and environment, highly effective

Criteria 2) Compliance with Legal Requirements
0-Clearly out of compliance with one or more legal requirements
3-uncertain legal status.
5-compliant with legal requirements based on experience

Criteria 3) Long-term effectiveness and permanence
0-ineffective and /or not permanent
3-somewhat effective or permanent, requires long-term oversight
5-highly effective and permanent based on experience

Criteria 4) Land use restriction
0-land use restriction required with inspections to verify system function
3-land use restriction required, no inspections necessary
5-no land use restriction required

Criteria 5) Reducing toxicity, mobility or volume through treatment
0-no waste treatment proposed and no treatment benefit
3- treatment proposed, uncertain treatment benefit.
5- treatment proposed that results in reduced toxicity, mobility or volume.

Criteria 6) Short-term effectiveness
0-ineffective immediately following implementation
3-somewhat effective immediately following implementation
5-highly effective immediately following implementation

Criteria 7) Implementability
0-difficult to implement using readily available technologies
3-possible to implement using technologies that may not be locally available
5-high likelihood of implementation using readily available local technologies

Criteria 8) Cost
0-highest predicted implementation costs
3-middle predicted implementation costs
5-lowest predicted installation

Criteria 9) Environmental impact and sustainability/climate change resiliency
0-highest negative impact on sustainability and climate change considerations
3-median or neutral impact on sustainability and climate change considerations
5-lowest negative impact on sustainability and climate change considerations

Criteria 10) Community acceptance
0-likely to be met with opposition by the local community
3-May be met with some opposition but other factors may compensate
5-unlikely to be met with opposition by the local community

5.0 RECOMMENDED CORRECTIVE ACTION ALTERNATIVE

Based on the evaluation of cleanup alternatives, , Alternative 3: Off-Site Sludge and Soil Disposal and Re-grading is recommended. This alternative is technically feasible, and results in no need for an environmental easement for residual sludge. It scores substantially higher than the next ranked alternative (Alternative 2: Sludge Capping) and has the advantage of removal of contamination from the Site. Alternative 3 appears to be economically feasible with respect to the Site's EPA Cleanup Grant ($489k estimated cost). LEE recommends that a CAP be developed incorporating Alternative 3 as its remediation strategy.

APPENDIX A

MAPS AND PLANS

Long Falls Paperboard

161 Wellington Road, Brattleboro, Vermont

LE Environmental

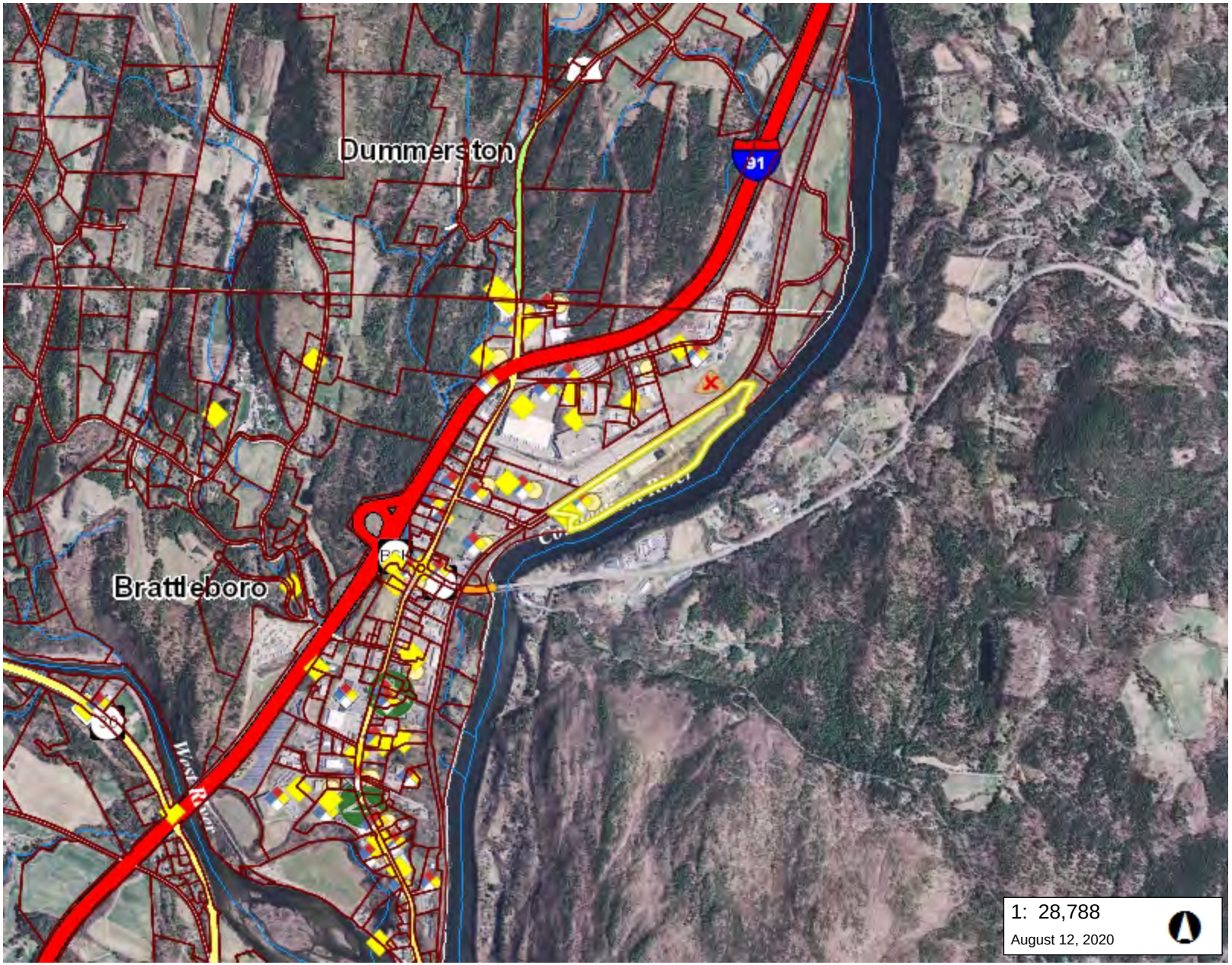
2018 USGS Map

LE #: 18-122
Date: March 16, 2020
Source: USGS Store

Natural Resources Atlas

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- Landfills
  - OPERATING
  - CLOSED
- Land Use Restrictions
  - Class IV GW Reclass
  - Class VI GW Reclass
  - Deed Restriction
  - Easement
  - Land Record Notice
  - Other
- Hazardous Site
- Hazardous Waste Generators
- Brownfields
- Salvage Yard
- Aboveground Storage Tank
- Underground Storage Tank (w
- Dry Cleaner
- Parcels (standardized)
- Parcels (non-standardized)
- Roads
  - Interstate
  - Principal Arterial
  - Minor Arterial
  - Major Collector
  - Minor Collector
  - Local
  - Not part of function Classification S

NOTES

Map created using ANR's Natural Resources Atlas

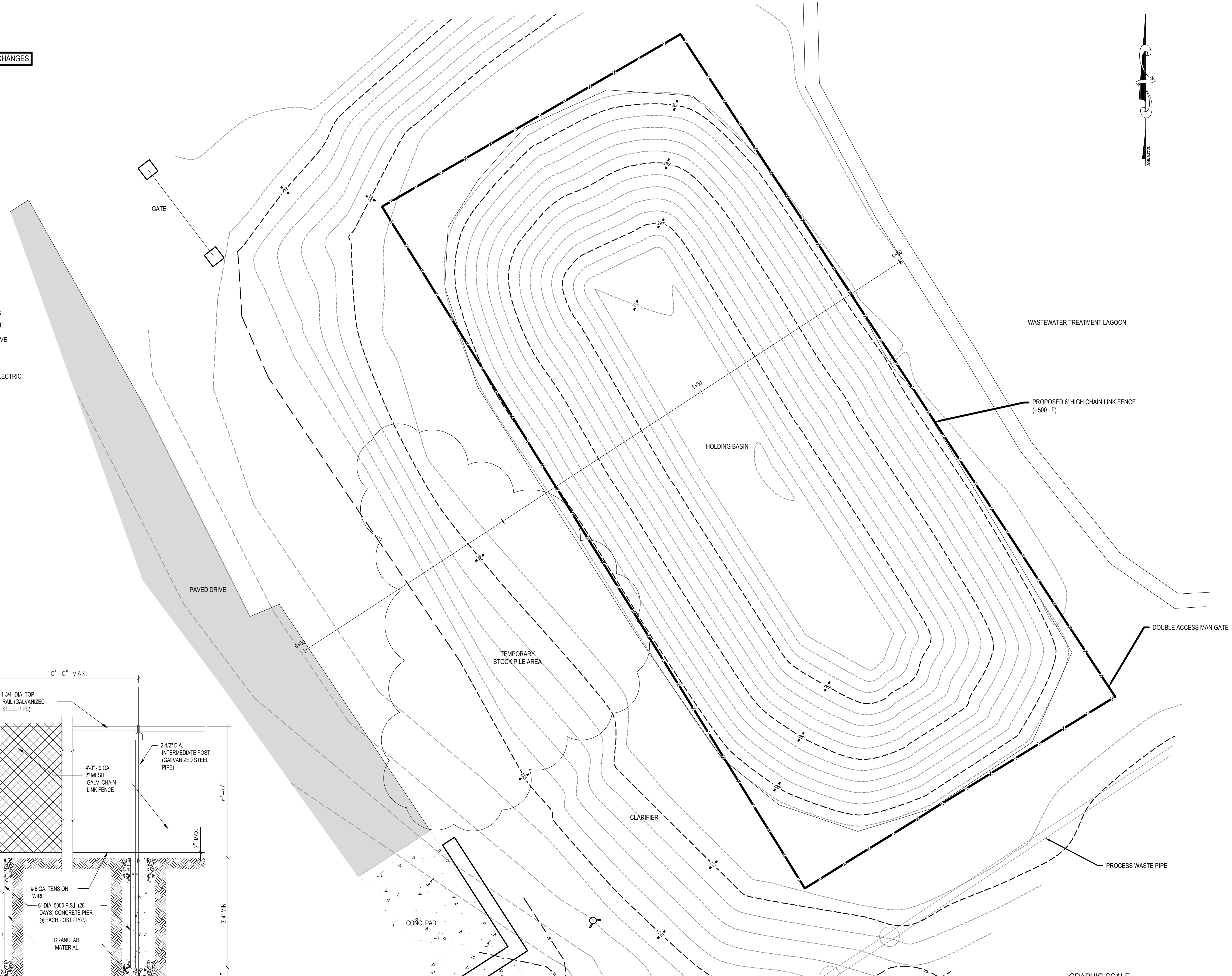
1,462.0 0 731.00 1,462.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2399 Ft. 1cm = 288 Meters

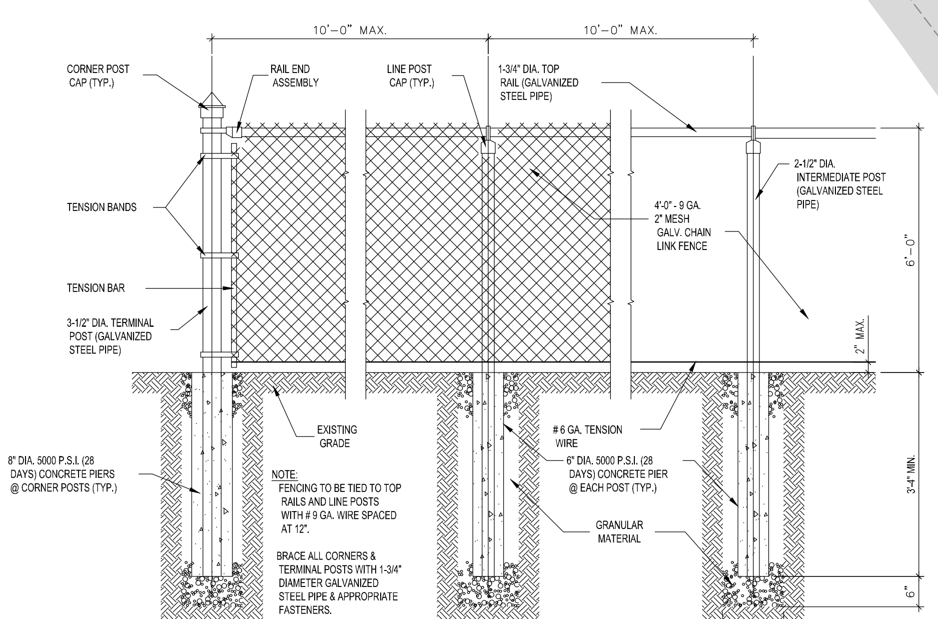
THIS MAP IS NOT TO BE USED FOR NAVIGATION

ALTERNATIVE #1: FENCE AROUND TOP OF HOLDING BASIN, NO OTHER CHANGES

Legend	
802'	INDEX CONTOUR
802	MINOR CONTOUR
	RAILROAD TRACKS
	PAVED ROAD/DRIVE
	GRAVEL ROAD/DRIVE
w	WATER
d	DRAIN
ue	UNDERGROUND ELECTRIC
gas	GAS
	HYDRANT
	MONITOR WELL



ALTERNATATIVE 1 SITE PLAN
SCALE: 1"=10'



CHAIN LINK FENCE DETAIL
SCALE: NONE

REV.	DATE	DESCRIPTION	BY

GREEN MOUNTAIN ENGINEERING
CIVIL
WATER
WASTEWATER
1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
PHONE: (802)862-5590
FAX: (802)862-7598

DRAWING TITLE: ALTERNATIVE 1
PROJECT: LONG FALL PAPER MILL LAGOON
CLIENT: LE ENVIRONMENTAL

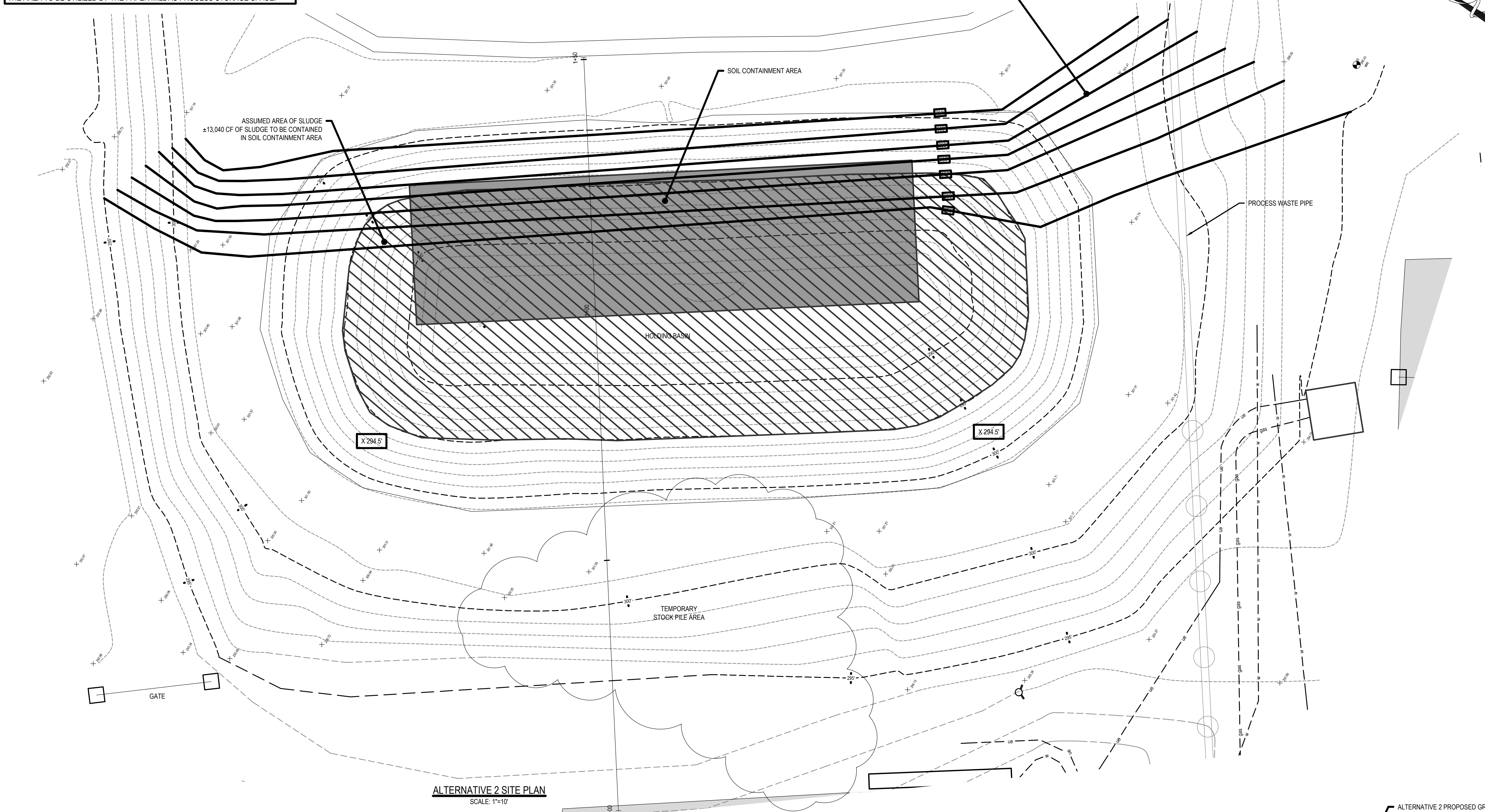
DESIGNED: AH	PLOT DATE: 9/21/20
DRAWN: JJB	SCALE: 1" = 10'
CHECKED: AH	DATE: AUG. 2020

PROJECT NO. 25-005.18

DRAWING NO. 1

FILE: S:\GME PROJECT FILES\25-000\25-005 LE ENVIRONMENTAL\25-005.18 BDSS LONG FALLS PAPER MILL\DRAWINGS\DESIGN BASE.DWG

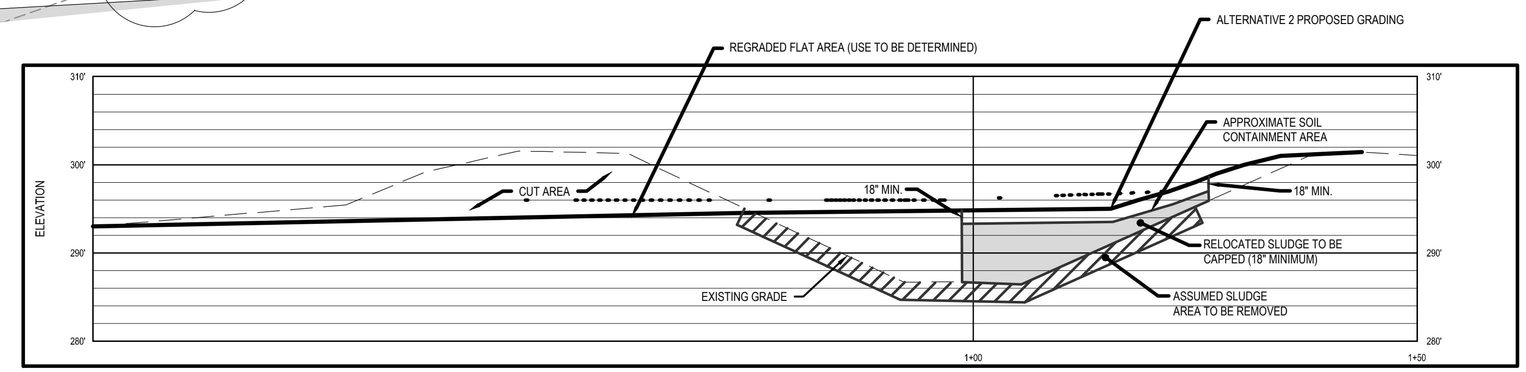
ALTERNATIVE #2: GRADE ACCESS WINDOW INTO THE HOLDING BASIN AS SHOWN TO GAIN ACCESS AND REMOVE 13,040 CF OF SLUDGE. ASSUMED SLUDGE EXTENDS TO 295' CONTOUR AND AND AVERAGE OF 2' DEEP. PLACE ±13,040 CF OF SLUDGE IN SOIL CONTAINMENT, AS SHOWN, WITH A MINIMUM OF 18" COVER (CLEAN FILL). USE REMAINING MATERIALS (FROM EARTHWORK) TO CAP SLUDGE AND REGRADE THE AREA TO BE UTILIZED BY THE PAPER MILL AS PROCESS STORAGE SPACE.



ALTERNATIVE 2 SITE PLAN
SCALE: 1"=10'

Symbol	Description
802'	INDEX CONTOUR
802'	MINOR CONTOUR
	RAILROAD TRACKS
	PAVED ROAD/DRIVE
	GRAVEL ROAD/DRIVE
w	WATER
d	DRAIN
ue	UNDERGROUND ELECTRIC
gas	GAS
	HYDRANT
	MONITOR WELL

GRAPHIC SCALE
(IN FEET)



ALTERNATIVE 2- SITE SECTION
H: 1"=10'
V: 1"=10'

REV.	DATE	DESCRIPTION	BY

1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
PHONE: (802)862-5590
FAX: (802)862-7598

GREEN MOUNTAIN ENGINEERING
CIVIL
WATER
WASTEWATER

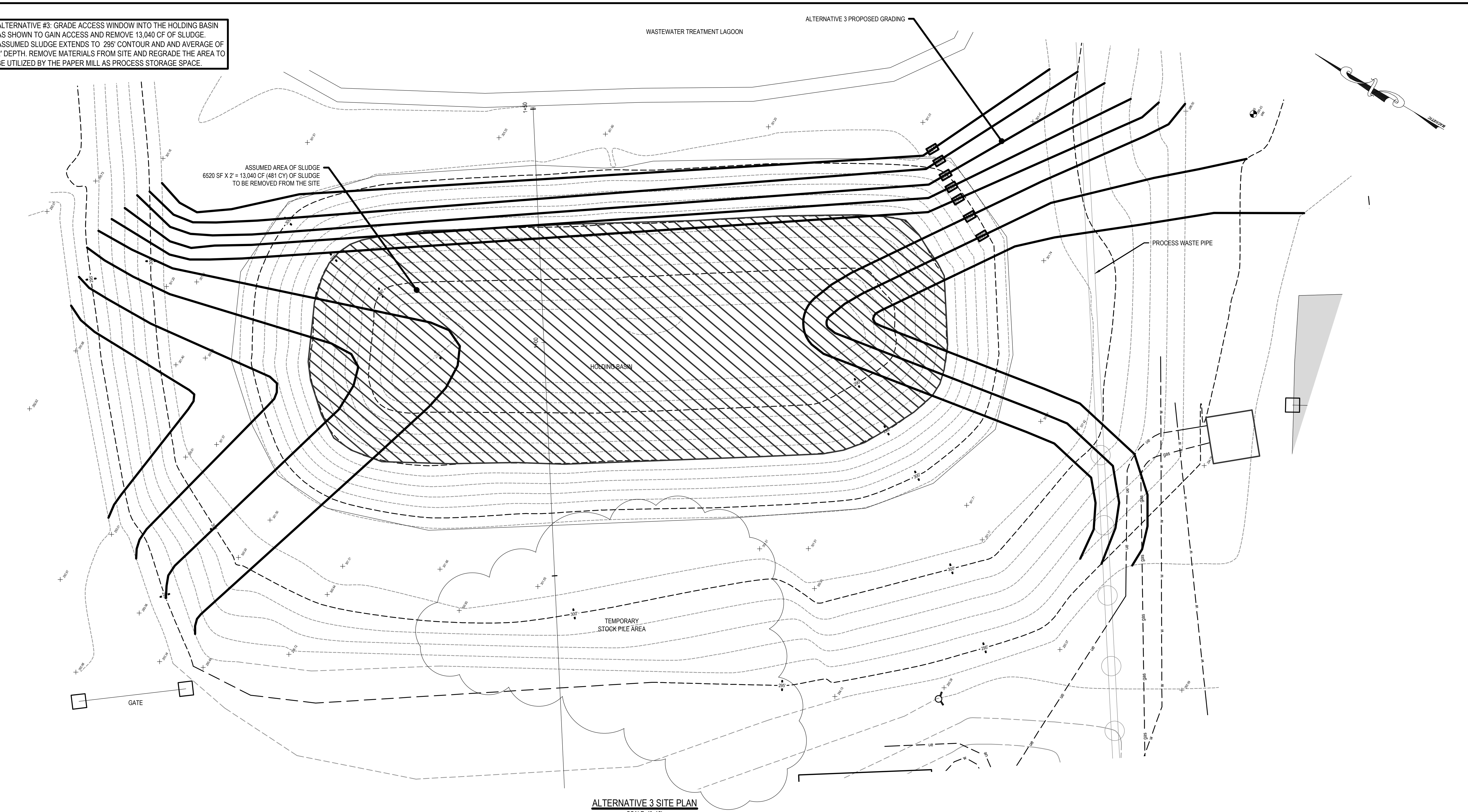
DRAWING TITLE: ALTERNATIVE 2
PROJECT: LONG FALL PAPER MILL LAGOON
CLIENT: LE ENVIRONMENTAL

DESIGNED: AH	PLOT DATE: 9/21/20
DRAWN: JJB	SCALE: 1" = 20'
CHECKED: AH	DATE: AUG. 2020

PROJECT NO. 25-005.18
DRAWING NO. 2

FILE: S:\GME PROJECT FILES\25-000\25-005 LE ENVIRONMENTAL\25-005.18 BDSS LONG FALLS PAPER MILL\DRAWINGS\DESIGN BASE.DWG

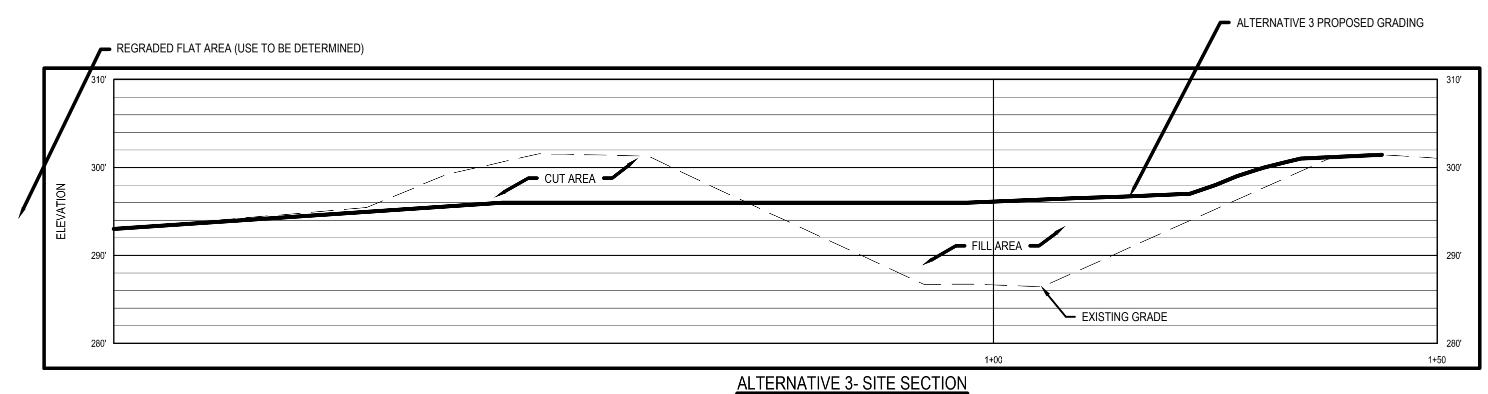
ALTERNATIVE #3: GRADE ACCESS WINDOW INTO THE HOLDING BASIN AS SHOWN TO GAIN ACCESS AND REMOVE 13,040 CF OF SLUDGE. ASSUMED SLUDGE EXTENDS TO 295' CONTOUR AND AND AVERAGE OF 2' DEPTH. REMOVE MATERIALS FROM SITE AND REGRADE THE AREA TO BE UTILIZED BY THE PAPER MILL AS PROCESS STORAGE SPACE.



ALTERNATIVE 3 SITE PLAN
SCALE: 1"=10'

802' (dashed)	INDEX CONTOUR
802' (dashed)	MINOR CONTOUR
	RAILROAD TRACKS
	PAVED ROAD/DRIVE
	GRAVEL ROAD/DRIVE
w	WATER
d	DRAIN
ue	UNDERGROUND ELECTRIC
gas	GAS
	HYDRANT
	MONITOR WELL

GRAPHIC SCALE
(IN FEET)



ALTERNATIVE 3- SITE SECTION
H: 1"=10'
V: 1"=10'

REV.	DATE	DESCRIPTION	BY

GREEN MOUNTAIN ENGINEERING
CIVIL
WATER
WASTEWATER
1438 SOUTH BROWNELL ROAD
WILLISTON, VERMONT 05495
PHONE: (802)862-5590
FAX: (802)862-7598

DRAWING TITLE: ALTERNATIVE 3
PROJECT: LONG FALL PAPER MILL LAGOON
CLIENT: LE ENVIRONMENTAL

DESIGNED: AH	PLOT DATE: 9/21/20
DRAWN: JJB	SCALE: 1" = 20'
CHECKED: AH	DATE: SEP. 2020

PROJECT NO. 25-005.18
DRAWING NO. 3

FILE: S:\GME PROJECT FILES\25-000\25-005 LE ENVIRONMENTAL\25-005.18 BDSS LONG FALLS PAPER MILL\DRAWINGS\DESIGN BASE.DWG

APPENDIX B

BUDGETARY COST ESTIMATES

Long Falls Paperboard Cost Estimate - Alternative 1
No Action Alternative/Install Fence
Brattleboro, Vermont
November 2020

Task	Category	Description	No.		Per Unit Cost	Unit	Item Cost	Markup Factor	Total Item Cost	**Subtotals**
1.0	**Fence Installation**									
	Mobilization / Demobilization	Expense	1	@	$500.00	/ls	$500.00	1.00	$500.00	
	Chain Link Fence - 6ft	Expense	500	@	$16.28	/lf	$8,140.00	1.00	$8,140.00	**$8,640**
2.0	**Oversight and Reporting**									
	Oversee Cleanup Plan Implementation	Expense	1	@	$800.00	/event	$800.00	1.00	$800.00	
	Archaeological Monitoring Allowance	Expense	0	@	$16,500.00	/event	$0.00	1.00	$0.00	
	Contractor Oversight/Cleanup Documentation	Expense	1	@	$2,000.00	/event	$2,000.00	1.00	$2,000.00	
	Brownfields Completion Reporting	Expense	1	@	$2,150.00	/report	$2,150.00	1.00	$2,150.00	**$4,950**

Cleanup Cost	**$13,590**
20% Contingency	**$2,718**
Total Cost For Project	**$16,308**

Long Falls Paperboard Cost Estimate - Alternative 2
Excavate Sludge, Cap on Site, and Regrade
Brattleboro, Vermont
November 2020

Task	Category	Description	No.		Per Unit Cost	Unit	Item Cost	Markup Factor	Total Item Cost	Subtotals
1.0	**Construction Costs / Characterization Sampling / Contaminated Soil Disposal**									
	Mobilization / Demobilization	Expense	1	@	$5,000.00	/ls	$5,000.00	1.00	$5,000.00	
	Soil Erosion Control	Contractor	1	@	$7,000.00	/ea	$7,000.00	1.00	$7,000.00	
	Common Excavation	Expense	5,574	@	$8.98	/cy	$50,054.52	1.00	$50,054.52	
	Seed	Expense	54	@	$14.00	/lb	$756.00	1.00	$756.00	
	Clean Soil Sampling	Expense	0	@	$1,000.00	/ea	$0.00	1.00	$0.00	
	Characterization Sampling	Expense	0	@	$1,000.00	/ea	$0.00	1.00	$0.00	**$62,811**
2.0	**Oversight and Reporting**									
	Oversee Cleanup Plan Implementation	Expense	3	@	$800.00	/event	$2,400.00	1.00	$2,400.00	
	Archaeological Monitoring Allowance	Expense	0	@	$16,500.00	/event	$0.00	1.00	$0.00	
	Contractor Oversight/Cleanup Documentation	Expense	1	@	$6,550.00	/event	$6,550.00	1.00	$6,550.00	
	Brownfields Completion Reporting	Expense	1	@	$2,150.00	/report	$2,150.00	1.00	$2,150.00	**$11,100**

Total Cost For Project	**$73,911**
20% Contingency	**$14,782**
Total Cost For Project	**$88,693**

Long Falls Paperboard Cost Estimate - Alternative 3
Excavate Sludge and Remove fron Site, Regrade Site
Brattleboro, Vermont
November 2020

Task	Category	Description	No.		Per Unit Cost	Unit	Item Cost	Markup Factor	Total Item Cost	**Subtotals**
1.0	**Construction Costs**									
	Mobilization / Demobilization	Expense	1	@	$5,000.00	/ls	$5,000.00	1.00	$5,000.00	
	Soil Erosion Control	Contractor	1	@	$7,000.00	/ea	$7,000.00	1.00	$7,000.00	
	Common Excavation	Expense	5,574	@	$8.98	/cy	$50,054.52	1.00	$50,054.52	
	Seed	Expense	54	@	$14.00	/lb	$756.00	1.00	$756.00	
	Characterization Sampling	Expense	4	@	$1,500.00	/ea	$6,000.00	1.00	$6,000.00	
	Confirmation Sampling and SICP	Expense	1	@	$6,000.00	/ea	$6,000.00	1.00	$6,000.00	
	Sludge Disposal - Rolloff Delivery	Expense	17	@	$1,000.00	/ea	$17,000.00	1.00	$17,000.00	
	Sludge Disposal-Rolloff Rental	Expense	17	@	$30.00	/day	$510.00	1.00	$510.00	
	Sludge Disposal-Delivery to End Facility	Expense	17	@	$6,750.00	/ea	$114,750.00	1.00	$114,750.00	
	Sludge Disposal-Rolloff Liners	Expense	17	@	$75.00	/ea	$1,275.00	1.00	$1,275.00	
	Sludge Disposal Fee	Expense	750	@	$210.00	/ton	$157,500.00	1.00	$157,500.00	
	ESIC Fee	Expense	0.11	@	$291,035.00	/subtotal	$32,013.85	1.00	$32,013.85	**$397,859**
2.0	**Oversight and Reporting**									
	Oversee Cleanup Plan Implementation	Expense	1	@	$800.00	/event	$800.00	1.00	$800.00	
	Archaeological Monitoring Allowance	Expense	0	@	$16,500.00	/event	$0.00	1.00	$0.00	
	Contractor Oversight/Cleanup Documentation	Expense	1	@	$6,550.00	/event	$6,550.00	1.00	$6,550.00	
	Brownfields Completion Reporting	Expense	1	@	$2,150.00	/report	$2,150.00	1.00	$2,150.00	**$9,500**

Assumes 500 cubic yards sludge disposal into 30 cubic yard rolloffs.

Total Cost For Project	**$407,359**
20% Contingency	**$81,472**
Total Cost For Project	**$488,831**

APPENDIX C

SOILS DATA WITH RESIDENTIAL SOIL STANDARDS

Brownfields Cleanup Site Investigation
Soil Data Summary
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont

Sample Identification	*LF-5*	*LF-6*	*LF-7*	*EPA Residential RSL*	*EPA Industrial RSL*	*VSS Residential*	*VSS Non-Residential*
Sample Depth (ft. bg)	*0-18"*	*0-18"*	*0-18"*				
PID Reading (ppm)	*0.1*	*0.0*	*0.0*				
Sample Date	*5/8/20*						
VOCs, EPA Method 8260C (mg/kg)							
Acetone	ND<0.090	ND<0.087	ND<0.076	-	-	40,609	100,028
Acrylonitrile	ND<0.0054	ND<0.0052	ND<0.0045	0.25	1.1		-
tert-Amyl Methyl Ether (TAME)	ND<0.00090	ND<0.00087	ND<0.00076	-	-		-
Benzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	0.7	4.2
Bromobenzene	ND<0.0018	ND<0.0017	ND<0.0015	290	1,800		-
Bromochloromethane	ND<0.0018	ND<0.0017	ND<0.0015	-	-	193	597
Bromodichloromethane	ND<0.0018	ND<0.0017	ND<0.0015	0.29	1.3		-
Bromoform	ND<0.0018	ND<0.0017	ND<0.0015	19	86		-
Bromomethane	ND<0.0090	ND<0.0087	ND<0.0076	6.8	30		-
2-Butanone (MEK)	ND<0.036	ND<0.035	ND<0.030	-	-	16,952	26,991
tert-Butyl Alcohol (TBA)	ND<0.036	ND<0.035	ND<0.030	-	-		-
n-Butylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	3,504	51,100
sec-Butylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	7,009	102,200
tert-Butylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	7,009	102,200
tert-Butyl Ethyl Ether (TBEE)	ND<0.00090	ND<0.00087	ND<0.00076	-	-		-
Carbon disulfide	ND<0.0054	ND<0.0052	ND<0.0045	-	-	608	662
Carbon tetrachloride	ND<0.0018	ND<0.0017	ND<0.0015	-	-	0.37	2.2
Chlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	414	726
Chlorodibromomethane (Dibromochloromethane)	ND<0.00090	ND<0.00087	ND<0.00076	8.3	39		-
Chloroethane (ethyl chloride)	ND<0.0018	ND<0.0017	ND<0.0015	14,000	57,000		-
Chloroform	ND<0.0036	ND<0.0035	ND<0.0030	0.32	1.4		-
Chloromethane	ND<0.0090	ND<0.0087	ND<0.0076	110	460		-
2-Chlorotoluene	ND<0.0018	ND<0.0017	ND<0.0015	1,600	23,000		-
4-Chlorotoluene	ND<0.0018	ND<0.0017	ND<0.0015	1,600	23,000		-
1,2-Dibromo-3-chloropropane (DBCP)	ND<0.0018	ND<0.0017	ND<0.0015	0.0053	0.064		-
1,2-Dibromoethane(EDB)	ND<0.00090	ND<0.00087	ND<0.00076	-	-	0.02	0.14
Dibromomethane	ND<0.0018	ND<0.0017	ND<0.0015	24	99		-
1,2-Dichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	1,800	9,300		-
1,3-Dichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-
1,4-Dichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	2.6	11		-
trans-1,4-Dichloro-2-butene	ND<0.0036	ND<0.0035	ND<0.0030	0.0074	0.032		-
Dichlorodifluoromethane (Freon 12)	ND<0.018	ND<0.017	ND<0.015	87	370		-
1,1-Dichloroethane	ND<0.0018	ND<0.0017	ND<0.0015	-	-	2.1	13
1,2-Dichloroethane	ND<0.0018	ND<0.0017	ND<0.0015	-	-	0.29	1.7
1 ,1-Dichloroethene	ND<0.0036	ND<0.0035	ND<0.0030	230	1,000		-
cis-1,2-Dichloroethene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	140	1,814
trans-1,2-Dichloroethene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	1,402	18,137
1,2-Dichloropropane	ND<0.0018	ND<0.0017	ND<0.0015	-	-	1.5	9.1
1,3-Dichloropropane	ND<0.00090	ND<0.00087	ND<0.0007 6	1,600	23,000		-
2,2-Dichloropropane	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-

NOTES:
Vermont Soil Standards (VSS) and Statewide Background Concentrations from July 2019 DEC I-Rule
EPA Regional Screening Levels (RSLs) from May 2020 RSL Summary Table. RSLs not included when a VSS exists.
Reported results or reporting limits equal to or in excess of residential soil thresholds are shaded.
Blank Cell=no published value (VSS) or published value not applicable (RSL)

Brownfields Cleanup Site Investigation
Analytical Sensitivity and Project Criteria (Form K) Tables
Long Falls Paperboard
161 Wellington Road, Brattleboro, Vermont

Sample Identification	*LF-5*	*LF-6*	*LF-7*	*EPA Residential RSL*	*EPA Industrial RSL*	*VSS Residential*	*VSS Non-Residential*
Sample Depth (ft. bg)	*0-18"*	*0-18"*	*0-18"*				
PID Reading (ppm)	*0.1*	*0.0*	*0.0*				
Sample Date		*5/8/20*					
VOCs, EPA Method 8260C (mg/kg)							
1 ,1-Dichloropropene	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-
cis-1,3-Dichloropropene	ND<0.00090	ND<0.00087	ND<0.00076	1.8	8.2		-
trans-1,3-Dichloropropene	ND<0.00090	ND<0.00087	ND<0.00076	1.8	8.2		-
Diethyl Ether	ND<0.018	ND<0.0017	ND<0.0015	-	-		-
Diisopropyl Ether (DIPE)	ND<0.00090	ND<0.00087	ND<0.00076	2200	9400		-
1,4-Dioxane	ND<0.090	ND<0.087	ND<0.076	5.3	17		
Ethylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	3.7	22
Hexachlorobutadiene	ND<0.0018	ND<0.0017	ND<0.0015	1.2	5.3		-
2-Hexanone (MBK)	ND<0.018	ND<0.017	ND<0.015	200	1,300		-
IsoPropylbenzene (cumene)	ND<0.0018	ND<0.0017	ND<0.0015	-	-	256	264
p-Isopropyltoluene (p-cymene)	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-
Methyl Acetate	ND<0.0018	ND<0.0017	ND<0.0015	78,000	1,200,000		-
MTBE	ND<0.0036	ND<0.0035	ND<0.0030	-	-	649	4,464
Methyl Cyclohexane	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-
Methylene chloride	ND<0.018	ND<0.017	ND<0.015	57	1,000		-
4-Methyl-2-pentanone(MIBK)	ND<0.018	ND<0.017	ND<0.015	33,000	140,000		-
Naphthalene	ND<0.0036	ND<0.0035	ND<0.0030	-	-	2.7	16
n-Propylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	253	261
Styrene	ND<0.0018	ND<0.0017	ND<0.0015	6,000	35,000		-
1,1,1,2-Tetrachloroethane	ND<0.0018	ND<0.0017	ND<0.0015	2	8.8		-
1,1,2,2-Tetrachloroethane	ND<0.00090	ND<0.00087	ND<0.00076	0.6	2.7		-
Tetrachloroethene (PCE)	ND<0.0018	ND<0.0017	ND<0.0015	-	-	2.4	14
Tetrahydrofuran(THF)	ND<0.0090	ND<0.0087	ND<0.0076	-	-		-
Toluene	ND<0.0018	**0.0025**	ND<0.0015	-	-	706	798
1,2,3-Trichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	63	930		-
1,2,4-Trichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	24	110		-
1,3,5-Trichlorobenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-		-
1,1,1-Trichloroethane	ND<0.0018	ND<0.0017	ND<0.0015	8,100	36,000		-
1,1,2-Trichloroethane	ND<0.0018	ND<0.0017	ND<0.0015	0.94	5		-
Trichloroethene (TCE)	ND<0.0018	ND<0.0017	ND<0.0015	-	-	0.68	6.5
Trichlorofluoromethane (Freon 11)	ND<0.0090	ND<0.00087	ND<0.0076	23,000	350,000		-
1,2,3-Trichloropropane	ND<0.0018	ND<0.0017	ND<0.0015	-	-	0.00311	0.07
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND<0.0090	ND<0.0087	ND<0.0076	-	-		-
1,2,4-trimethylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	144*	177*
1,3,5-trimethylbenzene	ND<0.0018	ND<0.0017	ND<0.0015	-	-	144*	177*
Vinyl Chloride	ND<0.0090	ND<0.0087	ND<0.0076	-	-	0.10	0.59
mp-Xylene	ND<0.0036	ND<0.0035	ND<0.0030	-	-	252	257
o-Xylene	ND<0.0018	ND<0.0017	ND<0.0015	-	-		

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Sample Depth (ft. bg)	*0-18"*	*0-18"*	*0-18"*				
PID Reading (ppm)	*0.1*	*0.0*	*0.0*				
Sample Date	*5/8/20*						
PAH EPA Method 8270D (mg/kg)							
Acenaphthene	ND<0.19	ND<0.19	ND<0.19	3,600	45,000		-
Acenaphthylene	ND<0.19	ND<0.19	ND<0.19	-	-		-
Anthracene	ND<0.19	ND<0.19	ND<0.19	18,000	230,000		-
Benzo(a)anthracene	ND<0.19	ND<0.19	ND<0.19	1.1	21		-
Benzo(a)pyrene	ND<0.19	ND<0.19	ND<0.19			0.07	1.54
Benzo(b)fluoranthene	ND<0.19	ND<0.19	ND<0.19	1.1	21		-
Benzo(g,h,i)perylene	ND<0.19	ND<0.19	ND<0.19	-	-		-
Benzo(k)fluoranthene	ND<0.19	ND<0.19	ND<0.19	11	210		-
Chrysene	ND<0.19	ND<0.19	ND<0.19	110	2,100		-
Dibenz(a,h)anthracene	ND<0.19	ND<0.19	ND<0.19	0.1	2.1		-
Fluoranthene	ND<0.19	ND<0.19	ND<0.19	-	-		26,371
Fluorene	ND<0.19	ND<0.19	ND<0.19	-	-		26,371
Indeno(1,2,3-cd)pyrene	ND<0.19	ND<0.19	ND<0.19	1.1	21		-
2-Methylnaphthalene	ND<0.19	ND<0.19	ND<0.19	240	3,000		-
Naphthalene	ND<0.19	ND<0.19	ND<0.19	-	-		16
Phenanthrene	ND<0.19	ND<0.19	ND<0.19	-	-		-
Pyrene	ND<0.19	ND<0.19	ND<0.19	1,800	23,000		-
PAH TEQ as B[a]P	0.22	0.22	0.22	-		0.07	0.58
POLYCHLORINATED DIOXIN AND FURAN (ng/kg, as TEQ)							
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-TCDD)	**0.56**	**1.54**	**1.33**	-		2.25	13.7
TOTAL METALS, EPA Method 6020 (mg/kg, dry)							
Total Arsenic	**5.8**	**5.9**	**6.5**	-	-	16	16
Total Barium	**29**	**32**	**27**	-	-	11,247	127,382
Total Cadmium	ND<0.37	ND<0.38	ND<0.36	-	-	6.9	87
Total Chromium	**13**	**15**	**13**	-	-	40,223	360,223
Total Lead	**7.8**	**6.1**	**5.1**	-	-	400	800
Total Mercury	**0.037**	ND<0.027	ND<0.026	-	-	3.1	3.1
Total Selenium	ND<3.7	ND<3.8	ND<3.6	390	5,800		-
Total Silver	ND<0.37	ND<0.38	ND<0.36	-	-	237	2,483
PCBS, EPA Method 8082 (mg/kg, dry)							
Aroclor-1016	ND<0.091	ND<0.091	ND<0.087	4.1	27		-
Aroclor-1221	ND<0.091	ND<0.091	ND<0.087	0.20	0.83		-
Aroclor-1232	ND<0.091	ND<0.091	ND<0.087	0.17	0.72		-
Aroclor-1242	ND<0.091	ND<0.091	ND<0.087	0.23	0.95		
Aroclor-1248	ND<0.091	ND<0.091	ND<0.087	0.23	0.95		-
Aroclor-1254	ND<0.091	ND<0.091	ND<0.087	0.24	0.97		-
Aroclor-1260	ND<0.091	ND<0.091	ND<0.087	0.24	0.99		-
Aroclor-1262	ND<0.091	ND<0.091	ND<0.087	-	-		-
Aroclor-1268	ND<0.091	ND<0.091	ND<0.087	-			-
Total PCBs	ND	ND	ND	-		0.114	0.68

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